

DOCUMENT A00801

**SPECIAL PROVISIONS**

**DISTRICT 6**

**Scheduled and Emergency Fire Line, Standpipe and Hydrant Repairs  
and Improvements at Various Locations**

Labor participation goals for this Project shall be 15.3% for minorities and 6.9% for women for each job category. The goals are applicable to both Contractor's and Subcontractor's on-site construction workforce. Refer to Document 00820 for details.

**SCOPE OF WORK**

All work under this contract shall be done in conformance with the *2020 Standard Specifications for Highways and Bridges*, the *Supplmental Specifications* contained in this book, the *2017 Construction Standard Details*, the *Traffic Management Plans and Detail Drawings*, the *1990 Standard Drawings for Signs and Supports*; the *2015 Overhead Signal Structure and Foundation Standard Drawings*, the *2009 Manual on Uniform Traffic Control Devices (MUTCD)* with Massachusetts Amendments; the *1968 Standard Drawings for Traffic Signals and Highway Lighting*; *The American Standard for Nursery Stock*; the Plans and these Special Provisions.

The work performed under this contract shall include hydrant and standpipe repairs at various roadways and tunnels throughout District Six as directed by the Engineer.

The work consists of, replacement of defective hydrants, excavation to locate breaks in standpipe systems, repair of waterline and fire line breaks and leaks, installation of new water line, repairs to pavement at waterline repair.

The proposed work also includes adjustments to hydrants, gates, gate boxes; cleaning, and miscellaneous work to waterlines and standpipe systems.

This is a maintenance project and will require flexibility on the Contractor's part regarding prosecution of work.

**LOCATION OF WORK**

Work under this contract will be required on any or all state highways and roadways within District 6. Work locations will be within the limits of District 6 on various roadways as assigned by the Engineer.

MassDOT - Highway Division reserves the right to add additional roadways or locations throughout the duration of this contract. Locations will be determined by the Engineer.

## **CONTRACTOR QUESTIONS AND ADDENDUM ACKNOWLEDGEMENTS**

Prospective bidders are required to submit all questions to the Construction Contracts Engineer by 1:00 P.M. on the Thursday before the scheduled bid opening date. Any questions received after this time will not be considered for review by the Department.

Contractors should email questions and addendum acknowledgements to the following email address [massdotSpecifications@dot.state.ma.us](mailto:massdotSpecifications@dot.state.ma.us) The MassDOT project file number and municipality is to be placed in the subject line.

## **SUBSECTION 7.05 INSURANCE REQUIREMENTS**

### **B. Public Liability Insurance**

The insurance requirements set forth in this section are in addition to the requirements of the Standard Specifications and supersede all other requirements.

### **Paragraphs 1 and 2**

The Massachusetts Department of Transportation and applicable railroads shall be named as additional insureds.

## **ACCESS MASSDOT HIGHWAY INFORMATION ON WEBSITE**

Access MassDOT Highway Information related to Construction, Design/Engineering, Contractor/Vendor Information, Approved Materials and Fabricators, Manuals, Publications and Forms at:

<http://www.mass.gov/massdot/highway>

Select Doing business with us

## **DESIGNER/PROJECT MANAGER**

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MassDOT District 6  
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**CONTRACTOR/SUBCONTRACTOR CERTIFICATION – CONTRACT COMPLIANCE**

(Revision 03-23-10)

Pursuant to 23 C.F.R. § 633.101 et seq., the Federal Highway Administration requires each contractor to “insert in each subcontract, except as excluded by law or regulation, the required contract provisions contained in Form FHWA–1273 and further requires their inclusion in any lower tier subcontract that may in turn be made. The required contract provisions of Form FHWA–1273 shall not be incorporated by reference in any case. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the requirements contained in the provisions of Form FHWA–1273.” The prime contractor shall therefore comply with the reporting and certification requirements provided in MassDOT’s CONTRACTOR/SUBCONTRACTOR CERTIFICATION Form (DOT-DIST-192) certifying compliance with 23 C.F.R. § 633.101 for each subcontract agreement entered into by the contractor. The contractor shall provide a fully executed original copy of said CONTRACTOR/SUBCONTRACTOR CERTIFICATION Form to MassDOT upon execution of any subcontract agreement. Failure to comply with the reporting and certification requirement of the CONTRACTOR/SUBCONTRACTOR CERTIFICATION Form may result in action against the prequalification status of the prime contractor with MassDOT.

**CONTRACT AWARD AND NOTICE TO PROCEED PROCEDURES**

(Amending and Supplementing Subsections 3.03 and 3.05)

The prepared Contract Package is to be completed in duplicate by the successful Bidder who shall execute and deliver the Contract Package and furnish the required surety to the Department. The date of the Contract shall be the date of the Bidder’s signature and shall be typed on all forms by the successful Bidder. The Contract Package consists of the contract forms for execution all of which must be returned. These documents are available on [www.bidx.com](http://www.bidx.com) as a separate file.

The company’s corporate seal should be affixed to both the Contract and bonds.

The Board of Director’s Vote will indicate who is authorized to sign and execute the Contract and bonds and affix the corporate seal. The vote shall show that said vote is in full force and effect and has not been amended or rescinded. The vote of the board of directors should be dated the same date as indicated on the contract form and should bear the imprint of the company’s corporate seal.

## **COVID 19 GUIDELINES AND PROCEDURES**

Commonwealth of Massachusetts COVID-19 GUIDELINES AND PROCEDURES FOR ALL CONSTRUCTION SITES AND WORKERS AT ALL PUBLIC WORK dated March 2020 as amended shall be adhered to.

It is the Contractor's responsibility to stay current with any changes or addendums issued to these guidelines. For copies of the guidelines go to:

<https://www.mass.gov/covid-19-guidelines-and-procedures-for-all-construction-sites-and-workers-at-all-public-work>

These Guidelines and Procedures will remain in effect until further notice. At the start of the Work the Contractor is required to submit a letter to the Engineer certifying that the Contractor is in compliance with CDC, OSHA and the Commonwealth's COVID-19 guidelines. The certification applies to the general contractor as well as all subcontractors engaged with the Work covered under this contract. No Work will be allowed to begin until the letter is submitted and approved by the Engineer. In addition, on a daily basis, the Contractor is required to submit a copy of the MassDOT Contractor COVID-19 Guidelines Compliance Checklist to the Engineer. If the Contractor fails to submit the daily checklist no work will be allowed until one is submitted. Any items checked with a NO will require immediate corrective action by the Contractor before any Work can begin.

Per Subsection 5.09 – Inspection of the Work - the Contractor is required to provide assistance to the Engineer to make a complete and detailed inspection of the work. That assistance includes furnishing equipment to perform the inspection, therefore the Contractor will be required to provide CDC compliant Personal Protective Equipment (PPE) to Department personnel field staff. The CDC compliant PPE shall consist of face masks, gloves and eye protection.

All costs associated with compliance with this provision are considered to be incidental to the contract cost and therefore the Contractor will not be entitled to any additional compensation.

## **WORK SCHEDULE**

All proposed work hours shall conform to Subsection 7.09 and be subject to the written approval of the Engineer.

Work may not proceed beyond the normal 8-hour day unless prior approval is obtained from the Engineer for that day. Approval to work overtime will only be given when special conditions exist that warrant working overtime as determined by the Engineer.

Allowable work hours for specific locations will be determined by the District Highway Director or his/her representative. On high volume and/or high-speed roadways, work may be restricted to non-peak hours or night work as directed by the Engineer to avoid peak traffic volumes in order to maintain safety and productivity.

Prior to the commencement of work, MassDOT shall approve work hours on this project.

Work orders may contain restricted hours. Some Items may require extended work hours. When scheduling any work, the Contractor must adhere to the department's policy concerning traffic delays.

Work will be restricted to one roadway at all times unless additional work crews are approved by the Engineer. The Contractor shall not begin any work, other than emergency work, in any other roadway until the roadway being worked on is completed.

Scheduled and/or emergency work may be required regardless of weather conditions, at the discretion of the Engineer.

All personnel and equipment must be off the traveled way, including shoulders, during the restricted hours. The work schedule shall include the "set-up" and "breakdown" of the traffic controls. The Engineer reserves the right to alter work hours to accommodate road-closing schedules as needed.

Activity on this project may be done during the daytime or during the nighttime as needed and as directed. No additional compensation will be made for work scheduled during nighttime hours.

**WORK SCHEDULE** (Continued)

**Day Time Work**

Any approved daytime operation(s) that consistently has (have) an adverse effect on traffic flow may be shifted to nighttime at the Engineers' discretion. For daytime operations on high volume and/or high speed roadways, no work will be done on the roadways between the hours of 5:00 AM to 10:00 AM, and between the hours of 3:00 PM to 8:30 PM, Monday through Friday, unless otherwise directed by the Engineer.

On a two lane undivided highway two way traffic shall be maintained during "peak hours". On Interstate highway all lanes shall remain open during the "peak hours".

**Night Time Work**

All work locations requiring night hours, as approved by the Engineer, are restricted as follows:

Sunday,	9:00 P.M.	to Monday,	5:00 A.M.
Monday,	9:00 P.M.	to Tuesday,	5:00 A.M.
Tuesday,	9:00 P.M.	to Wednesday,	5:00 A.M.
Wednesday,	9:00 P.M.	to Thursday,	5:00 A.M.
Thursday,	9:00 P.M.	to Friday,	5:00 A.M.

The setting up and removal of all Traffic Control Devices shall be completed within the above time frames.

No work adversely affecting traffic will be allowed unless the Contractor has provided a substitute traffic pattern or detour route, approved by the Engineer.

**Work Access**

Access to District Six Roadway work sites requires coordination. The Contractor is required to complete a Access Work Request Form and submit the completed form (signed by MassDot Resident Engineer) to Mr. Robert Hutcheon via email at [Robert.hutcheon@dot.state.ma.us](mailto:Robert.hutcheon@dot.state.ma.us) by the Wednesday of the week preceding the work. MassDOT notifications (approvals and denials) will be delivered via email by noon on Friday. All forms shall be signed by the Resident Engineer prior to submitting to Robert Hutcheon.

