

ADDENDUM #1
INVITATION FOR BIDS S-03
2016 PAVING PROGRAM
AUGUST 1, 2016

The bid due date has been changed from August 4, 2016 at 2:00 PM to **August 4, 2016 at 3:00 PM.**

Attached please find Item Specifications.

TECHNICAL SPECIFICATOINS

ITEM 120.1**UNCLASSIFIED EXCAVATION****CUBIC YARD****DESCRIPTION:**

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

Work under this item includes excavation of all materials obstructing execution of the required work as shown on the plans or as directed. Also included shall be the removal and disposal of all other materials not designated to be reused on the project. The Engineer shall determine the disposition of all materials with respect to removal and disposal.

CONSTRUCTION METHODS:

Edges of excavations made in existing pavements shall be squared by sawcutting with power-driven tools to provide a neat, clean edge for joining new pavement. Ragged, uneven edges shall not be acceptable. Pavement areas which have been broken or undermined shall be edged neatly with minimum disturbance to remaining pavement. Payment for sawcutting shall be made under Item 482.3.

Foundations left in place under roadway surface shall be removed to a depth of 3 feet; all other foundations left in place shall be removed to a depth of 12 inches below the finished grade. The area shall be restored to match the existing or proposed grade with materials similar in kind to the abutting materials and will be paid for under the pertinent pavement items.

Before starting excavation, the Contractor shall field check and verify all the vaults, septic systems, sprinkler systems, and other structures in the project area and make sure that the excavation will not disturb or damage such structures. He will coordinate his construction activities with the owners of such structures and obtain approval or permits, if necessary, prior to starting the excavation. Any damage done to these structures during the construction process will be the responsibility of the Contractor and will be repaired by the Contractor at his own expense. If the owner so wishes, he will repair the damage himself and bill the Contractor for his expenses.

When working next to existing retaining walls, the Contractor shall exercise extreme caution not to disturb existing walls. If existing walls are disturbed, they shall be reconstructed at the Contractor's expense to thoroughly match the existing wall in color, texture, material and workmanship.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT:

Unclassified excavation will be measured for payment by the cubic yard.

Unclassified excavation will be paid for at the Contract unit price per cubic yard, which price shall include all labor, materials, equipment and incidental costs required to complete the work.

DESCRIPTION:

The scope of this work is to prepare the surface by way of cold planing. The surface will be ready to accept a new wearing course of asphalt pavement materials. The foundation surface shall be cold planed to the proper grade as directed by the Engineer. The planed surface shall provide a smooth riding surface free from gouges, continuous grooves, ridges, oil film and other imperfections of workmanship and shall have a uniform surface appearance.

REFERENCES:

Materials and construction methods shall conform, insofar as applicable, to the requirements of the Massachusetts Standard Specifications for Highways and Bridges, dated 1988, together with all errata addenda, additional revisions, and supplemental specifications, all of which are hereinafter referred to as the Massachusetts Standard Specifications.

MATERIALS:

Material for this work shall conform to the requirements of Section 120 of the Massachusetts Standard Specifications.

CONSTRUCTION METHODS:

The asphalt surface being planed and profiled shall be removed to a depth, width, grade and cross-section as directed by the Engineer.

The loose material resulting from the operation shall become the property of the Contractor and disposed of at a Contractor-furnished disposal site.

The equipment for planing and profiling of pavement surface shall be a power-operated, track-propelled planing machine or a grinder capable of removing, in one pass, a layer of asphalt material 9 feet in width, with a minimum depth of cut equal to 2 inches or a thickness of asphalt concrete necessary to provide profile, cross slope and desired surface uniformly across the entire pavement surface.

The equipment shall be self-propelled with sufficient power, traction and stability to maintain accurate depth of cut and slope. The equipment shall be capable of accurately and automatically establishing profile grades along each edge of the machine (within 1/8-inch more or less) by referencing from the existing pavement by means of a ski or matching shoe controlling cross slope at a given rate.

The machine shall be equipped with an integral loading and reclaiming means to immediately remove material being cut from the surface of the roadway and discharge the cuttings into a truck, all in one operation. All planing machinery shall be equipped with dust control devices to prevent any dust produced in the cutting operation from escaping into the air. This machine shall

be equipped with a floating moldboard cutting device which is behind the mandrel and such moldboard must have an infinitely variable down pressure from 0-300 P.S.I.

The Contractor shall also have the necessary auxiliary grinding or milling machinery to perform the required curb cutting and trim cutting to reduce the amount of hand labor necessary to prepare the roadway foundation.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT:

The quantity of pavement milling to be paid for under these Items shall be equal to the actual area cold planed, measured by the square yard, complete as indicated on the Drawings or as otherwise directed by the Engineer.

Payment for work completed shall be at the contract unit price bid per square yard and shall include full compensation for all tools, machines and labor necessary for cold planning to the required depth from curb line to curb line and removal of asphalt cuttings, cutting all edges at limit of work and in front of curbs, berms, and at gutter lines; excavating around all utility castings in the roadway, mechanical sweeping of the entire road area to remove all remaining asphalt cuttings and debris, and all other work necessary to complete the work in a satisfactory manner

DESCRIPTION:

This item of work shall consist of furnishing and placing gravel borrow.

REFERENCES:

Materials and construction methods shall conform, insofar as applicable, to the requirements of the Massachusetts Standard Specifications for Highways and Bridges, dated 1988, together with all errata addenda, additional revisions, and supplemental specifications, all of which are hereinafter referred to as the Massachusetts Standard Specifications.

MATERIALS:

Gravel Borrow shall conform to the relevant provisions of Section 150, Embankment, of the Standard Specifications and the following special provisions.

All materials used for sidewalks shall conform to the requirements of Subsection M1.03.0, Type b.

All materials shall be placed and compacted as specified, and as directed by the Engineer.

METHODS OF MEASUREMENT AND BASIS OF PAYMENT:

Gravel Borrow will be measured by the actual number of cubic yards placed. Payment for work completed shall be at the contract unit price bid per cubic yards within the limits of work. Payment shall also include full compensation for all tools, machines and labor, and all other work necessary to complete the work in a satisfactory manner.

ITEM 156**CRUSHED STONE****TON**

Work under this Item shall conform to the relevant provisions of Section 150 "Embankment", of the Standard Specifications and the following:

The Work under this item shall include the provision, placement and compaction of crushed stone at locations where shown on the Plans or when directed by the Owner.

Crushed Stone shall conform to Subsection M2.01.4 of Division III, Materials of the Standard Specifications.

Preparation and installation of Gravel Borrow shall be in accordance with the appropriate Subsection of Section 150.6 of the Standard Specifications.

Crushed Stone shall be paid for at the unit bid price per ton in place complete. No additional compensation shall be made for the placement and compaction of crushed stone in small and isolated quantities.

ITEM 170

FINE GRADING AND COMPACTING

SQUARE YARD

Work under this Item shall conform to the relevant provisions of Section 170 "Grading" of the Standard Specifications and the following:

In addition to those areas defined in the Standard Specifications, work under this Item shall include fine grading and compacting of subgrade areas at driveway and parking lot full depth construction locations, in areas of sidewalk and wheelchair ramp construction, in adjacent areas where existing curb is removed and reset, in adjacent areas where new curb is installed, in landscape areas where existing pavement is to be removed and replaced with loam and seed, and as directed by the Owner.

Payment under this item shall be in accordance with Subsection 170.81 of the Standard Specifications.