The Contractor shall contact Mr. Bob Hutcheon, from 7:30 AM to 3:00 PM Monday through Friday ONLY at (617) 828-2171 (office) or via email at [Robert.hutcheon@dot.state.ma.us](mailto:Robert.hutcheon@dot.state.ma.us), as well as the Resident Engineer one (1) week prior to the start of work. Work Access is subject to change based on MassDOT needs.

## **HOLIDAY WORK RESTRICTIONS FOR CALENDAR YEAR 2020**

(Supplementing Subsection 7.09)

The District Highway Director (DHD) may authorize work to continue during these specified time periods if it is determined by the District that the work will not negatively impact the traveling public.

Below are the holiday work restrictions for the calendar year 2020.

### New Years Day (Federal Holiday)

Wednesday, January 1, 2020:

No work on major arterial roadways from 5:00 AM on Tuesday, December 31, 2019 until the normal start of business on Thursday, January 2, 2020. No work on local roadways on the holiday without permission by the DHD and the local police chief.

### Martin Luther King's Birthday (Federal Holiday)

Monday, January 20, 2020:

No work restrictions due to traffic concerns however work on local roadways requires permission by the DHD and local police chief.

### President's Day (Federal Holiday)

Monday, February 17, 2020:

No work restrictions due to traffic concerns however work on local roadways requires permission by the DHD and local police chief.

### Evacuation Day (Suffolk County State Holiday)

Tuesday, March 17, 2020:

No work restrictions due to traffic concerns.

### Patriot's Day (State Holiday)

Monday, April 20, 2020:

Work restrictions will be in place for Districts 3, 4 and 6 along the entire Boston Marathon route and any other locations that the DHD in those districts determine are warranted so as to not to impact the marathon. All other districts work restrictions will be as per DHD.

### Mother's Day

Sunday, May 10, 2020:

No work on Western Turnpike and Metropolitan Highway System from 5:00 AM on Friday, May 8, 2020 until the normal start of business on Monday, May 11, 2020.

### Memorial Day (Federal Holiday)

Monday, May 25, 2020:

No work on major arterial roadways from 5:00 AM on Friday, May 22, 2020 until the normal start of business on Tuesday, May 26, 2020.

## **HOLIDAY WORK RESTRICTIONS FOR CALENDAR YEAR 2020** (Continued)

### Bunker Hill Day (Suffolk County State Holiday)

Wednesday, June 17, 2020:

No work restrictions due to traffic concerns.

### Independence Day (Federal Holiday)

Saturday, July 4, 2020:

No work on major arterial roadways from 5:00 AM on Friday, July 3, 2020 until the normal start of business on Monday, July 6, 2020.

### Labor Day (Federal Holiday)

Monday, September 7, 2020:

No work on major arterial roadways from 5:00 AM on Friday, September 4, 2020 until the normal start of business on Tuesday, September 8, 2020.

### Columbus Day (Federal Holiday)

Monday, October 12, 2020:

No work on major arterials from 5:00 AM on Friday, October 9, 2020 until the normal start of business on Tuesday, October 13, 2020. DHD may allow work in those areas on a case by case basis and where work is behind barrier and will not impact traffic.

### Veterans' Day (Federal Holiday)

Wednesday, November 11, 2020:

No work restrictions due to traffic concerns.

### Thanksgiving Day (Federal Holiday)

Thursday, November 26, 2020:

No work on major arterials from 5:00 AM on Wednesday, November 25, 2020 until the normal start of business on the Monday, November 30, 2020.

### Christmas Day (Federal Holiday)

Friday, December 25, 2020:

No work on major arterial roadways from 5:00 AM on Thursday, December 24, 2020 until the normal start of business on Monday, December 28, 2020.



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## **CONTRACTOR NOTIFICATION**

### **Scheduled Work**

The Contractor will be notified of scheduled work by either a written or electronic Work Order. The work order will identify the location and a detailed scope of work for the assignment. This work shall be scheduled and commence on site within five (5) days of notification by the Department.

MassDOT may also direct that scheduled or routine assignments shall commence on a particular date and time. If the Contractor has not reported and started work within 4 hours the time expected, a non-response penalty will be assessed to the contractor.

### **Emergency Work**

Since it may be necessary for the Contractor to respond to emergency situations where immediate response is necessary, the Contractor is required to provide to MassDOT the name(s) and telephone number(s) of a person or persons who can be contacted 24 hours a day for the contract's duration, and who has the authority to provide whatever labor, materials, and equipment that may be necessary to address the emergency.

The Contractor will be notified of emergency work that REQUIRES IMMEDIATE ATTENTION by verbal *and* written/electronic Work Order. The work order will identify the location of the work, the scope of the work and details the Engineer's expectations. The Work Order will also identify lane closure(s) required.

The Contractor will be required to commence this emergency work on site within four (4) hours, unless otherwise directed, after notification by the Department.

## **NON-RESPONSE PENALTIES**

(Supplementing Subsection 8.11)

### **Scheduled Work**

If after notification, the Contractor has not started scheduled work on site within five (5) days of the notification, a non-response penalty will be assessed to the Contractor. Contract payments will be reduced by five hundred dollars (\$ 500.00) for each day or portion of a day that the work is delayed, excluding Saturdays, Sundays, and Holidays, *unless the work was scheduled to be performed on one of these days.*

### **Emergency Work**

If after notification, the Contractor has not started emergency work on site within four (4) hours of the notification, a non-response penalty will be assessed to the Contractor. Contract payments will be reduced by five hundred dollars (\$ 750.00) for each time there is a failure to respond within the specified hours.

The Contractor is advised that operational circumstances may not allow access and completion of repairs within the specified response window above. Therefore, the Contractor shall coordinate with the Engineer to schedule access for earliest MassDOT availability.

## **WARRANTY OF THE WORK**

The Contractor shall expressly warrant for a period of one (1) year after Final Acceptance, unless a longer period is specified in the Contract, that all material, equipment, and workmanship furnished for the Project are free from defects and fully comply with the requirements of the Contract documents. Liability under this warranty expands the scope of the Contractor's responsibility for defective work beyond the date of Final Acceptance. Defective materials and equipment are defined as materials and equipment which, in the opinion of the Engineer, are not performing properly for the purpose for which they were intended and/or as required by the Contract documents.

The Contractor shall correct or repair any work or replace any materials or equipment furnished that is determined to be defective to the satisfaction of the Department. The Contractor shall also correct any problems resulting from poor workmanship as determined by the Engineer.

If the Contractor fails to correct any defective work identified during the warranty period, the Department reserves its rights to take action against the Contractor's prequalification status. In addition, if the Contractor fails to perform the required corrective work the Department may seek recourse through the Contractor's surety if any additional costs are incurred by the Department to correct the defective work.

## **TRAFFIC ACCOMMODATION**

(Supplementing Subsection 7.17)

Safety devices and signage for construction operations shall comply with the relevant provisions of Subsection 850 of the Standard Specifications, and the following:

Safety devices and sign placement shall conform to the applicable sketches shown in the standard Work Zone Safety Guidelines included herein as Document A00815.

*Truck Mounted Attenuators, when shown in the sketches, are mandatory for this project.*

The Contractor shall bring three sets of the appropriate sketches for the work site to all work order assignment meetings. The purpose is to ensure that all concerned parties (i.e. Contractors, Sub-Contractors and the Engineer) have and agree upon the required traffic management for the specific working conditions.

Traffic police, when required, shall be located at a sufficient distance in advance of the work area, so that they can warn oncoming motorists of the work.

## **NOTICE TO OWNERS OF UTILITIES**

(Supplementing Subsection 7.13)

Written notice shall be given by the Contractor to all public service corporations or officials owning or having charge of publicly or privately owned utilities of his/her intention to commence operations affecting such utilities at least one week in advance of the commencement of such operations and the Contractor shall at that time file a copy of such notice with the Engineer.

The following website lists the names and addresses of the utilities presumed to be affected. This list is for guidance only and is not guaranteed to be complete or up to date.

<https://www.mass.gov/info-details/utility-contacts-by-district-and-municipality>

Select Search for utility contacts for MassDOT projects

Select District 6, select the City/Town, and then locate the utility

The Contractor shall also be responsible for informing the following officials in each area that he is assigned to work in as required by the Engineer:

Superintendent, Department of Public Works or Town Engineer

Superintendent, Water and Sewer Department

Police and Fire Department

Electric Department

## **NATIONAL GRID EMERGENCY TELEPHONE NUMBERS**

### **GAS:**

Emergency: 1-800-233-5325

New Service: 1- 877-696-4743

Customer Support: 1-800-732-3400

### **ELECTRIC:**

Outage/ Emergency: 1-800-465-1212

New Service: 1-800-375-4730

Customer Support: 1-800-322-3223

## **EVERSOURCE EMERGENCY TELEPHONE NUMBERS**

### **GAS:**

Outage/ Emergency: 800-592-2000

New Service: 866-678-2744

Customer Support: 800-592-2000

### **ELECTRIC:**

Outage/ Emergency: 800-592-2000 or 844-726-7562

New Service: 1-888-633-3797 (1-888-need pwr)

Customer Support: 1-800-340-9822

## **ENVIRONMENTAL PERMITS, CONDITIONS & RESTRICTIONS**

No environmental permits have been obtained in advance for this Contract. No work can occur on or otherwise impact water or wetland resource areas until all environmental permits have been obtained.

If work to be performed under this contract is within a Wetland and/ or Water Resource Area in accordance with any and all Federal or State laws or regulations, then the Contractor is advised that no work can occur in said work area until all required environmental permitting has been obtained.

Environmental permitting shall be performed by the District 6 Environmental Engineer. The Contractor shall have no claim for additional compensation or damages on account of any delays involved in obtaining necessary environmental permits. The Contractor is hereby notified that he will be responsible to comply with all requirements of said environmental permits obtained under this contract.

The Contractor is further advised that any and all time delays, as a result of filing for and obtaining permits, is not subject to a claim. Also, the Contractor is advised that he/she may be required to submit additional information with respect to proposed work subject to environmental regulations.