ITEM 201.00 – CATCH BASIN – MUNICIPAL STANDARD

EACH

The work under this item shall conform to the relevant requirements of Section 201 of the Standard Specifications and the following:

This work shall consist of supplying materials for and the installation of catch basins (including trap, concrete collar, and catch basin hood) at the locations shown on the plans and as detailed on the plans. The catch basin shall have a four foot (4') sump as detailed on the plans.

Catch Basin shall be measured by each structure installed, complete in place, regardless of depth.

No separate payment will be made for the trap, including the collar, or the hood required for the Catch Basin. All costs associated with furnishing and installing the trap, collar or hood shall be considered incidental to the item.

Catch Basin shall be paid for at the contract unit price bid per each, which price shall constitute full and complete compensation for all excavation, disposal of material, backfill, bedding material, structure, and all labor, materials, equipment and incidental costs required to complete the work.

ITEM 220.

DRAINAGE STRUCTURE ADJUSTED

EACH

ITEM 220.7

SANITARY STRUCTURE ADJUSTED

EACH

Work under these Items shall conform to the relevant provisions of Section 220 and shall be applicable to all types of municipal structures, including drainage and sanitary structures.

The frames and covers shall not be adjusted upward until after placement of the binder course, but before placement of the wearing course.

Manhole frames shall be set with the tops conforming accurately to the grade of the pavement or finished ground surface or as indicated on the drawings or directed. Frames shall be set concentric with the top of the masonry and in full bed of mortar so that the space between the top of the manhole masonry and the bottom flange of the frame shall be completely filled and made watertight. A thick ring of mortar extending to the outer edge of the masonry shall be placed all around and on the top of the bottom flange. The mortar shall be smoothly finished and have a slight slope to shed water away from the frame.

During the work, the contractor shall take measures to assure that construction materials and debris do not enter the structure. At the completion of the work the connecting sewer/drain lines shall be inspected and debris associated with the work shall be removed and disposed.

Use of steel plates to cover open structures shall be considered incidental to the work and not cause for additional compensation. Multiple adjustments or remodeling that may be necessary as a result of the work sequence shall be considered part of the one-time measurement and payment and not cause for additional compensation.

Salvageable frames and grates or covers from existing structures to be removed shall be removed and reset to proposed structures as directed by the Engineer or, if not needed, shall be removed and stacked at the DPW yard. Nonsalvageable frames and grates or covers from existing drainage structures to be removed shall become the property of the Contractor and shall be disposed of off the site.

Structure adjusted shall be measured per unit structure adjusted. This item shall be paid for at the contract unit price bid per drainage or sanitary manhole frame and cover adjusted, which price shall constitute full and complete compensation for all materials, bricks, removing, stacking, storing and resetting castings, for all excavation and backfill, equipment, tools, labor and incidentals required to finish the work of this item to the satisfaction of the Engineer. No separate payment will be made for cleaning of structure and associated lines, but all costs in connection therewith shall be included in the unit price bid for this item.

New frame and grate or cover shall be paid for under Item 222.3.

ITEM 220.2 – DRAINAGE STRUCTURE REBUILT

VERTICAL FOOT

The work under this item shall conform to the relevant provisions of Section 220 of the Standard Specifications and the following:

The work under this item shall consist of reconstructing existing catch basins or manholes as indicated on the plans or as directed by the Engineer. Work shall consist of removing and stockpiling the existing castings, removing a portion of the existing structure and constructing a new structure in conformity with the lines, grades, dimensions and details on the plans.

Existing castings shall be reset on each catch basin after the reconstruction. The walls of the existing structures shall be removed to a depth necessary to make the transition to the required lines, grade and dimensions of the reconstructed catch basin as shown on the plans or as directed by the Engineer. Any excavation required around the structure shall be done in a manner to cause the least disturbance to the surrounding area. When the mortar has set, the backfill shall be compacted to 95% density as defined in AASHTO-180, Method A or D.

This item shall be paid for at the contract unit price bid per vertical foot measured in tenths of a foot from the bottom of rebuilt masonry to the bottom of the casting, which price shall constitute full and complete compensation for all materials, bricks or concrete blocks, removing, stacking, storing and resetting castings, removing and disposing existing walls, constructing new walls, for all excavation and backfill, any sawcutting, equipment, tools, labor and incidentals required to finish the work of this item to the satisfaction of the Engineer. No separate payment will be made for cleaning of structures.

ITEM 220.3 – DRAINAGE STRUCTURE CHANGE IN TYPE

EACH

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

Frames and grates or covers from existing structures shown on the drawings to be changed in type, shall be removed and stacked in the City of Taunton DPW Yard at 90 Ingell Street, unless, in the judgment of the Engineer, they are unsuitable for reuse. Unsuitable frames, grates and covers shall become the property of the Contractor and shall be disposed of off the site at no additional cost to the Department. New frames, grates and covers shall be furnished and installed to supplement the reused frames, grates and covers, and shall be paid for under the appropriate items for frames and grates or frames and covers.

The work shall include cleaning drainage structures of any accumulation of silt, debris, or foreign matter of any kind. No separate payment will be made for cleaning of drainage structures, but all costs in connection therewith shall be included in the Contract unit price for drainage structures change in type.

ITEM 222.3

FRAME AND GRATE (OR COVER)
MUNICIPAL STANDARD

EACH

The work of this Item shall conform to the relevant provisions of Section 200 of the Standard Specifications and the following:

Frames, grates, and covers shall be of good quality, strong, tough, even grained cast iron smooth, free from scale, lumps, blisters, sand holes and defects of any kind which render them unfit for the service for which they are intended. Grates, covers, and frame seats shall be machined to a true surface. Castings shall be thoroughly cleaned and subject to hammer inspection.

Manhole covers shall have a diamond pattern, pickholes and the appropriate word "DRAIN" or "SEWER" cast in 3 inch letters. Frames and covers shall be per municipal standard.

Casting frames shall be set in a full mortar bed with clay bricks (maximum height 8 inches) Use of cement concrete brick will not be allowed. Castings shall be set to line and grade and secured with a concrete collar that is overlaid with a minimum of two inches of Hot Mix Asphalt top course. Castings shall be set 1-inch lower than finish grade in pavement areas and 1" higher than the adjacent low side grade in roadside swale area.

Compensation for this work shall be at the Contract Unit price bid for Each, which price shall include all labor, tools, material and necessary incidental expenses.

ITEM 241.12 – 12 INCH REINFORCED CONCRETE PIPE

FOOT

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

The proposed pipe end shall be set or cut off flush with the inside face of the proposed structure wall and the remaining space around the pipe completely filled with cement grout for the full thickness of the structure wall.

No separate payment will be made for excavation, the cost of connecting new pipes into existing structures, necessary alterations of existing structures and the gravel borrow backfill around the pipe, but all costs in connection therewith shall be included in the unit price bid for 12" Reinforced Concrete Pipe.

No separate payment will be made for concrete connecting collars, but all costs in connection therewith shall be included in the unit price bid for Reinforced Concrete Pipe pipe.

The Contractor shall not disturb any existing overhead or underground utilities crossing the proposed storm drainage piping unless permitted to do so by the Engineer. The Contractor shall be required to provide temporary support and protection of the existing utilities and proposed temporary bypass utilities to the satisfaction of the Engineer and the appropriate utility company.

Payment will be made at the contract unit price bid per linear foot of installed 12 Inch Reinforced Concrete Pipe complete in place, which shall include the cost of all materials, equipment, tools, labor, excavation, backfill, bedding, compaction, any sawcutting and dewatering and all incidentals necessary to complete the work.

ITEM 358**GATE BOX ADJUSTED****EACH**

Work under this Item shall conform to the relevant provisions of Section 301 of the Standard Specifications, and the following:

This work will consist of adjusting gate boxes and curb stops, regardless of size to conform to the proposed line and grade. Boxes and stops located in driveways or in street pavement shall have collars. Gates and stops in sidewalk areas are not required to have collars.

Gate boxes or curb stops damaged by the Contractor's operations will be replaced by the Contractor at his own expense.

Payment shall be at the Contract Unit Bid price per Each, which price shall be full compensation for all labor, equipment, materials to adjust boxes and stops to finish grade, the removal and disposal of old boxes or stops not fit for reuse, and all incidentals necessary to complete the work to the satisfaction of the Engineer.

ITEM 431**HIGH EARLY STRENGTH CONCRETE
FOR BASE COURSE****SQUARE YARD**

Work under this item shall conform to the relevant provisions of Sections 430 "Cement Concrete Base Course" and the following:

The Contractor shall use High-Early-Strength Cement Concrete Base course for roadway box widening as shown on the plans and directed by the Owner. The depth of High Early Strength Cement Concrete Base Course shall be 6 inches.

High early strength concrete shall conform to Subsection M4.02.00 of Division III, Materials of the Standard Specifications.

Preparation and placement of High early strength concrete shall be in accordance with the appropriate Subsection of Section 430.6 of the Standard Specifications.

High Early Strength Concrete for Base Course shall be paid for at the unit bid price per cubic yard in place complete. No additional compensation shall be made for the provision and placement of high early strength concrete in small and isolated quantities.

ITEM 460
ITEM 472

HOT MIX ASPHALT PAVEMENT
HOT MIX ASPHALT FOR MISCELLANEOUS WORK

TON
TON

DESCRIPTION:

This item of work shall consist of furnishing and placing hot mix asphalt pavement.

REFERENCES:

Materials and construction methods shall conform, insofar as applicable, to the requirements of the Massachusetts Standard Specifications for Highways and Bridges, dated 1988, together with all errata addenda additional revisions, and supplemental specifications, all of which are hereinafter referred to as the Massachusetts Standard Specifications.

MATERIALS:

Materials and methods of placing hot mix asphalt pavement shall conform to the requirements of Section 460 of the Massachusetts Standard Specifications.

CONSTRUCTION METHODS:

Materials and methods of placing hot mix asphalt pavement shall conform to the requirements of Section 460 of the Massachusetts Standard Specifications.

- A. The paving plant used by the contractor for preparation of hot mix asphalt paving materials shall be acceptable to the Owner/Engineer who shall have the right to inspect the plant and the making of the material.
- B. All construction methods and materials shall be satisfactory to the Owner/Engineer.
- C. The contractor shall remove and acceptably dispose of all surplus and unsuitable material.
- D. When installing permanent paving on a hot mix asphalt roadway the edges of the existing pavement shall be cut back 12 inches, or more as required, beyond the trench excavation wall or damaged area to sound undamaged material. The edges shall then be straightened, cleaned, and painted with an accepted cutback asphalt to ensure a satisfactory bond between it and the newly placed surface courses. The existing surface course shall be stripped from the bituminous concrete base course for at least a 6-inch width and trimmed square and straight so that new permanent surfacing shall be placed on undisturbed hot mix asphalt base course. Existing pavement that will be under new pavement shall be painted with cutback asphalt to ensure a

course and, when the laying of the course is resumed, the exposed edge of the joint shall be treated as above.

In making joints along any adjoining edge such as curb, gutter or an adjoining pavement, and after the mixture is placed by the mechanical spreader, just enough of the hot material shall be placed by hand method to fill any space left open. These joints shall be properly "set-up" with the back of a rake at the proper height and level to receive the maximum compaction. The work of "setting-up" these joints shall be performed only by competent workmen.

Where and as directed, the first width of any course shall be placed not less than one foot wider than the first width of top course, and successive widths of top and as any other courses shall be so placed that there will be at least a one foot overlap between the joints in the top course and the other course.

The rolling of the successive widths of courses shall overlap and shall be performed so as to leave smooth, uniform joints and cross sections.

- I. Hot mix asphalt for miscellaneous work shall be used at locations as directed by the Engineer, and as shown on the plans including temporary access to driveways, temporary trench patching, and patching of driveways and berms where required.
- J. During the guarantee period, the contractor shall maintain the hot mix asphalt surface and shall promptly make good all defects such as cracks, depressions, and holes that may occur. At all times, the surfacing shall be kept in a safe and satisfactory condition for traffic. If defects occur in surfacing constructed by the contractor, the contractor shall remove all hot mix asphalt and base course affected and shall remove adjacent hot mix asphalt and base course as is necessary to properly correct the defect. After removing hot mix asphalt surface course, the contractor shall correct the cause of the defect and replace the base course and hot mix asphalt in accordance with these specifications.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT:

Hot Mix Asphalt pavement will be measured by the actual number of tons placed. Payment for work completed shall be at the contract unit price bid per tons within the limits of work. Payment shall also include full compensation for all tools, machines and labor and all other work necessary to complete the work in a satisfactory manner. Payment for the adjustments (as required) of drainage and/or sanitary structures, water and/or gas gates shall be included for payment under this item and no separate payment shall be made.

ITEM 464**BITUMEN FOR TACK COAT****GALLON****DESCRIPTION:**

Work under this Item shall conform to the relevant provisions of Section 460 of the Standard Specifications and the following:

REFERENCES:

Materials and construction methods shall conform, insofar as applicable, to the requirements of the Massachusetts Standard Specifications for Highways and Bridges, dated 1988, together with all errata addenda, additional revisions, and supplemental specifications, all of which are hereinafter referred to as the Massachusetts Standard Specifications.

MATERIALS:

Tack coat shall meet the requirements of M3.11.06.

CONSTRUCTION METHODS:

All pavement surfaces shall be tack coated immediately prior to placing each HMA lift. HMA placed over milled surfaces shall be tack coated at an application rate of 0.07 gallon per square yard.

The existing surface shall be cleaned of all foreign matter and loose material and shall be dry before the tack coat is placed.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT:

Bitumen for Tack Coat will be measured for payment by the gallon, complete in place, which price shall include all labor, materials, equipment and incidental costs required to complete the work.

DESCRIPTION:

Work under this Item shall conform to the relevant provisions of Section 460 of the Standard Specifications and the following:

REFERENCES:

Materials and construction methods shall conform, insofar as applicable, to the requirements of the Massachusetts Standard Specifications for Highways and Bridges, dated 1988, together with all errata addenda, additional revisions, and supplemental specifications, all of which are hereinafter referred to as the Massachusetts Standard Specifications.

MATERIALS:

Material for this work shall conform to the requirements of relevant sections of the Massachusetts Standard Specifications, specifically M3.05.0.

CONSTRUCTION METHODS:

All transverse joints and all longitudinal joints of the surface course shall be treated prior to laying the next lane of hot mix asphalt as follows:

The joint shall be coated with a hot poured rubberized asphalt sealant meeting the requirements of M3.05.0. When using pavers in tandem, the use of the hot poured rubberized asphalt sealer may be omitted at the discretion of the Engineer, if the temperature of the mixture at the longitudinal joint does not fall below 200°F (95°C) prior to the placement of the adjacent mat. No re-heating of the joint shall be permitted.

The hot poured rubberized asphalt shall be applied to the joints from a double jacketed heating kettle with a positive drive gear pump that is connected to a suitable applicator. The nozzle of the applicator shall be set to deliver sufficient sealant to effectively bond and seal the transverse and longitudinal paving joint between two adjacent lanes of hot mix asphalt.