The Contractor must be aware of the potential of encountering hazardous materials during excavation and trenching operations. In the event hazardous materials such as, but not limited to, asbestos conduit, contaminated soil and/or contaminated groundwater are encountered, the Contractor must immediately cease the operation, secure the site and notify the Engineer. Disposal of these materials shall be in compliance with State and Federal waste regulations, and in accordance with MassDOT waste handling and disposal Special Provisions, as applicable.

## **NORTHERN LONG-EARED BAT PROTECTION**

The U.S. Fish and Wildlife Service has listed the northern long-eared bat as threatened under the Endangered Species Act (ESA) and the following requirements exist to protect the bat and its habitat. This project has been reviewed by MassDOT Highway Division's Environmental Services Section, and has been determined to have "No Effect" to the northern long-eared bat. No time of year restrictions are required for the project at this time. If additional cutting is proposed by the Contractor that is outside the scope of this contract, additional review is required by the MassDOT Highway Division's Environmental Services Section, and time of year restrictions may apply to such tree cutting.

## **PAYMENT FOR RENTAL EQUIPMENT**

During the course of this contract, conditions may be identified the require equipment that is not a part of an existing pay items. These situations will be defined as-such by the Engineer.

The Contractor must get the authorization of the Engineer before any equipment is rented and shall obtain competitive prices as required by the Engineer.

The Contractor will be paid the actual cost for rental equipment, required for work under this contract, plus a ten (10) percent mark-up.

All rental equipment and tools shall be in good working condition. The Contractor shall not be paid for equipment down time. There shall be no compensation of vehicles used for transportation to and from the Contractor's place of business or any staging area.

The Contractor shall be required to furnish certified paid receipts for all rental equipment that is required prior to payment by MassDOT. The actual cost for rental equipment shall be judged in accordance with the rate specified in the Rental Blue Book and it is the Contractor's responsibility to provide a copy of the Rental Blue Book to MassDOT prior to payment. The rental compensation shall also include the cost of an operator. The rental equipment will be paid on an hourly basis and will not carry any overtime rate after eight hours of operation.

## **PAYMENT FOR SPECIALTY TRADES OR ADDITIONAL ARTISANS**

If the Engineer has knowledge of a materials/equipment rental source of specialty trades or additional artisans, which are competitive with the Contractor's choice(s), then the Contractor may be required to investigate and use the alternate choice.

The Contractor shall be required to furnish certified paid receipts for all specialty contractors or additional artisans that are required prior to payment by MassDOT.

MassDOT reserves the right to provide certified Roadway Flaggers who are MassDOT employees, at the discretion of the Engineer. The Contractor shall not be charged nor compensated for the use of MassDOT employee flaggers. Should the substitution of MassDOT employee flaggers result in the elimination or reduction of payable hours for Item 850.41 Roadway Flagger, the provisions of Subsection 4.06 Increased or Decreased Contract Quantities shall not apply.

This item shall not be subject to renegotiation for any reason under Subsection 4.06 regardless of whether or not this item overruns or underruns.

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## **COST ESTIMATES**

Where the scope of a repair task can be adequately determined and described, the Contractor, when directed by the Engineer, shall submit a Cost Estimate for the repair task. Each Cost Estimate, submitted in writing, shall include an itemized scope of work, a working schedule (including the number of working days and hours worked each day), work procedures and a NOT-TO-EXCEED cost breakdown itemized by the following: the number and type of workers, the number and type of equipment, materials, specialty contractors, additional artisans, engineering services, traffic controls and police, etc. The Cost Estimate submittal must also state if roadway closures and/or bridge closures will be required.

The Engineer will approve each Cost Estimate submittal in writing. A submittal does not guarantee the Contractor will be assigned the work. Payment will be based on actual hours worked at the contractual rates for various items as previously described up to the maximum task amount. Completion of the task is the sole responsibility of the Contractor once the not-to-exceed amount has been reached.

Should unforeseen problems develop during the course of the task completion; the Contractor will submit to the District a revised scope of work with a comparison to the original scope of work along with a breakdown of the additional costs for approval by the Engineer. The Engineer's approval for any increases to the agreed upon not-to-exceed cost will be dependent upon the justification of the additional work.

If the Contractor performs work which is not provided for in this Contract, or which was not authorized in writing by the Engineer, said Contractor shall receive no compensation for such work.

## **ENGINEERING SERVICES COST ESTIMATE**

When engineering designs or other consulting services are deemed necessary by the Engineer, the design firm will submit a cost estimate of the proposed work. This estimate will include the classification, estimated hours needed, and actual hourly rate for each individual anticipated to be used in developing the finished product. The billable rates shall include overhead and profit. Overhead shall be as approved by MassDOT Audit Section or in absence of approved audited rates a maximum 155% shall apply for overhead. The profit fee is 10%. The billable rate shall be calculated using  $1.10 * (\text{Base Hourly Rate} + \text{Base Hourly Rate} * \text{Overhead Rate } \%)$ .

## **SUPPLEMENTAL REQUIREMENTS FOR NON-BID ITEMS**

(Supplementing Subsection 3.04)

The Contractor will be paid for additional artisans, equipment rental, materials, engineering services and specialty services required to perform the work plus (10%) percent, plus actual increased bond premium.

The Contractor shall be required to furnish certified paid receipts for additional artisans, equipment rental, materials, engineering services and specialty services that are required to perform the work prior to payment by the Department. Increased bond premium for additional artisans, equipment rental, materials, engineering services and specialty services will be paid after a certified paid receipt is submitted showing payment of the increased bond.

## **MATERIALS / PARTS**

All materials shall be new and unused, unless otherwise approved by the Engineer. MassDOT may opt to supply materials directly to the Contractor for installation.

The Contractor will be paid his actual cost for materials/parts plus ten (10%) percent. However, no materials shall be ordered until approved by the Engineer and competitive prices may be required if the Engineer directs.

The Contractor shall furnish paid receipts for all materials that are required prior to payment by MassDOT. In support of assigned work (for which no existing contract item exists) the Engineer reserves the right to furnish any materials it deems advisable, and the Contractor shall have no claims for costs and markup on those materials.

## **ENGINEERS EQUIPMENT**

The following shall be provided for the Engineer as incidental to the project and will become the property of the Massachusetts Department of Transportation.

- Twelve three ring binders, one inch thick with clear covers and side pockets
- One set of Project Ledger Covers-with Posts, National model number 94-592 or equivalent

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## **SUBSECTION 8.14 UTILITY COORDINATION, DOCUMENTATION, AND MONITORING RESPONSIBILITIES**

### **A. GENERAL**

In accordance with the provisions of Section 8.00 Prosecution and Progress, utility coordination is a critical aspect to this Contract. This section defines the responsibility of the Contractor and MassDOT, with regard to the initial utility relocation plan and changes that occur as the prosecution of the Work progresses. The Engineer, with assistance from the Contractor shall coordinate with Utility companies that are impacted by the Contractor's operations. To support this effort, the Contractor shall provide routine and accurate schedule updates, provide notification of delays, and provide documentation of the steps taken to resolve any conflicts for the temporary and/or permanent relocations of the impacted utilities. The Contractor shall provide copies to the Engineer of the Contractor communication with the Utility companies, including but not limited to:

- Providing advanced notice, for all utility-related meetings initiated by the Contractor.
- Providing meeting minutes for all utility-related meetings that the Contractor attends.
- Providing all test pit records.
- Request for Early Utility work requirements of this section (see below).
- Notification letters for any proposed changes to Utility start dates and/or sequencing.
- Written notification to the Engineer of all apparent utility delays within seven (7) Calendar Days after a recognized delay to actual work in the field – either caused by a Utility or the Contractor.
- Any communication, initiated by the Contractor, associated with additional Right-of-Way needs in support of utility work.
- Submission of completed Utility Completion Forms.

### **B. PROJECT UTILITY COORDINATION (PUC) FORM**

The utility schedule and sequence information provided in the Project Utility Coordination Form (if applicable) is the best available information at the time of the bid and has been considered in setting the contract duration. The Contractor shall use all of this information in developing the bid price and the Baseline Schedule Submission, inclusive of the individual utility durations sequencing requirements, and any work that has been noted as potentially concurrent utility installations.

### **C. INITIATION OF UTILITY WORK**

The Engineer will issue all initial notice-to-proceed dates to each Utility company based on either the:

- 1) Contractor's accepted Baseline Schedule
- 2) An approved Early Utility Request in the form of an Early Utility sub-net schedule (in accordance with the requirements of this Subsection)
- 3) An approved Proposal Schedule

#### **C.1 - BASELINE SCHEDULE – UTILITY BASIS**

The Contractor shall provide a Baseline Schedule submission in accordance with the requirements of Subsection 8.02 and inclusive of all of the information provided in the PUC Form that has been issued in the Contract documents. This is to include the utility durations, sequencing of work, allowable concurrent work, and all applicable considerations that have been depicted on the PUC Form.



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**SUBSECTION 8.14** (Continued)**C.2 – EARLY UTILITY REQUEST – (aka SUBNET SCHEDULE) PRIOR TO THE BASELINE**

All early utility work is defined as any anticipated/required utility relocations that need to occur prior to the Baseline Schedule acceptance. In all cases of proposed early utility relocation, the Contractor shall present all known information at the pre-construction conference in the form of a ‘sub-net’ schedule showing when each early utility activity needs to be issued a notice-to-proceed. The Contractor shall provide advance notification of this intent to request early utility work in writing at or prior to the Pre-Construction meeting. Prior to officially requesting approval for early utility work, the Contractor shall also coordinate with MassDOT and all utility companies (private, state or municipal) which may be impacted by the Contract. If this request is acceptable to the Utilities and to MassDOT, the Engineer will issue a notice-to-proceed to the affected Utilities, based on these accepted dates.

**C.3 – PROPOSAL SCHEDULE - CHANGES TO THE PUC FORM**

If the Contractor intends to submit a schedule (in accordance with MassDOT Standard Specifications, Division I, Subsection 8.02) that contains durations or sequencing that vary from those provided in the Project Utility Coordination (PUC) Form, the Contractor must submit this as an intended change, in the form of a Proposal Schedule and in accordance with MassDOT Standard Specifications, Division I, Subsection 8.02. These proposed changes are subject to the approval of the Engineer and the impacted utilities, in the form of this Proposal Schedule and a proposed revision to the PUC form. The Contractor shall not proceed with any changes of this type without written authorization from the Engineer, that references the approved Proposal Schedule and PUC form changes. The submission of the Baseline Schedule should not include any of these types of proposed utility changes and should not delay the submission of the Baseline Schedule. As a prerequisite to the Proposal Schedule submission, and in advance of the utility notification(s) period, the Contractor shall coordinate the proposed utility changes with the Engineer and the utility companies, to develop a mutually agreed upon schedule, prior to the start of construction.

**D. UTILITY DELAYS**

The Contractor shall notify the Engineer upon becoming aware that a Utility owner is not advancing the work in accordance with the approved utility schedule. Such notice shall be provided to the Engineer no later than seven (7) calendar days after the occurrence of the event that the Contractor believes to be a utility delay. After such notice, the Engineer and the Contractor shall continue to diligently seek the Utility Owner’s cooperation in performing their scope of Work.

In order to demonstrate that a critical path delay has been caused by a third-party Utility, the Contractor must demonstrate, through the requirements of the monthly Progress Schedule submissions and the supporting contract records associated with Subsections 8.02, 8.10 and 8.14, that the delays were beyond the control of the Contractor.

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**SUBSECTION 8.14** (Continued)

All documentation provided in this section is subject to the review and verification of the Engineer and, if required, the Utility Owner. In accordance with MassDOT Specifications, Division I, Subsection 8.10, a Time Extension will be granted for a delay caused by a Utility, only if the actual duration of the utility work is in excess of that shown on the Project Utility Coordination Form, and only if;

- 1) proper Notification of Delay was provided to MassDOT in accordance with the time requirements that are specified in this Section
- 2) the utility delay is a critical path impact to the Baseline Schedule (or most recently approved Progress Schedule)

**E. LOCATION OF UTILITIES**

The locations of existing utilities are shown on the Contract drawings as an approximation only. The Contractor shall perform a pre-construction utility survey, including any required test pits, to determine the location of all known utilities no later than thirty (30) calendar days before commencing physical site work in the affected area.

**F. POST UTILITY SURVEY – NOTIFICATION**

Following completion of a utility survey of existing locations, the Contractor will be responsible to notify the Engineer of any known conflicts associated with the actual location of utilities prior to the start of the work. The Engineer and the Contractor will coordinate with any utility whose assets are to be affected by the Work of this Contract. A partial list of utility contact information is provided in the Project Utility Coordination Form.

**G. MEETINGS AND COOPERATION WITH UTILITY OWNERS**

The Contractor shall notify the Engineer in advance of any meeting they initiate with a Utility Owner's representative to allow MassDOT to participate in the meeting if needed.

Prior to the Pre-Construction Meeting, the Contractor should meet with all Utility Owners who will be required to perform utility relocations within the first 6 months of the project, to update the affected utilities of the Project Utility Coordination Form and all other applicable Contract requirements that impact the Utilities. The Contractor shall copy the Engineer on any correspondence between the Utility Owner and the Contractor.

**H. FORCE ACCOUNT / UTILITY MONITORING REQUIREMENTS**

The Engineer will be responsible for recording daily Utility work force reports. The start, suspension, re-start, and completion dates of each of the Utilities, within each phase of the utility relocation work, will be monitored and agreed to by the Engineer and the Contractor as the work progresses.

**I. ACCESS AND INSPECTION**

The Contractor shall be responsible for allowing Utility owners access to their own utilities to perform the relocations and/or inspections. The Contractor shall schedule their work accordingly so as not to delay or prevent each utility from maintaining their relocation schedule.

**SUBSECTION 8.02 SCHEDULE OF OPERATIONS**

Replace this subsection with the following:

An integrated cost and schedule controls program shall be implemented by the Contractor to track and document the progress of the Work from Notice to Proceed (NTP) through the Contractor Field Completion (CFC) Milestone. The Contractor's schedules will be used by the Engineer to monitor project progress, plan the level-of-effort required by the Department's work force and consultants and as a critical decision-making tool. Accordingly, the Contractor shall ensure that it complies fully with the requirements specified herein and that its schedules are both accurate and updated as required by the specification throughout the life of the project. Detailed requirements are provided in Division II, Section 722 Construction Scheduling.

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## SECTION 722 CONSTRUCTION SCHEDULING

### DESCRIPTION

#### 722.20      **General**

The Contractor's approach to prosecution of the Work shall be disclosed to the Department by submission of a Critical Path Method (CPM) schedule and a cost/resource loaded Construction Schedule when required in this Subsection. These requirements are in addition to, and not in limitation of, requirements imposed in other sections.

The requirements for scheduling submissions are established based on the Project Value at the time of the bid and are designated as Type A, B, C or D. The definitions of these Schedule Requirement Types are summarized below. Complete descriptions of all detailed requirements are established elsewhere in this specification.

**Type A** – for all Site-Specific Contracts with a Project Value over \$20 Million

- Schedule Planning Session
- Baseline CPM Schedule
- Monthly Update CPM Schedule
- Short-term Construction Schedule
- Contract Schedule Update Meeting
- Resource-Loading
- Resources Graphic Reporting
- Cash Flow Projections from the CPM
- Cash Flow Charts
- Cost-loaded CPM
- Contractor-furnished CPM software, computer and training

**Type B** – for all Site-Specific Contracts with a Project Value between \$10 Million and \$20 Million

- Schedule Planning Session
- Baseline CPM Schedule
- Monthly Update CPM Schedule
- Short-term Construction Schedule
- Contract Schedule Update Meeting
- Cost-loaded CPM
- Resource-Loading
- Monthly Projected Spending Report (PSR)
- Contractor-furnished CPM software, computer and training

**SECTION 722 (Continued)**

**Type C** – for all Site-Specific Contracts with a Project Value between \$3 Million and \$10 Million

- Schedule Planning Session
- Baseline CPM Schedule
- Monthly Update CPM Schedule
- Short-term Construction Schedule
- Contract Schedule Update Meeting
- Monthly Projected Spending Report (PSR)
- Contractor-furnished CPM software, computer and training

**Type D** - for all contracts with a Project Value less than \$3 Million; various locations contracts of any dollar amount; contracts with durations less than one-hundred and eighty (180) Calendar Days; and other contracts as determined by the Engineer.

- Bar chart schedule updated monthly or at the request of the Engineer (See Section 722.62.B - Bar Charts.)
- Monthly Projected Spending Report (PSR) (See Section 722.62.F - Projected Spending Reports.)

**MATERIALS, EQUIPMENT, PERSONNEL****722.40 General****A. Software Requirements** (Types A, B and C)

The Contractor shall use Primavera P6 computer scheduling software.

In addition to the requirements of Section 740 – Engineer’s Field Office and Equipment, the Contractor shall provide to the Department one (1) copy of the scheduling software, one (1) software license and one (1) computer capable of running the scheduling software for the duration of the Contract. This computer and software shall be installed in the Engineer’s Field Office within twenty-eight (28) Calendar Days after Notice to Proceed. The computer and software shall be maintained and serviced as recommended by the computer manufacturer and/or as required by the Engineer during the duration of the Contract at no additional cost to the Department. The Contractor shall provide professional training in the basic use of the software for up to eight (8) Department employees. The trainer shall be approved by the Engineer. This training shall be provided within twenty-eight (28) Calendar Days after Notice to Proceed.

**B. Scheduler Requirements**

For all schedule types, if the Contractor plans to use outside scheduling services, the scheduler shall be approved as a subcontractor by the Engineer.

For Type A, B and C Schedules the name of the Contractor’s Project Scheduler together with his/her qualifications shall be submitted to the Department for approval by the Engineer within seven (7) Calendar Days after NTP. The Project Scheduler shall have a minimum of five [5] years of project CPM scheduling experience, three [3] years of which shall be on projects of similar scope and value as the project for which the Project Scheduler is being proposed. References shall be provided from past projects that can attest to the capabilities of the Project Scheduler.

**SECTION 722 (Continued)****CONSTRUCTION METHODS****722.60 General****A. Schedule Planning Session**  
(Types A, B and C)

The Contractor shall conduct a schedule planning session within seven (7) Calendar Days after the Contractor receives the NTP and prior to submission of the Baseline Schedule. This session will be attended by the Department and its consultants. During this session, the Contractor shall present its planned approach to the project including, but not limited to:

1. the Work to be performed by the Contractor and its subcontractors;
2. the planned construction sequence and phasing; planned crew sizes;
3. summary of equipment types, sizes, and numbers to be used for each work activity;
4. all early work related to third party utilities;
5. identification of the most critical submittals and projected submission timelines;
6. estimated durations of major work activities;
7. the anticipated Critical Path of the project and a summary of the activities on that Critical Path;
8. a summary of the most difficult schedule challenges the Contractor is anticipating and how it plans to manage and control those challenges;
9. a summary of the anticipated quarterly cash flow over the life of the project.

This will be an interactive session and the Contractor shall answer all questions that the Department and its consultants may have. The Contractor shall provide a minimum of five (5) copies of a written summary of the information presented and discussed during the session to the Engineer. The Contractor's Baseline Schedule and accompanying Schedule Narrative shall incorporate the information discussed at this Schedule Planning Session.

**B. Schedule Reviews by the Department (All Types)****1. Baseline Schedule Reviews**

The Engineer will respond to the Baseline Schedule Submission within thirty (30) Calendar Days of receipt providing comments, questions and/or disposition that either accepts the schedule or requires revision and resubmittal. Baseline Schedules shall be resubmitted within fifteen (15) Calendar Days after receipt of the Engineer's comments.

**2. Contract Progress Schedule / Monthly Update Reviews**

The Engineer will respond to each submittal within twenty one (21) Calendar Days. Schedules shall be resubmitted by the Contractor within five (5) Calendar Days after receipt of the Engineer's comments.