Longitudinal and transverse joints shall be made in a careful manner, well bonded and sealed, and true to line and grade. Where and as directed, transverse joints for all courses and longitudinal joints for the top course placed under this or previous contracts shall be cut back to expose the full depth of the course and, when the laying of the course is resumed, the exposed edge of the joint shall be treated as above.

In making joints along any adjoining edge such as curb, gutter or an adjoining pavement, and after the mixture is placed by the mechanical spreader, just enough of the hot material shall be placed by hand method to fill any space left open. These joints shall be properly "set-up" with the back of a rake at the proper height and level to receive the maximum compaction. The work of "setting-up" these joints shall be performed only by competent workmen. Where and as

directed, the first width of any course shall be placed not less than one foot wider than the first width of top course, and successive widths of top and as any other courses shall be so placed that there will be at least a one foot overlap between the joints in the top course and the other course.

The rolling of the successive widths of courses shall overlap and shall be performed so as to leave smooth, uniform joints and cross sections.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT:

Hot poured rubberized asphalt sealer will be measured for payment by the foot, complete in place, which price shall include all labor, materials, equipment and incidental costs required to complete the work.

DESCRIPTION:

The work under this item shall conform to the relevant provision of Section 480 of the Massachusetts Standard Specifications and the following:

REFERENCES:

Materials and construction methods shall conform, insofar as applicable, to the requirements of the Massachusetts Standard Specifications for Highways and Bridges, dated 1988, together with all errata addenda, additional revisions, and supplemental specifications, all of which are hereinafter referred to as the Massachusetts Standard Specifications.

MATERIALS:

Material for this work shall conform to the requirements of relevant sections of the Massachusetts Standard Specifications.

CONSTRUCTION METHODS:

The work shall include the sawcutting of existing pavements or sidewalks at limits of work or as directed by the Engineer.

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

The existing pavement shall be sawcut where as directed and at all joints between existing and proposed pavements, pavement to remain, and to provide a uniform vertical surface for the proposed pavement joint with the existing pavement.

All edges of excavations made in existing pavements and driveways which will not be resurfaced and which will be visible shall be squared by sawcutting with power-driven tools to provide a neat, clean edge for joining new pavement. Ragged, uneven edges shall not be accepted. Areas which have been broken or undetermined shall be edged neatly with a minimum disturbance to remaining pavement.

Sawcut surfaces shall be sprayed or painted with a uniform thin coat of RS-1 asphalt emulsion immediately before placement of asphalt against the surface.

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

METHOD OF MEASUREMENT AND BASIS OF PAYMENT:

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

Sawing pavements will be paid for at the contract unit price per linear foot, which price shall include all labor, materials, equipment, and incidental costs required to complete the work.

<u>ITEM 504 - GRANITE CURB TYPE VA4 - STRAIGHT</u>	<u>FOOT</u>
<u>ITEM 504.1 - GRANITE CURB TYPE VA4 - CURVED</u>	<u>FOOT</u>
<u>ITEM 509 - GRANITE TRANSITION CURB FOR WCR - STRAIGHT</u>	<u>FOOT</u>
<u>ITEM 509.1 - GRANITE TRANSITION CURB FOR WCR - CURVED</u>	<u>FOOT</u>

Work done under these Items shall conform to the relevant provisions of Section 501 of the Standard Specifications and the following:

This item shall consist of furnishing and setting granite curb on a high early strength cement concrete base course foundation.

Materials and construction methods shall conform, insofar as applicable, to the requirements of the Massachusetts Standard Specifications for Highways and Bridges, dated 1988, together with all errata addenda, additional revisions, and supplemental specifications, all of which are hereinafter referred to as the Massachusetts Standard Specifications.

CONSTRUCTION METHOD:

- A. The contractor shall cut a neat line 12 inches from the curb line and remove the asphalt. The contractor shall excavate a trench to a width of 18 inches. The subgrade of the trench shall be a depth below the proposed finish grade of the curb equal to 6 inches plus the depth of the curbstone.
- B. The foundation for the curb shall consist of high early strength cement concrete base course.
- C. Curbs shall be fitted together as closely as possible.
- D. The joints between curbstones (both front and back) shall be carefully filled with cement mortar and neatly pointed on the top and front exposed portions. After pointing, the curbstones shall be satisfactorily cleaned of all excess mortar.

Curbing transitions shall be used to make the transition from normal curb setting for wheelchair ramps and driveway curb cuts as shown on the MassDOT Construction Standard and as detailed on the plans. Curb transitions shall be of the same type and similarity as the abutting curb.

The ends of the transition curb shall be cut so that a flush joint is formed where the transition curb meets the existing or proposed curbing. Transition curb shall be a minimum length of 6.5 feet and a maximum length of 15 feet.

Granite curb shall be paid for at the contract unit price bid per foot, which price shall include excavation, sawcutting for installation of the curb, backfill, labor, materials (including high early strength concrete), equipment and incidental costs required to complete the work.

ITEM 570**HOT MIX ASPHALT CURB****FOOT****DESCRIPTION:**

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

REFERENCES:

Materials and construction methods shall conform, insofar as applicable, to the requirements of the Massachusetts Standard Specifications for Highways and Bridges, dated 1988, together with all errata addenda, additional revisions, and supplemental specifications, all of which are hereinafter referred to as the Massachusetts Standard Specifications.

MATERIALS:

Material for this work shall conform to the requirements of relevant sections of the Massachusetts Standard Specifications.

CONSTRUCTION METHODS:

The work shall consist of furnishing and installing hot mix asphalt curb where existing hot mix asphalt curb is damaged due to construction or needs replacement or as directed by the Engineer.

Hot Mix Asphalt Curb, shall be constructed by means of an approved extrusion machine in conformance with the dimensions and at the locations shown on the Plans.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT:

Hot mix asphalt curb will be measured for payment by the foot, complete in place.

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

DESCRIPTION:

This item of work shall consist of removing and resetting existing curb as needed, where damaged or directed by Engineer.

REFERENCES:

Materials and construction methods shall conform, insofar as applicable, to the requirements of the Massachusetts Standard Specifications for Highways and Bridges, dated 1988, together with all errata addenda, additional revisions, and supplemental specifications, all of which are hereinafter referred to as the Massachusetts Standard Specifications.

MATERIALS:

Material and methods of curb removed and reset shall conform to the relevant provisions of Section 580 of the Standard Specifications.

CONSTRUCTION METHODS:

Where wheelchair ramps and driveways are located, the existing curb shall be used for the transition curb to the maximum extent possible. Therefore the work shall require the removal of sufficient length of the existing curb to provide adequate transition, any cutting of the curb either in-place or after removal, and resetting the curb. The contractor shall be responsible for determining the exact lengths of curb based on field conditions and the current MassDOT standard construction details.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT:

Curb removed and reset shall be measured of the actual number of feet of existing curb removed and reset. Payment for this item will be at the contract unit price bid per foot and shall constitute full compensation and payment for all labor, equipment and materials including excavation and backfill, hot mix asphalt for patching after the curb installation is complete, any sawcutting for removal of the curb, any cutting of the curb and for all incidentals required to finish the work, complete and accepted by the Engineer.

ITEM 590.

CURB REMOVED AND STACKED

FOOT

DESCRIPTION:

Work under these items shall conform to the requirements of Section 580 of the Standard Specifications and the following:

This work shall consist of removing existing curb and edging and stacking them in accordance with these specifications and in close conformity with the lines and grades shown on the plans or established by the Engineer.

CONSTRUCTION METHODS

A trench of sufficient width and depth shall be excavated so that the present curb and edging can be removed without damage.

Removed curb in satisfactory condition will be reused within the project site.

Any remaining curb to be removed as directed by the Engineer, shall be removed and stacked at a City-owned facility designated by the Engineer. Only clean and unbroken sections of curb will be accepted.

METHOD OF MEASUREMENT

The quantity of curb removed and stacked to be paid for will be the length actually removed and stacked as measured along the face of the curb.

Any curb unsuitable for resetting or stacking shall be discarded and classified as unclassified excavation.

Excessively chipped or broken curbs will not be reused. The Engineer will determine which curbs shall be reused.

BASIS OF PAYMENT

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

ITEM 701 - CEMENT CONCRETE SIDEWALK

SQUARE YARD

ITEM 701.1 - CEMENT CONCRETE SIDEWALK AT DRIVEWAYS

SQUARE YARD

ITEM 701.2 - CEMENT CONCRETE WHEELCHAIR RAMP

SQUARE YARD

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

A 6"x6" No. 4 wire fabric (2.83 kg/m²) shall be installed in all sidewalks, wheelchair ramps, driveway aprons, concrete driveways, and concrete walks. The cost of the wire fabric shall be included in items 701, 701.1, and 701.2 and no additional payment shall be made therefore.

Detectable warning panels shall be installed on all wheelchair ramps in accordance with MassDOT standard drawing M/E 107.6.5R and shall be paid for under Item 701.2.

The work of these Items shall be measured and paid for at the Contract Unit Price bid per Square Yard, which payment shall constitute full compensation for furnishing and installing sidewalk, driveways and wheelchair ramps including new concrete, any sawcutting, formwork, fine grading and compaction and all materials, labor, equipment, tools, appurtenances, detectable warning panels and incidentals necessary to satisfactorily complete this item of work, complete in place.

ITEM 702 – HOT MIX ASPHALT WALK SURFACE

TON

ITEM 703 – HOT MIX ASPHALT DRIVEWAY

TON

Work under these Items shall conform to the requirements of Section 701 of the Standard Specifications and the following:

This work shall consist of constructing hot mix asphalt sidewalks and driveways in accordance with these specifications and in locations designated on the plans or by the Engineer.

This item shall be paid for at the contract unit price bid per ton, which price shall constitute full and complete compensation for furnishing, installing, fine grading and compaction, including equipment, tools, labor and incidentals required to finish the work.

ITEM 706**BRICK SIDEWALK****SQUARE YARD****DESCRIPTION:**

The work shall consist of furnishing and installing brick sidewalk as shown and detailed on the plans. Brick sidewalk shall be laid in patterns to match existing sidewalk, unless otherwise directed by the Engineer.

REFERENCES:

The work to be done under these Items shall be in conformance with the relevant provisions of Section 700 of the Massachusetts Standard Specifications.

MATERIALS:

The Brick Pavers shall be for exterior paving, set on a bituminous setting bed and shall meet the requirements of ASTM C902, Class SX Type 1, C PS. Pavers shall be selected to match existing pavers.

Bituminous Setting Bed Materials shall consist of the following: Primer for Base shall conform to ASTM D 2028, cutback asphalt, grade, as recommended by unit paver manufacturer. Fine Aggregate for Setting Bed shall conform to ASTM D 1073, No. 2 or No. 3. Asphalt Cement shall conform to ASTM D 3381, Viscosity Grade AC-10 or Grade AC-20. Neoprene-Modified Asphalt Adhesive shall be paving manufacturer's standard adhesive consisting of oxidized asphalt combined with 2 percent neoprene and 10 percent long-fibered mineral fibers containing no asbestos.

Bituminous setting-bed materials shall be mixed at an asphalt plant in approximate proportion, by weight, of 7 percent asphalt cement to 93 percent fine aggregate, unless otherwise indicated. Mixture shall be heated to 300 deg F (149 deg C).

Sand for joints shall be fine, sharp, washed, natural sand or crushed stone with 100 percent passing No. 16 sieve and no more than 10 percent passing No. 200 sieve.

Nominal dimensions of paver units shall be 4" x 8" x 2.25". The final selection of unit shall be approved by the Engineer. The Contractor shall provide 5 unit panels of brick for the review of the Engineer for approval prior to the ordering units.

Cement concrete base shall be in conformance with the relevant provisions of Section 701 and placed as detailed on the plans.

Expansion joints shall be 5/8" with performed filler in conformance with M9.14.0. Expansion joints shall extend the full depth of the brick, asphalt setting bed and concrete base, and shall be provided along the perimeter of brick paving, and at other locations shown on the plans, or locations where brick sidewalk meets curb or buildings.

Compressible filler shall be pre-formed, closed-cell foam polyethylene, sponge rubber, of proper thickness to be under compression 7/16" thick. It shall be placed 5/8" to 1" below the top of the brick paving to allow for caulking with an additional sealant back-up, which is compatible with the sealant used prior to the installation of the sealant itself.

EXECUTION

- A. All masonry shall be laid by skilled workmen under adequate supervision and shall be laid true to lines and levels. All surfaces shall be true and corners straight and plumb.
- B. All materials shall be delivered, stored and handled to protect them from wetting, staining, chipping and any other damage. Bricks shall be stored off the ground and under watertight covers. Any materials showing evidence of damage will be rejected.
- C. The cement concrete base shall be thoroughly cleaned of all dust, dirt and foreign matter. The allowable tolerance from proposed top of concrete base coat will be 1/8".
- D. No masonry work shall be laid in temperatures below 40°F unless provisions are made to adequately protect materials and the finished work from frost by heating materials, enclosing the work, and heating the enclosed spaces and contact surfaces. Bricks shall be protected against freezing for at least 48 hours after being laid. Any completed work found to be affected by frost shall be removed and redone.
- E. The primer shall be applied to concrete base immediately before placing setting bed. The Contractor shall prepare for setting-bed placement by locating 3/4-inch deep control bars approximately 11 feet apart and parallel to one another, to serve as guides for striking the board. Bars shall be adjusted, as required for accurate setting of paving units to the finished grade.
- F. Bituminous setting bed mix shall be spread at a minimum temperature of 250 deg F (121 deg C). The Contractor shall strike the setting bed smooth, firm, even, and not less than 3/4 inch thick. Fresh bituminous material shall be added to low, porous spots after each pass of striking board. After each panel is completed, the Contractor shall advance first control bar to next position in readiness for striking adjacent panels. The Contractor shall carefully fill depressions that remain after removing depth-control bars and roll the setting bed with power roller to a nominal depth of 3/4 inch. Thickness shall be adjusted as necessary to allow accurate setting of unit pavers to finished grade. All spreading and rolling shall be completed before the mix temperature cools to 185 deg F (85 deg C).
- G. Neoprene-modified asphalt adhesive shall be applied to cold setting bed by troweling to a uniform thickness of 1/16 inch. Contractor shall proceed with setting of paving units only after adhesive is tacky and surface is dry to touch.
- H. Pavers shall be carefully placed by hand in straight courses, maintaining accurate alignment and uniform top surface. Newly laid pavers shall be protected with plywood panels on which workers can stand and advance protective panels, as work progresses,

but maintain protection in areas subject to continued movement of materials and equipment to avoid creating depressions or disrupting alignment of pavers. If additional leveling of paving is required, and before treating joints, roll paving with power roller after sufficient heat has built up in the surface from several days of hot weather.