Failure to submit schedules as and when required could result in the withholding of full or partial pay estimate payments by the Engineer.

**SECTION 722 (Continued)****722.61 Schedule Content and Preparation Requirements**  
(Types A, B and C unless otherwise noted)

Each Contract Progress Schedule shall fully conform to these requirements.

**A. LOGIC**

The schedules shall divide the Work into activities with appropriate logic ties to show:

1. conformance with the requirements of this Section and Division I, Subsection 8.02 - Schedule of Operations
2. the Contractor's overall approach to the planning, scheduling and execution of the Work
3. conformance with any additional sequences of Work required by the Contract Documents, including, but not limited to, Subsection 8.03 - Prosecution of Work and Subsection 8.06 – Limitations of Operations.

**B. ACTIVITIES**

The schedules shall clearly define the progression of the Work from NTP to Contractor Field Completion (CFC) by using separate activities for each of the following items:

1. NTP
2. Each component of the Work defined by specific activities
3. Detailed activities to satisfy permit requirements
4. Procurement of fabricated materials and equipment with long lead times, including time for review and approval of submittals required before purchasing
5. The preparation and submission of shop drawings, procedures and other required submittals, with a planned duration that is to be demonstrated to the Engineer as reasonable
6. The review and return of shop drawings, procedures and other required submittals, approved or with comments, the duration of which shall be thirty (30) Calendar Days, unless otherwise specified or as approved by the Engineer
7. Interfaces with adjacent work, utility companies, other public agencies, sensitive abutters, and/or any other third party work affecting the Contract
8. The Critical Path, clearly defined and organized
9. Float shall be clearly identified
10. Access Restraints – restrictions on access to areas of the Work that are defined by the Department in the bid package, in Subsection 8.06 – Limitations of Operations or elsewhere in the Contract
11. Milestones listed in Subsection 8.03 - Prosecution of Work or elsewhere in the Contract Documents
12. Subcontractor approvals at fifteen (15) Calendar Days from submittal to response
13. Full Beneficial Use (FBU) Contract Milestone per the requirements of Subsection 8.03 - Prosecution of Work
14. Contractor's request for validation of FBU (ready to open to traffic)
15. The Department's confirmation of completed work to allow for FBU

**SECTION 722 (Continued)**

16. Substantial Completion Contract Milestone per the requirements of Subsections 7.15 - Claims Against Contractors for Payment of Labor, Materials and Other Purposes and 8.03 - Prosecution of Work
17. Contractor's request for validation of Substantial Completion
18. Punchlist Completion Period of at least thirty (30) Calendar Days per the requirements of Subsections 5.11 - Final Acceptance, 7.15 - Claims Against Contractors for Payment of Labor, Materials and Other Purposes and 8.03 - Prosecution of Work
19. Contractor confirmation that all punchlist work and documentation has been completed
20. Physical Completion of the Work Contract Milestone per the requirements of Subsections 5.11 - Final Acceptance and 8.03 - Prosecution of Work
21. Documentation Completion per the requirements of Subsections 5.11 - Final Acceptance and 8.03 - Prosecution of Work
22. Contractor Field Completion Contract Milestone per the requirements of Subsections 5.11 - Final Acceptance and 8.03 - Prosecution of Work
23. Utility work to be performed in accordance with the Project Utility Coordination (PUC) Form as provided in Section 8.14 - Utilities Coordination, Documentation and Monitoring Responsibilities
24. Traffic work zone set-up and removal, night work and phasing
25. Early Utility Relocation (by others) that has been identified in the Contract
26. Right-of-Way (ROW) takings that have been identified in the Contract
27. Material Certifications
28. Work Breakdown Structure in accordance with the MassDOT-Highway Division Contractor Construction Schedule Toolkit located on the MassDOT-Highway Division website at:  
<https://www.mass.gov/info-details/massdot-highway-contractors-schedule-toolkit>
29. For Type A and B Contracts only: All items to be paid, including all Unit Price and Lump Sum pay items, shall be identified by activity. This shall include all non-construction activities such as engineering work; purchase of permanent materials and equipment, purchase of structural steel stock, equipment procurement, equipment delivery to the site or storage location and the representative amount of overhead/indirect costs that was included in the Contractor's Bid Prices.

**C. EARLY AND LATE DATES**

Early Dates shall be based on proceeding with the Work or a designated part of the Work exactly on the date when the corresponding Contract Time commences. Late Dates shall be based on completing the Work or a designated part of the Work exactly on the corresponding Contract Time, even if the Contractor anticipates early completion.



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**SECTION 722 (Continued)****D. DURATIONS**

Activity durations shall be in Work Days. Planned Original Durations shall be established with consideration to resources and production rates that correspond to the Contractor's Bid Price. Within all of the Department-required schedules, the Contractor shall plan the Work using durations for all physical construction activities of no less than one (1) Work Day and no greater than fourteen (14) Work Days, unless approved by the Engineer as part of the Baseline Schedule Review.

Should there be an activity with a duration that is determined by the Engineer to be unreasonable, the Contractor will be asked to provide a basis of the duration using bid documents, historic production rates for similar work, or other form of validation that is acceptable to the Engineer. Should the Contractor and the Engineer be unable to agree on reasonable activity durations, the Engineer will, at a minimum, note the disagreement in the Baseline Schedule Review along with a duration the Engineer considers reasonable and the basis for that duration. A schedule that contains a substantial number of activities with durations that are deemed unreasonable by the Engineer will not be accepted.

**E. MATERIALS ON HAND (for Types A and B only)**

The Contractor shall identify in the Baseline Schedule all items of permanent materials (Materials On Hand) for which the Contractor intends to request payment prior to the incorporation of such items into the Work.

**F. ACTIVITY DESCRIPTIONS**

The Contractor shall use activity descriptions in all schedules that clearly describe the work to be performed using a combination of words, structure numbers, station numbers, bid item numbers, work breakdown structure (WBS) and/or elevations in a concise and compact label as specified in the MassDOT-Highway Division Contractor Construction Schedule Toolkit located on the MassDOT-Highway Division website at:

<https://www.mass.gov/info-details/massdot-highway-contractors-schedule-toolkit>

**G. ACTIVITY IDENTIFICATION NUMBERS**

The Contractor shall use the activity identification numbering system specified in the MassDOT-Highway Division Contractor Construction Schedule Toolkit located online at the address above.

**H. ACTIVITY CODES**

The Contractor shall use the activity codes specified in the MassDOT-Highway Division Contractor Construction Schedule Toolkit located online at the address above.

**I. CALENDARS**

Different calendars may be created and assigned to all activities or to individual activities. Calendars define the available hours of work in each Calendar Day, holidays and general or project-specific non-Work Days such as Fish Migration Periods, time of year (TOY) restrictions and/or area roadway restrictions.

## SECTION 722 (Continued)

Examples of special calendars include, but are not limited to:

- Winter Shutdown Period, specific work is required by separate special provision to be performed during the winter. See Special Provision 8.03 (if applicable)
- Peak traffic hours on heavily traveled roadways. This shall be from 6:30 am to 9:30 am and from 3:30 pm to 7:00 pm, unless specified differently elsewhere in the Contract.
- Special requirements by sensitive abutters, railroads, utilities and/or other state agencies as defined in the Contract.
- Cape Cod and the Islands Summer Roadway Work Restrictions: A general restriction against highway and bridge construction is enforced between Memorial Day and Labor Day, unless otherwise directed by the Engineer. Refer to the Project Special Provisions for specific restrictions.
- Cape Ann Summer Roadway Work Restrictions: While there are no general restrictions for Cape Ann as there are for Cape Cod and the Islands, project-specific restrictions may be enforced. Refer to the Project Special Provisions for specific restrictions.
- Turtle and/or Fish Migration Periods and/or other in-water work restrictions: Refer to the Project Special Provisions for specific restrictions.
- Working over Waterways Restricted Periods: Refer to the Project Special Provisions for specific restrictions.
- Night-time paving and striping operations, traffic and temperature restrictions: Refer to the Project Special Provisions for specific restrictions.
- Utility Restrictions shall be as specified within the Contract.

### J. FLOAT

For the calculation of float in the CPM schedule, the setting for *Retained Logic* is required for all schedule submissions, starting with the Baseline Schedule Submission. Should the Contractor have a reason to propose that an alternative calculation setting such as *Progress Override* be used, the Contractor shall obtain the Engineer's approval prior to modifying to this setting.

### K. COST AND RESOURCE LOADING (Types A and B only)

For all Type A and B Schedules, the Contractor shall provide a cost and resource-loaded schedule with an accurate allocation of the costs and resources necessary to complete the Work. The costs and resources shall be assigned to all schedule activities in order to enable the Contractor to efficiently execute the Contract requirements and the Engineer to validate the original plan, monitor progress, provide cash flow projections and analyze delays.

1. Each schedule activity shall have an assigned cost that accurately represents the value of the Work. Each schedule activity shall have its resources assigned to it by craft and the anticipated hours to accomplish the work. Each schedule activity's equipment resources shall be assigned to it by equipment type and hours operated. Front-loading or other unbalancing of the cost distribution will not be permitted.
2. The sum of the cost of all schedule activities shall be equal to the Contractor's Bid Price.
3. Indicating the labor hours per individual, per day, by craft and equipment hours/day will be acceptable.

**SECTION 722 (Continued)**

4. The Engineer reserves the right to use the cost-loading as a means to resolve changes, disputes, time entitlement evaluations, increases or decreases in the scope of Work, unit price renegotiations and/or claims.
5. For all Type A and B Schedules, all subnets, fragnets, Proposal Schedules, and Recovery Schedules shall be cost and resource- loaded to help to quickly validate and monitor the duration of the Work to be performed.
6. For Type A Schedules, cost-loading of the schedule will also be used for cash flow projection purposes.
7. The cost-loading of each activity shall indicate the portion of the cost for that activity that is applicable to a specific bid item (cost account.) The total cost for each cost account must equal the bid item price.
8. For Type A Schedules, each month, the Contractor will be paid using the Cost-loaded CPM activities for Lump Sum payment items. This requirement supersedes any requirements elsewhere in this Contract regarding partial payments of schedule-of-values for all Lump Sum items.