- I. Pavers are to be placed with hand-tight joints and joints fill by sweeping sand over paved surface until joints are filled. Excess sand shall be removed after joints are filled.
- J. After installation, the work shall be cured for at least five days by covering with curing paper or other approved material.
- K. The Contractor shall be required to modify unexposed faces of brick units to conform to the back face of new and/or existing granite curbing, as well as maintain uniform lines in the appearance of the strip. The Contractor shall also be required to carefully cut and shape brick units around objects in the sidewalk such as manholes, gates and poles.
- L. In case the continuity of the work is suspended, the Contractor shall terminate his paving against temporary wood blocking. The bricks along this blocking shall be set in and to allow removal and tooting of the bricks in the work to be later continued.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT:

Payment for these Items shall be at the Contract unit prices bid per square yard of brick sidewalk complete in place, which prices shall include, four inch cement concrete base, joint filler, compressible filler, caulked sealant, bituminous setting bed, brick pavers with sand joints and all incidental work necessary to construct, protect and cure brick surfaces. Payment under this item shall include gravel borrow sub-base and fine grading and compaction.

ITEM 751 – LOAM BORROW

CUBIC YARD

The work under this item shall conform to the relevant provisions of Section 765 of the Standard Specifications and the following:

The work under this item shall consist of furnishing and placing loam borrow on an approved area. The material for this item shall conform to the relevant provisions of Section M1.05.0 of the Standard Specifications.

The loam borrow obtained from stacked piles shall be hauled, deposited and spread to the directed depth on the areas shown on the plans or designated by the Engineer. All loam is subject to the Engineer's approval. The compaction shall be equivalent to that produced by a hand roller weighing from 75 to 100 pounds per foot of width. The compaction may be obtained by rolling, dragging or any method that produces satisfactory results. All depressions caused by settlement or rolling shall be filled with additional materials and the surfaces shall be re-graded and rolled until it presents a reasonably smooth and even finish and is up to the required grade.

The quantity of loam borrow shall be determined by the cubic yard, delivered and placed to the depth specified on the plans or as directed, by the Engineer.

Loam borrow will be paid for at the contract unit price bid per cubic yard, complete in place, which price shall include full compensation for all labor, materials and equipment necessary to complete the work in a satisfactory manner.

ITEM 765 – SEEDING

SQUARE YARD

The work under this item shall conform to the relevant provisions of Section 765 of the Standard Specifications and the following:

All work shall be performed by or under the direct supervision of a Massachusetts Licensed Arborist.

Seeding General (Dates Only): Any out of season seeding must be approved by the Engineer.

Spring Seeding: March 15 to May 31
Fall Seeding: August 15 to October 15

Application of Fertilizer: After incorporation of ground limestone into the soil, fertilizer meeting the following requirements will be used:

10% nitrogen, 10% phosphoric acid, 10% potassium

(30% of the nitrogen shall be in a slow releasing form as is found in certain urea-form products or natural organic forms, or a combination of both)

The fertilizer shall be spread at the rate of 1000 lbs. per acre on both flats and slopes.

Care During Construction (For Seeding): All areas and parts of areas which fail to show a uniform stand of grass for any reason whatsoever shall be reseeded, and such areas and parts of areas shall be reseeded repeatedly until all areas are covered with a satisfactory growth of grass.

The seed, fertilizer, etc., used in the reseeded operations shall be in the same combination as those originally specified unless otherwise directed by the Engineer.

Care during construction shall include all regrading, refertilizing, reseeding, remulching, watering, and mowing, to condition the work for acceptance as determined by the Engineer.

Watering is considered part of care during construction. Watering is considered a necessary element for establishment and survival. The Engineer may order any or all newly seeded areas to be watered at any time.

All water used shall be obtained from fresh water sources and shall be free from injurious chemical and other toxic substances harmful to plant life. No water which is brackish will be permitted at any time. The Contractor shall identify to the Engineer all sources of water at least 2 weeks prior to use. The Engineer, at his discretion, may take samples of the waters at the source or from the tank at any time, and have a laboratory test the samples for chemical and saline content. The Contractor shall not use any water from any source which is disapproved by the Engineer following such tests.

Mowing of established grass is considered part of the care during construction. Mowing shall be required when grass has obtained a height of 6 inches.

ITEM 765 - SEEDING (continued)

Two mowings shall be required on areas flatter than 3:1. Slopes 3:1 or greater in rural areas will not be mowed.

At the completion of a project, a third mowing to all newly seeded areas flatter than 3:1 may be necessary. This third mowing will be at the discretion of the Engineer.

Each cutting shall result in a stand of evenly mowed grass 3 inches tall immediately following the cutting. The Engineer shall direct the time when each cutting is to commence. Neat trimming shall be necessary around all poles, trees, ledges, delineators, curbs, piers, abutments, and other structures falling within the item area; this trimming will be conducted simultaneously with the mowing during each cutting operation. Trimming equipment shall not come in contact with bark, leaves, branches, or any portion of wood plant material. Any material damaged during the mowing or trimming operations shall be the responsibility of the Contractor. Any damaged material will be replaced at the Contractor's expense.

Turf will be accepted when a dense, uniform stand of grass satisfactory to the Engineer has reached an average height of at least 3 inches.

The quantity of seeding shall be the number of square yards based on actual measurements made over the general contour of the areas seeded, complete in place, and accepted.

This item, including all mowing, will be paid for at the contract unit price per square yard under the item for Seeding, completed in place. When a satisfactory stand of grass has not been established at the time of acceptance, no payment for seeding shall be allowed. At the time of the final estimate is ready to be forwarded to the Contractor the seeded areas will again be inspected by the Engineer and if a satisfactory stand of grass has been established, the seeded areas with a satisfactory stand of grass will be included for payment.

ITEM 767.6

AGED PINE BARK MULCH

CUBIC YARD

DESCRIPTION:

This item shall consist of furnishing and installing aged pine bark mulch in accordance with Section 767 of the Massachusetts Standard Specifications.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT:

Payment under this item shall be at the Contract unit bid per cubic yard, which price shall be full compensation for transporting and spreading pine bark mulch as shown on the plan or directed by the Engineer.

ITEM 832.1

**WARNING-REGULATORY AND ROUTE
MARKER - ALUM. PANEL (TYPE A)**

SQUARE FOOT

DESCRIPTION:

This item shall consist of fabricating, furnishing and installing warning and regulatory signs in accordance with Section 828 of the Massachusetts Standard Specifications.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT:

Payment under this item shall be at the Contract unit bid per square foot, which price shall be full compensation for fabricating, furnishing and installing warning and regulatory signs as shown on the plan or directed by the Engineer.

ITEM 852 - SAFETY SIGNING FOR CONSTRUCTION OPERATIONS SQUARE FOOT

The work under this item shall conform to the relevant provisions of Section 850 of the Standard Specifications and the following:

Materials shall conform to Sections 828 and 840 except the plywood material shall conform to the following: Plywood sign panels and independent Route Markers shall be fabricated from 5 ply 5/8" thick Medium Density Overlaid (MDO) 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 US Product Standard PS1-74 for Construction and Industrial Plywood. All 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, or Type IV, and shall be orange in color.

Background sheeting for the first set of signs on each approach to the work zone shall be of a fluorescent orange color. The maximum spectral radiance factor, in accordance with Section 5.1 of ASTM E991, for the fluorescence shall be as follows:

New:	110%, min.
Weathered:	60%, min.

The work shall include furnishing, installing and maintaining various traffic control devices for the protection of the traveling public and working personnel during the construction operations in compliance with the plans, specifications and as directed by the Engineer.

Flags for Advance Warning Signs

Standard orange and red-orange flags (16-inch by 16-inch minimum) shall be mounted on all advance work area signs.

No separate payment will be made for the furnishing, erection and maintenance of the flags, but all costs in connection therewith shall be included in the contract unit price bid.

This item shall be measured and paid at the contract unit price bid per square foot, which price and payment shall constitute full compensation for furnishing, installing, and maintaining all materials including labor, equipment, tools, appurtenances, and incidentals necessary to satisfactorily complete this item of work, complete, in place and accepted. This item shall include removing the traffic control devices at the end of the project.

ITEM 853.10 – PORTABLE BARRICADE TYPE III

EACH

The work under this item shall conform to the relevant provisions of Section 850 of the Standard Specifications and the following:

Item includes furnishing portable barricades for traffic control during construction per the locations indicated on the plans or as directed by the Engineer.

This item shall be paid for by each which shall constitute full payment for all material, labor and equipment necessary to furnish, install, maintain, move and remove the barricades.

ITEM 859 – REFLECTORIZED DRUM

DRUM DAY

The work under this item shall conform to the relevant provisions of Section 850 of the Standard Specifications and the following:

This item includes furnishing portable reflectorized drum for traffic control during construction per the locations indicated on the plans or as directed by the Engineer.

This item shall be paid for at the contract bid price per Drum-Day which shall constitute full payment for all materials, equipment necessary to furnish, install, maintain, move, and remove the reflectorized drums.

ITEM 854.20

PAVEMENT MARKING REMOVAL

SQUARE FOOT

DESCRIPTION

The work under this item shall conform to the relevant provisions of Sections 850 of the Standard Specifications and the following:

The work shall include the removal of all existing pavement markings (by a method approved determined by the Resident Engineer) within the limits of work not being re-applied and is to include any existing painted or thermoplastic markings.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Pavement marking removal will be measured by the square foot of marking removed.

Payment for this item shall be made at the contract unit price per square foot of marking removed, which shall include all labor, materials, and equipment required to complete the work as described above.

<u>ITEM 864.04 – PAVEMENT ARROWS AND LEGENDS REFL. WHITE (THERMO)</u>	<u>SF</u>
<u>ITEM 865.1 – CROSS WALKS AND STOP LINES REFL. WHITE (THERMO)</u>	<u>SQUARE FOOT</u>
<u>ITEM 865.99 – MISCELLANEOUS SYMBOLS REFL. WHITE (THERMO)</u>	<u>SQUARE FOOT</u>
<u>ITEM 866.04 – 4 INCH REFLECTORIZED WHITE LINE (THERMO)</u>	<u>FOOT</u>
<u>ITEM 866.06 – 6 INCH REFLECTORIZED WHITE LINE (THERMO)</u>	<u>FOOT</u>
<u>ITEM 866.12 – 12 INCH REFLECTORIZED WHITE LINE (THERMO)</u>	<u>FOOT</u>
<u>ITEM 867.04 – 4 INCH REFLECTORIZED YELLOW LINE (THERMO)</u>	<u>FOOT</u>
<u>ITEM 867.06 – 6 INCH REFLECTORIZED YELLOW LINE (THERMO)</u>	<u>FOOT</u>

The work to be done under these items shall conform to the relevant provisions of Section 860 and the following:

This item includes the installation of new thermoplastic pavement markings as indicated on the plans or as directed by the Engineer. Installation shall be per latest MassDOT requirements. Existing pavement markings in conflict with proposed pavement markings shall be removed prior to installation.

Measurement for markings shall be made for the actual length of lines installed complete in place.

Payment for pavement markings will be made for the quantities as above determined, measured by the unit per foot for Items 866.04, 866.06, 866.12 and 867.04 and 867.06 and by the unit per square foot for Items 864.04, 865.1 and 865.99, which unit price and payment shall be full compensation for the satisfactory application and for furnishing all material, labor, tools, equipment and any other incidentals necessary to complete the work. Removal of existing pavement markings shall be paid for under item 854.991.

<u>ITEM 864.204</u>	<u>PAVEMENT ARROWS AND LEGENDS (POLYUREA) (RECESSED)</u>	<u>SQUARE FOOT</u>
<u>ITEM 866.206</u>	<u>6 INCH REFLECTORIZED WHITE LINE (POLYUREA) (RECESSED)</u>	<u>FOOT</u>
<u>ITEM 866.212</u>	<u>12 INCH REFLECTORIZED WHITE LINE (POLYUREA) (RECESSED)</u>	<u>FOOT</u>

DESCRIPTION

The work to be done under these items shall conform to the relevant provisions of Section 860 of the Standard Specifications, Supplemental Specifications, Standard Special Provisions, and the following:

Work under these items shall consist of the furnishing and installation of white and yellow polyurea reflectorized pavement markings (including edge lines, skip lines, pavement arrows, and gore lines) on all new mainline, ramp, and scenic area pavement surfaces.

As work incidental to these items the Contractor or polyurea Material Supplier shall measure the performance of the pavement markings upon installation, at 6 months, and at 12 months after application.

MATERIALS

VERY FAST CURING POLYUREA TRAFFIC PAINT (no-track times < 10 minutes).
 Innovative Performance Systems HPS-5, Ph. 800.448.3482
 Epoplex LS-90, Ph. 800.822.6920
 3M Series 1000 and 1200 LPM, Ph. 800.553.1380

CONSTRUCTION METHODS

All work shall be done in accordance with the Material Suppliers specifications and the following:

1. The polyurea binder shall be applied at rates to achieve a minimum uniform wet thickness of 25±2 mils.
2. Items 866.206 & 867.206 for edge lines and skip lines (mainline only) shall be applied into a 6-3/4 inch ± 1/4 inch wide x 45 mils ± 5 mils deep RECESSED groove. The recessed groove shall be constructed in accordance with the polyurea manufacturer's recommended procedures. Particular attention shall be paid to the surface texture. The acceptability of the surface texture will be decided by the Engineer and/or Manufacturer's Technical Representative. A two (2) inch offset from the edge of the recessed groove to the longitudinal surface course pavement

joint is desirable.

3. Items 866.212 for gore lines shall be applied into a 12-3/4 inch \pm 1/4 inch wide x 45 mils \pm 5 mils deep RECESSED groove. The recessed groove shall be constructed in accordance with the polyurea manufacturer's recommended procedures. Particular attention shall be paid to the surface texture. The acceptability of the surface texture will be decided by the Engineer and/or Manufacturer's Technical Representative. A two (2) inch offset from the edge of the recessed groove to the longitudinal surface course pavement joint is desirable.

Marking Performance

The typical average initial retroreflectance of the markings shall be 600 [(mcd(ft-2)(fc-1)] for white and 400 [(mcd(ft-2)(fc-1)] for yellow. The initial performance of the pavement markings shall be measured within seven (7) days after application. Measurements shall also be made six (6) and twelve (12) months after application.

The average initial retroreflectance shall be determined according to the measurement and sampling procedures outlined in ASTM D 6359, using a 30 meter retroreflectometer. The 30 meter retroreflectometer shall measure the coefficient of retroreflected luminance, RL, at an observation angle of 1.05 degrees and an entrance angle of 88.76 degrees. RL shall be expressed in units of millicandelas per square foot per foot-candle [(mcd(ft-2)(fc-1)]. The metric equivalent shall be expressed in units of millicandelas per square meter per lux [mcd(m-2)(lux-1)].

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Measurement and payment shall be in accordance with paragraphs 860.80 & 860.81 of the Standard Specifications. Payment for Items 864.204, 866.206 and 866.212 shall include all costs associated with recessing the polyurea markings.