**L. NOT TO BE USED IN THE CONTRACTOR'S CPM SCHEDULE**

1. Milestones or constraint dates not specified in the Contract
2. Scheduled work not required for the accomplishment of a Contract Milestone
3. Use of activity durations, logic ties and/or sequences deemed unreasonable by the Engineer
4. Delayed starts of follow-on trades
5. Float suppression techniques

**722.62 Submittal Requirements**

All schedules shall be prepared and submitted in accordance with the requirements listed below.

Each monthly Contract Progress Schedule submittal shall be uniquely identified.

Except as stated elsewhere in this subsection, schedule submittals shall include each of the documents listed below, prepared in two formats, for distribution as follows:

- a. four (4) compact discs (CD); one (1) each for the Office of Project Controls and Performance Oversight (O-PC&PO), the Boston Construction Section Office, the District Construction Office and the Resident Engineer's Office. Additional copies shall be required if the work is performed in more than one district.
- b. two (2) hard copies plotted in color on 24" X 36" paper; one (1) copy each for the District Construction Office and the Resident Engineer's Office. No copies for the O-PC&PO and the Boston Construction Section Office. Additional copies shall be required if the work is performed in more than one district.

**SECTION 722 (Continued)****A. Narratives**

A written narrative shall be submitted with every schedule submittal. The narrative shall:

1. itemize and describe the flow of work for all activities on the Critical Path in a format that includes any changes made to the schedule since the previous Contract Progress Schedule / Monthly Update or the Baseline Schedule, whichever is most recent;
2. provide a description of any specification requirements that are not being followed. Identify those that are improvements and those that are not considered to be meeting the requirements;
3. provide all references to any Notice of Delay that has been issued, within the time period of the Contract Progress Schedule Update, by letter to the Engineer. Note that any Notice of Delay that is not issued by letter will not be recognized by the Engineer. See Subsection 722.64.A - Notice of Delay;
4. provide a description of each third-party utility's planned vs. actual progress and note any that are trending late or are late per the durations and commitments as provided in the PUC Form; provide a description of the five (5) most important responses needed from the Department and the need date for the responses in order to maintain the current Schedule of Record;
5. provide a description of all critical issues that are not within the control of the Contractor or the Department (third party) and any impact they had or may have on the Critical Path;
6. provide a description of any possible considerations to improve the probability of completing the project early or on-time;
7. compare Early and Late Dates for activities on the Critical Path and describe reasons for changes in the top three (3) most critical paths ;
8. describe the Contractor's plan, approach, methodologies and resources to be employed for completing the various operations and elements of the Work for the top three (3) most critical paths. For update schedules, describe and propose changes to those plans and verify that a Proposal Schedule is not required;
9. describe, in general, the need for shifts that are not 5 days/week, 8 hours/day, the holidays that are inserted into each calendar and a tabulation of each calendar that has been used in the schedule;
10. describe any out-of-sequence logic and provide an explanation of why each out-of-sequence activity does not require a correction, if one has not been provided, and an adequate demonstration that these changes represent the basis of how these activities will be built, including considerations for resources, dependencies and previously-approved production rates;
11. identify any possible duration increases resulting from actual or anticipated unit price item quantity overruns as compared to the baseline duration, with a corresponding suggestion to mitigate any possible delays to the Critical Path. If the delay is anticipated to impact the Critical Path, refer to Subsections 4.06 - Increased or Decreased Contract Quantities and 8.10 - Determination and Extension of Contract Time for Completion and submit a letter to the Engineer notifying of a potential delay;
12. include a schedule log consisting of the name of the schedule, the data date and the date submitted.

**SECTION 722 (Continued)****B. Bar Charts (Types A, B, C and D)**

One (1) time-scaled bar chart containing all activities shall be prepared and submitted using a scale that yields readable plots and that meets the requirements of Subsection 722.61 - Schedule Content and Preparation Requirements. Activities shall be linked by logic ties and shown on their Early Dates. Critical Paths shall be highlighted and Total Float shall be shown for all activities.

A second time-scaled bar chart shall also be prepared containing only the Critical Path or, if the Critical Path is not the longest path, the Longest Path using a scale that yields readable plots and that meets the requirements of Subsection 722.61 - Schedule Content and Preparation Requirements. Activities shall be linked by logic ties and shown on their Early Dates. Total Float shall be shown for all activities.

Bar Charts shall be printed in color and submitted on 11" X 17" paper or, if approved by the Engineer, as a .pdf file.

**C. Detailed Activity Schedule Comparisons**

A Detailed Activity Schedule Comparison (DASC) is a simple reporting tool in the format of a graphical report that will provide Resident Engineers with immediate, timely and up-to-date information. The DASC consists of an updated bar chart that overlays the current time period's bar chart onto the previous time period's bar chart for an easily-read comparison of progress during the present and previous reporting periods. The DASC shall be prepared and submitted in accordance with the instructions contained in the Construction Schedule Toolkit located on the MassDOT-Highway Division website at:

<https://www.mass.gov/info-details/massdot-highway-contractors-schedule-toolkit>

The reports described in Subsections D, E and F below shall be submitted with all of the schedules listed in Subsection 722.20 - General:

**D. Activity Cost Report and Monthly Cash Flow Projections (Type A only)**

With each Contractor Quantity Estimate (CQE), the Contractor shall submit an Activity Cost Report and Cash Flow Projection that includes all activities grouped by Contract Bid Item.

The Activity Cost Report shall be generated from the Schedule of Record and shall be the basis of the Monthly Cash Flow Projection. Within each contract Bid Item, activities shall be sequenced by ascending activity identification number and shall show:

1. activity ID and description,
2. forecast start and finish dates for each activity and,
3. when submitted as a revised schedule, actual start and finish dates for each completed activity.

For Unit Price pay items, in addition to the above, estimates to complete and any variance to the estimated Contract quantity shall be shown.

**E. Resource Graphs (Type A only)**

Monthly and cumulative resource graphs for the remaining Contract period using the Early Dates and Late Dates in the Contract Progress Schedule shall be included as part of each schedule submittal.

**SECTION 722 (Continued)****F. Projected Spending Reports (Types B, C and D)**

A Projected Spending Report (PSR) shall be prepared and submitted in accordance with the instructions listed at the end of this section. The PSR shall indicate the monthly spending (cash flow) projection for each month from NTP to Contractor Field Completion (CFC). Each month's actual spending shall be calculated using all CQEs paid during that month. If the difference between the Contractor's monthly projections vs. the actual spending is greater than 10%, the Contractor's monthly spending projection shall be revised and resubmitted within fifteen (15) Calendar Days.

The Projected Spending Report (PSR) shall be depicted in a tabular format and printed in color on 11 x 17-sized paper or larger as approved by the Engineer. For additional instructions and a template for preparing the Projected Spending Report (PSR), refer to the Contractor's Construction Schedule Toolkit located on the MassDOT-Highway Division website at: <https://www.mass.gov/info-details/massdot-highway-contractors-schedule-toolkit> or consult with the District Construction Scheduler.

**722.63. Progress Schedule Requirements****A. Baseline Schedule**

The Baseline Schedule shall be due thirty (30) Calendar Days after Notice to Proceed (NTP.) The Baseline Schedule shall only reflect the Work awarded to the Contractor and shall not include any additional work involving Extra Work Orders or any other type of alleged delay. The Baseline Schedule shall be prepared and submitted in accordance with Subsections 722.61 - Schedule Content and Preparation Requirements and 722.62 - Submittal Requirements. Once the Baseline Schedule has been accepted by the Engineer, with or without comments, it shall represent the as-planned schedule for the Work and become the Contract Progress Schedule of Record until such time as the schedule is updated or revised under Subsections 722.63.C - Contract Progress Schedules / Monthly Updates, 722.64.C - Recovery Schedules and 722.64.D - Proposal Schedules.

The Cost and Resource-Loading information (Types A and B only) shall be provided by the Contractor within forty-five (45) Calendar Days after NTP.

The Engineer's review comments on the Baseline Schedule and the Contractor's responses to them will be maintained for the duration of the Contract and will be used by the Engineer to monitor the Contractor's work progress by comparing it to the Contract Progress Schedule / Monthly Update.

**B. Interim Progress-Only Schedule Submissions**

The first monthly update of the Contract Progress Schedule/Monthly Update is due within seventy (70) Calendar Days after Notice to Proceed (NTP.) The Baseline Schedule review period ends at sixty (60) Calendar Days after NTP, see Subsection 722.60.B - Schedule Reviews by the Department. If the Baseline Schedule has not been accepted within sixty (60) Calendar Days after NTP, an Interim Progress-Only Schedule shall be due within seventy (70) Calendar Days after NTP. The purpose of the Interim Progress-Only Schedule is to document the actual progress of all activities, including non-construction activities, from NTP until the Baseline Schedule is accepted.

**SECTION 722 (Continued)****C. Contract Progress Schedules / Monthly Updates (Types A, B, C and D)**

The first Contract Progress Schedule shall be submitted by the Contractor no later than seventy (70) Calendar Days after NTP. The data date for this first Progress Schedule shall be sixty (60) Calendar Days after NTP. Subsequent Progress Schedules shall be submitted monthly.

Each Contract Progress Schedule shall reflect progress up to the data date. Updated progress shall be limited to as-built sequencing and as-built dates for completed and in-progress activities. As-built data shall include actual start dates, remaining Work Days and actual finish dates for each activity, but shall not change any activity descriptions, the Original Durations, or the Original Resources (as planned at the time of bid), without the acceptance of the Engineer. If any activities have been completed out-of-sequence, the Contractor shall propose new logic ties for affected in-progress and future activities that accurately reflect the previously-approved sequencing. Alternatively, the Contractor may submit to the Engineer for approval an explanation of why an out-of-sequence activity does not require a correction and an adequate demonstration that the changes accurately represent how the activities will be built, including considerations for resources, dependencies and previously approved production rates. Once approved by the Engineer, the Contractor may incorporate the changes in the next Contract Progress Schedule/Monthly Update with the affected activities clearly identified and explained in the Schedule Narrative.

No revisions to logic ties; sequence, description or duration of future activities; or planned resource costs shall be made without prior approval by the Engineer.

Any proposed logic changes for in-progress or future activities shall be submitted to the Engineer for approval before being incorporated into a Contract Progress Schedule. The logic changes must be submitted using a Proposal Schedule or a schedule fragnet submission. Once approved by the Engineer, the Contractor may incorporate the logic in the next Contract Progress Schedule/Monthly Update with the affected activities clearly identified and explained in the Schedule Narrative.

For any proposed changes to the original sequence, description or duration of future activities, the Contractor shall submit to the Engineer for approval an explanation of how the proposed description or duration change reflects how the activity will be progressed, including considerations for resources and previously approved production rates. Any description or duration change that does not accurately reflect how the activity will be progressed will not be approved by the Engineer. Once approved by the Engineer, the Contractor may incorporate the changes in the next Contract Progress Schedule/Monthly Update with the affected activities clearly identified and explained in the Schedule Narrative.

Except as otherwise designated by a Contract Modification, no Contract Progress Schedule that extends performance beyond the Contract Time and/or beyond any Contract Milestone shall be approved by the Engineer. The Contractor shall submit a Recovery Schedule if any Contract Progress Schedule/Monthly Update indicates a failure to meet the Contract Dates.

**D. Short-Term Construction Schedule**

The Contractor shall provide a Short-Term Construction Schedule that details daily work activities, including any multiple shift work that the Contractor intends to conduct, in a bar chart format. The daily activities shall directly correspond to the Contract Progress Schedule activities, with a matching reference to the activity identification number in the Contract Progress Schedule, and may be at a greater level of detail.

## **SECTION 722 (Continued)**

The Short-Term Construction Schedule shall be submitted every two weeks. It shall display all work for a thirty-five (35) Calendar Day period consisting of completed work for the two (2) week period prior and all planned work for the following three (3) week period. The initial submission shall be provided no later than thirty (30) Calendar Days after NTP or as required by the Engineer.

The Contractor shall be prepared to discuss the Short-Term Construction Schedule, in detail, with the Engineer in order to coordinate field inspection staff requirements, the schedule of work affecting abutters and any corresponding work with affected utilities. Short-Term Construction Schedules shall be prepared and submitted in accordance with Subsections 722.61 - Schedule Content and Preparation Requirements and 722.62 - Submittal Requirements.

Failure to submit Short-Term Construction Schedules every two (2) weeks may result in withholding of full or partial payments by the Engineer.

### **722.64 Impacted Schedule Requirements**

#### **A. Notice of Delay**

The Contractor shall notify the Engineer in writing, with copies to the District and State Construction Engineers, within three (3) Calendar Days of the start of any delays to the Critical Path that are caused by actions or inactions that were not within the control of the Contractor. Delay notifications that are not provided in a letter to the Engineer, such as a delay notification in the schedule narrative, will not be recognized as contractual notice in the determination of any Time Extension related to the impacts to the work associated with this specific alleged delay. Should such delay continue for more than one (1) week, the Contractor shall note it in the Schedule Narrative until the delay is no longer impacting the Critical Path for the completion of the Contract Milestones. The Engineer will evaluate the alleged delay and its impact and will respond to the Contractor within ten (10) Calendar Days after receipt of a notice of delay.

#### **B. Time Entitlement Analysis**

A Time Entitlement Analysis (TEA) shall consist of a descriptive narrative, prepared in accordance with Subsection 722.62.A - Narratives, and an as-built CPM schedule, which may be in the form of a schedule fragnet ( that has been developed from the project's Contract Progress Schedule of Record, and illustrates the impact of a delay to the Critical Path, Contract Milestones and/or Contract Completion Date as required in Subsection 8.10 - Determination and Extension of Contract Time for Completion. TEAs shall also be used to determine the schedule impact of proposed Extra Work Orders (EWO) as also required in Subsection 8.10.

TEAs shall be prepared and submitted in accordance with the requirements of Subsections 722.61 - Schedule Content and Preparation Requirements and 722.62 - Submittal Requirements and shall be based on the Contract Progress Schedule of Record applicable at the start of the delay or impact from an EWO. A TEA fragnet must start with a specific new activity describing the work contained in either a Notice of Delay previously submitted to the Department per Subsection 722.64.A - Notice of Delay or an EWO.



**SECTION 722 (Continued)**

TEAs shall be submitted:

1. as part of any Extra Work Order that may impact Contract Time,
2. with a request for a Time Extension,
3. within fourteen (14) Calendar Days after a request for a TEA by the Engineer for any other reason.

A TEA shall be submitted to the Engineer before any Time Extension is granted to the Contractor. Time Extensions will not be granted unless the TEA accurately reflects an evaluation of all past delays and the actual events that occurred that impacted the Critical Path. The TEA must also demonstrate a plan for the efficient completion of all of the remaining work through an optimized CPM Schedule. The analysis shall include all delays, including Contractor-caused delays, and shall be subdivided into timeframes and causes of delays.

TEAs shall incorporate any proposed activities, logic ties, resource considerations, and activity costs required to most efficiently demonstrate the schedule impacts in addition to detailing all impacts to existing activities, logic ties, the Critical Path, Contract Milestones and the Contract Completion Date. In addition, TEAs shall accurately reflect any changes made to activities, logic ties, restraints and activity costs, necessitated by an Extra Work Order or other schedule impact, for the completion of the remaining work. The Contractor shall provide TEAs that demonstrate that all delays have been mitigated to the fullest extent possible without requiring an Equitable Adjustment to the original bid basis.

All TEAs shall clearly indicate any overtime hours, additional shifts and the resource that are proposed to be incorporated in the schedule. The Engineer shall have final discretion over the use of overtime hours and additional shifts. The Engineer shall have the right to require that overtime hours and/or additional shifts be used to minimize the duration of Time Extensions if it is determined to be in the best interest of the Department to do so.

When accepted, the changes included in a TEA shall be incorporated into the next Contract Progress Schedule per the requirements of Subsection 722.63.C - Contract Progress Schedules / Monthly Updates.

During the review of any TEA, all Contract Progress Schedules shall continue to be submitted as required.

The Engineer may request that the Contractor prepare a Proposal Schedule or a Recovery Schedule to further mitigate any delays that are shown in the accepted TEA/Contract Progress Schedule.

**C. Recovery Schedules**

The Contractor shall promptly report to the Engineer all schedule delays during the prosecution of the Work. Except as otherwise designated by a Contract Modification, no Contract Progress Schedule that extends performance beyond the Contract Time and/or beyond any Contract Milestone shall be approved by the Engineer. The Contractor shall submit a Recovery Schedule within fourteen (14) Calendar Days of a Contract Progress Schedule submission that shows failure to meet the Contract Dates. This requirement is critical to the Department's ability to make informed decisions regarding Contract Time and costs.

**SECTION 722 (Continued)**

During the prosecution of the Work, should the Contractor's progress on a critical operation clearly not meet anticipated production, without cause by fault of the Department, or should a critical activity or series of activities not be staffed in accordance with the Contractor's approved Baseline Schedule resource planning, the Contractor shall be obligated to recover such delay. Recovery Schedules shall be prepared and submitted in accordance with Subsections 722.61 - Schedule Content and Preparation Requirements and 722.62 - Submittal Requirements within fourteen (14) Calendar Days of any of the cases listed above.

Recovery Schedules shall clearly indicate any proposed overtime hours, additional shifts, and the resources that are proposed to be incorporated in to the schedule. The Engineer shall have final discretion over the use of overtime hours and additional shifts and shall have the right to require that overtime hours and/or additional shifts be used to minimize the duration of Time Extensions, without additional compensation for any Contractor delays, if it is determined to be in the best interest of the Department to do so.

During the review of any Recovery Schedule, all Contract Progress Schedules shall continue to be required every month.

The Engineer may request that the Contractor prepare a Recovery Schedule to further mitigate any delays that are shown in an accepted TEA/Contract Progress Schedule.

Changes represented in accepted Recovery Schedules shall be incorporated into the next Contract Progress Schedule.

**D. Proposal Schedules**

A Proposal Schedule is an alternative schedule used to evaluate proposed changes to the Contract scope or significant alternatives to previously approved approaches to complete the Work, which may include changes to activity durations, logic and sequence. For Types A and B Schedules, the Proposal Schedule shall be cost and resource-loaded.

A Proposal Schedule may be requested by the Department at any time or may be offered by the Contractor. The Engineer may request that the Contractor prepare a Proposal Schedule to further mitigate any delays that are shown in an accepted TEA/Contract Progress Schedule.

The Contractor shall submit the Proposal Schedule within thirty (30) Calendar Days of a request from the Department.

The Proposal Schedule shall not be considered a Schedule of Record until the logic, durations, narrative and basis of the Proposal Schedule have been accepted by the Engineer. If the Proposal Schedule took the form of a fragnet, it must be incorporated into the Contract Progress Schedule of Record showing the current progress of all other activities and the impacts/results of the changes made by the Proposal Schedule before the Proposal Schedule is accepted by the Department.

Proposal Schedules shall clearly indicate any proposed overtime hours, additional shifts, and the resources that are proposed to be incorporated in the schedule. The Engineer shall have final discretion over the use of overtime hours and additional shifts.

Changes represented in accepted Proposal Schedules shall be incorporated into the next Contract Progress Schedule. During the review of any Proposal Schedule, all Contract Progress Schedules shall continue to be required every month.

**SECTION 722 (Continued)****E. Disputes (Types A, B, C and D)**

All schedules shall be submitted, reviewed, dispositioned and accepted in the timely manner specified herein so as to provide the greatest possible benefit to the execution of this Contract.

Any dispute concerning the acceptance of a schedule or any other question of fact arising under this subsection shall be determined by the Engineer. Pending resolution of any dispute, the last schedule accepted by the Engineer will remain the Contract Schedule of Record.