<u>ITEM 865.1</u>	<u>CROSS WALKS AND STOP LINES REFL. WHITE (THERMO)</u>	<u>SQ.FEET</u>
<u>ITEM 866.06</u>	<u>6 INCH REFLECTORIZED WHITE LINE (THERMOPLASTIC)</u>	<u>FEET</u>
<u>ITEM 867.06</u>	<u>6 INCH REFLECTORIZED YELLOW LINE (THERMOPLASTIC)</u>	<u>FEET</u>

This item shall consist of furnishing materials and the application of reflectorized cross walks, stop lines and 6 inch white or yellow lines in accordance with the Manual on Uniform Traffic Control Devices, current edition.

Materials and construction methods shall conform, insofar as applicable, to the requirements of the Massachusetts Standard Specifications for Highways and Bridges, dated 1988, together with all errata addenda, additional revisions, and supplemental specifications, all of which are hereinafter referred to as the Massachusetts Standard Specifications.

Material and methods of applying reflectorized pavement markings shall conform to the requirements of Section 860 of the Massachusetts Standard Specifications.

- A. All painting shall be in accordance with Manual on Uniform Traffic Control Devices
- B. All painting must be accepted and approved by the Superintendent of Streets or the Director of the Department of Public Works.
- C. Painting will not be allowed on damp, wet or dirty road surfaces.
- D. Painting will not be allowed if the temperature is below 40° F.
- E. The contractor shall notify the Superintendent of Streets 48 hours in advance of painting.
- F. The contractor shall furnish adequate protection to freshly painted lines to keep traffic off of them until thoroughly dry.

Cross Walks and Stop Lines shall be measured by the square feet of lines installed complete in place. 6 Inch ReflectORIZED Line shall be measured by the actual length installed complete in place.

Payment for Cross Walks and Stop Lines will be made for the quantities as above determined, measured by the unit per square feet and 6 Inch ReflectORIZED Line will be measured by the unit per feet, which unit price and payment shall be full compensation for the satisfactory application and for furnishing all material, labor, tools, equipment and any other incidentals necessary to complete the work.

**ITEM 874.20 – TRAFFIC AND STREET NAME SIGN
REMOVED AND RESET ON NEW POST**

EACH

The work under this item shall conform to the relevant provisions of sections 828 and 840 of the Standard Specifications and the following:

Work to be done under this item shall include the dismantling, removal, transporting and resetting of the existing signs at the locations established by the Engineer in the field. The Traffic and Street Name signs will be set on new U-Channel Type P-5 Posts. The work also includes the removal and disposal of the existing sign supports.

The Contractor shall exercise particular care in the dismantling, removal, transporting and resetting of the existing signs designated to be reused. Any sign panel damaged through carelessness or lack of protection by the Contractor shall be replaced at the Contractor's expense.

The Contractor shall backfill with compacted gravel all holes resulting from the removal of the existing signs and their foundations and restore the area to match existing conditions of adjacent areas.

Traffic and Street Name Signs Removed and Reset on New Post shall be measured per each, complete in place.

Traffic and Street Name Signs Removed and Reset on New Post will be paid for at the Contract unit price per each, which price shall include all labor, materials, equipment, and incidental costs required to complete the work.

The contract unit price for Traffic and Street Name Signs Removed and Reset on New Post will include the new U-Channel Type P-5 Posts for which no additional payment will be made.

ITEM 874.50 – TRAFFIC SIGN REMOVED AND STACKED

EACH

Work under this Item shall include the dismantling, removal, and stacking of the existing roadside traffic signs.

The work under this item shall also include the removal and disposal of the sign supports and their foundations as directed by the Engineer.

If the Engineer or the Municipality determines that any part of the stacked materials is unsuitable for re-use, said materials shall become the property of the Contractor and he shall dispose of them outside and away from the limits of the project, without additional compensation.

The work shall include removing the supports, excavating the existing foundation, the disposal of the concrete and supports, the backfilling with compacted gravel of the holes resulting from the excavation and removal of the supports and the replacement, in kind, of any surface material disturbed.

The existing signs shall not be removed until the new signs and structures replacing them are ready for installation or until the Engineer orders their removal.

Traffic Sign Removed and Stacked shall be measured per each, complete in place.

Traffic Sign Removed and Stacked will be paid for at the Contract unit price per each, which price will be full compensation for dismantling, removal, and stacking the signs and supports as designated above, the excavation and disposal of the existing foundations, the supplying and placing of compacted gravel backfill where foundations and posts are removed, restoration of surface, and all other incidentals necessary for the proper completion of this Item.

<u>ITEM 864.21</u>	<u>RAISED PAVEMENT MARKER ONE-WAY WHITE</u>	<u>EACH</u>
<u>ITEM 864.25</u>	<u>RAISED PAVEMENT MARKER TWO-WAY YELLOW/YELLOW</u>	<u>EACH</u>
<u>ITEM 864.31</u>	<u>SLOTTED PAVEMENT MARKER ONE-WAY WHITE</u>	<u>EACH</u>
<u>ITEM 864.35</u>	<u>SLOTTED PAVEMENT MARKER TWO-WAY YELLOW/YELLOW</u>	<u>EACH</u>

The work to be done under this item shall consist of furnishing and installing two-way yellow/yellow reflectorized pavement markers and one-way white reflectorized pavement markers (raised or slotted in pavement) in accordance with the relevant provisions of Traffic Standard Drawing TR.6.5 "Typical Pavement Markings for Conventional Roadways", and the following:

- Two-way yellow/yellow markers shall be installed along the double yellow center line at 40 foot intervals. (Typical locations shown per the Const. and Traffic Standard Dwg, TR.6.5.)
- One way white markers shall be installed along the broken white lane lines at the midway point between successive skip lines at 80 foot intervals. (Typical locations shown per the Const. and Traffic Standard Dwg, TR.6.3.)

Construction Methods

Slotted Markers - The work shall include cutting the tapered pavement slot to the dimensions shown on the typical detail, application of the manufacturer's recommended epoxy adhesive, and placing the reflectorized pavement marker in the proper position within the slot so that the reflective face is visible and perpendicular to oncoming traffic and so that the top of the marker is set 1/8± inch below the top of the adjacent pavement.

Raised Markers - Surface preparation and installation shall be strictly in accordance with the manufacturer's instructions.

Materials:

Reflectorized pavement markers shall be as manufactured by:

1. 3M 190, 3M Traffic Control Materials Division, 3M Center, St. Paul, MN 55144-1000 (612)733-1110 (800)553-1380 www.3m.com/product/index.html
2. Ray-O-Lite 2004, Pac-Tec Inc., Mid Ohio Industrial Park, 1870 James Parkway, Heath, OH 43056 (740)928-6238 (800)848-7025 www.ravolite.com
3. Avery Dennison Model 944, Avery Dennison, 6565 W. Howard Street, Niles, IL 60714--3889 (847)647-7717 (800)327-5917 www.reflectives.averydennison.com or an approved equivalent.

The number of two-way yellow/yellow reflectorized pavement markers and one-way white reflectorized pavement markers (slotted in pavement), completely furnished and installed, shall be measured by the Unit Each as a complete installation.

The Contract Unit Price for two-way yellow/yellow reflectorized pavement markers and one way white reflectorized pavement markers (slotted in pavement) shall include cutting the tapered pavement slot, furnishing and installation of the reflectorized markers, including all necessary materials, labor, incidentals, and equipment.

ITEM 877.3 Sign Post - Municipal Standard

The work to be done under this item shall consist of furnishing and installing Sign Posts in accordance with current MassDOT Standards, as directed by the Engineer.

Sign Posts shall be 10-foot long, galvanized channel posts, 2 lbs, per foot (10-GV).

The Contract Unit Price for each sign post shall include furnishing and installation of the posts, including all necessary materials, labor, incidentals, and equipment.”