**COMPENSATION****722.80 Method of Measurement and Basis of Payment (Types A, B, C and D)**

The Special Provisions will specify the fixed-price amount to be paid to the Contractor for the Project Schedule requirements contained herein. Each bidder shall include this lump-sum, fixed-price bid item amount in his/her bid. Failure to do so may be grounds for the rejection of the bid.

All required schedule-related work, including, but not limited to computers, computer software, the planning and coordination with utilities, training, schedule preparation and schedule submittals will be paid for under the fixed price amount.

This fixed price amount is for payment purposes only and is separate from what the Department considers to be the Contractor's General Condition costs. If the Contractor deems it necessary to include additional costs to provide all of the requirements of this section, these additional costs shall be included in the Contractor's overall bid price.

Twenty percent (20%) of this pay item will be paid upon the Engineer's acceptance of the Contractor's Baseline Schedule, prepared and submitted in accordance with Subsection 722.63.A.

The remaining eighty percent (80%) of this pay item will be paid in equal monthly installments distributed across the Contract Duration from Notice to Proceed (NTP) to Contractor Field Completion (CFC), less the 2 months required for the submittal and review of the Baseline Schedule in accordance with the following formula:

$$\text{Monthly Payment} = \frac{\text{Remaining Fixed Price amount (80\% of Item 100.)}}{\text{Contract Duration in whole months} - 2 \text{ months}}$$

The timely and accurate submission of the Baseline Schedule is critical to the Contract and the Department's ability to make informed decisions. Only payments under Item 740 - Engineer's Field Office and Item 748 - Mobilization will be made until the Baseline Schedule is accepted by the Engineer.

**SECTION 722 (Continued)**

No payment for any other pay item will be processed beyond seventy-five (75) Calendar Days from Notice to Proceed (NTP) until the Baseline Schedule is accepted by the Engineer. Until the Engineer's acceptance of the Baseline Schedule, the combined total of all payments made to the Contractor will be limited to an amount no greater than the total price for Item 748 - Mobilization or 3% of the contract price, whichever is less.

All Contract Progress Schedule Updates submitted later than ten (10) Calendar Days after the CQE (Contract Quantity Estimate) completion date, or greater than forty (40) Calendar Days from the Data Date of the previous submission, will be deemed to be no longer useful and will not qualify for payment. Late submittal of missed Contract Progress Monthly Updates will not result in recovery of the previously forfeited portion of the Schedule of Operations Fixed Price Payment Item.

Failure to submit schedules as and when required may result in the forfeiture of that portion of the Schedule of Operations Fixed Price Payment and/or the withholding of the full or partial CQE payments by the Engineer.

Failure to submit schedules that are acceptable to the Engineer may result in the forfeiture of that portion of the Schedule of Operations Fixed Price Payment and/or the withholding of the full or partial CQE payments by the Engineer.

The Schedule of Operations pay item will be adjusted to pay for only the actual quantity of schedules that have been submitted in accordance with this section.

The Contractor's failure or refusal to comply with the requirements of this Section shall be reasonable evidence that the Contractor is not prosecuting the Work with due diligence and may result in the withholding of full or partial payments by the Engineer.

Should there be a Time Extension granted to the Contractor, the Engineer may provide an Equitable Adjustment for additional Contract Progress Schedule Updates at intervals directed by the Engineer. Item 100. will be the basis for this Equitable Adjustment.

**722.82 Payment Items**

100. SCHEDULE OF OPERATIONS - FIXED PRICE \$ \_\_\_\_\_ LUMP SUM

**ITEM 100. EXCLUSION**

ITEM 100. is excluded from this project.

All costs associated with SECTION 722 are the responsibility of the Contractor and shall be considered incidental to the cost of the project, and no additional compensation will be allowed.

**ITEM 100.002****LABORER****HOOR**

Under this item the Contractor shall provide laborers, as directed and approved by the Engineer, to perform various tasks. The laborers will not be required to possess any special skills or licenses.

Typically, the Laborers will be working in conjunction with a two-man work crew providing cleaning and debris removal when and where the Engineer directs.

**METHOD OF MEASUREMENT**

Item 100.002 will be measured for payment per hour, for the actual hours worked.

**BASIS OF PAYMENT**

Item 100.002 will be paid for at the contract unit price per Hour, which price shall be full compensation for his work and use of tools. No compensation will be made for travel time to and from the job site.

**ITEM 109.1****BACKHOE/LOADER****HOOR**

Under this item, the Contractor shall furnish a backhoe and/or loader, and an operator.

Item 109.1 will be used at the discretion of the Engineer, for scheduled or non-scheduled (emergency) work, when said work is not suitable for compensation under other Items in this Contract.

The backhoe/loader shall be capable of providing excavation and trenching suitable for the installation of water pipe, hydrants, electrical duct banks, conduits and light pole bases to support light poles with a height of 65 feet.

Depending upon terrain conditions, equipment used shall be wheel type or track mounted, with 1.5 cubic yard front bucket, 3-foot maximum width backhoe dipper, and various size buckets including a trenching bucket or grading bucket. Acceptable equipment includes Caterpillar 450 Series, John Deere 710, Case 590, or similar.

**METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

Item 109.1 will be measured and paid for at the contract unit price per Hour. No compensation will be paid for travel time or trailer transportation of the backhoe/loader from the contractor business base location to the assigned location. Compensation will not be paid for travel time to and from each work site. But all costs in connection therewith shall be included in the contract unit price bid.

**ITEM 109.2**

**EXCAVATOR**

**HOUR**

This Item is to be used at the direction of the Engineer, for scheduled or non-scheduled (emergency) work, when said work is not suitable for compensation under other Items in this Contract.

The Excavator to be provided shall be of medium size, Caterpillar M314 Series, John Deere 190G W Series, rubber tire excavator, or similar approved by the Engineer. The excavator shall be in good condition and of such a size to perform the work required.

The purpose of this item is to compensate the Contractor for the furnishing of an excavator and operator.

**METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

Item 109.2 will be measured and paid for at the contract unit price per Hour. This cost shall include full compensation for all fuel, operation, operator, transportation and incidentals needed to complete the work as required by the Engineer.

**ITEM 109.4**

**DUMP TRUCK**

**HOUR**

This Item is to be used at the direction of the Engineer, for scheduled or non-scheduled (emergency) work, when said work is not suitable for compensation under other Items in this Contract.

The dump truck shall be late model vehicle in good condition. The vehicle body shall be in good condition and of such a size to perform the work required up to and including 70,000 lbs. G.V.W. and a heated body. The body shall be equipped with a minimum of three gated openings for dispensing material through the tail gate.

**METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

Item 109.4 will be measured and paid for at the contract unit price per Hour. This price will include full compensation for all fuel, transportation and all incidental costs required to complete the work.

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**ITEM 153.                    CONTROLLED DENSITY FILL – EXCAVATABLE                    CUBIC YARD**

The work under this item shall conform to the relevant provisions of Subsection 150 and the following:

Controlled density fill shall be furnished and placed for concrete roadway base repair and as directed by the Engineer.

Item 153. shall conform to the requirements of Subsection M4.08.0, Type 2E.

**METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

Item 153. will be measured and paid for at the contract unit price per Cubic Yard of material placed within the specified limits as directed the Engineer. This measurement excludes the volume of the pipe barrel or structure.

The Contract unit bid price per Cubic Yard shall be full compensation for all labor, tools, equipment, materials and all incidental costs required to complete the work.

**ITEM 376.11                    HYDRANT – INCLUDING THE COST HYDRANT                    EACH  
AND GATE VALVE**

The work under this Item shall conform to the relevant provisions of Section 300 of the standard specifications and the following:

The Contractor shall furnish, install and test, fire hydrant with gate valve and install appurtenant materials and equipment all in accordance with Boston Water and Sewer Commission (BWSC) Standard Details at locations as directed by the MassDOT Engineer.

Hydrant connections are to be restrained for the full length of the pipe from the main to the hydrant using methods as described in Section C3. Hydrants shall be set plumb on concrete slab as shown in the BWSC Standard Details. All hydrants shall be brush painted with color specified by the Engineer.

**METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

Item 376.11 will be measured and paid at the Contract unit price per Each, which price shall include full compensation for furnishing all labor, materials, tools, equipment necessary for removing, transporting, gate valve and thrust block as specified including testing, concrete slab, excavation, restrained joints, thrust block, crushed stone, backfilling, disposal of surplus material, and all incidental costs required to complete the work.

**ITEM 376.12**

**HYDRANT – REMOVED AND RESET  
HYDRANT AND GATE VALVE**

**EACH**

The work under this item shall conform to the relevant provisions of Section 300 of the standard specifications and the following:

The Contractor shall remove, reset and test, fire hydrant and gate valve. Install appurtenant materials and equipment all in accordance with BWSC Standard Details at locations as directed by the MassDOT Engineer. Contractor shall take all precautions to ensure that hydrant is protected during removal and stored at the work site or an appropriated location without any damage to the hydrant assembly until installation. Hydrant connections are to be restrained for the full length of the pipe from the main to the hydrant using methods as described in Section C3. Hydrants shall be set plumb on concrete slab as shown in the BWSC Standard Details. All hydrants shall be brush painted with color to be determined by MassDOT.

**METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

Item 376.12 will be measured and paid at the Contract unit price Each, which price shall be full compensation for furnishing all labor, materials, tools, and equipment necessary for supplying, transporting, installing and setting hydrant, gate valve and thrust block as specified including testing, concrete slab, excavation, restrained joints, thrust block, concrete slab, crushed stone, backfilling, disposal of surplus material, and all other incidental costs required to complete the work.



**ITEM 701.01****CEMENT CONCRETE SIDEWALK-  
REMOVE AND REPLACE****SQUARE YARD**

Work under this item shall conform to the relevant provisions of Subsection 701, of the Standard Specifications and the following:

If the sidewalk is to be open to pedestrian traffic during construction, sidewalk edges shall be beveled or ramped with asphalt mix which will be removed as construction is completed. This transition must comply with all ADA and AAB regulations and shall provide a smooth transition between adjacent surfaces. Vertical changes in grade greater than  $\frac{1}{4}$  inch shall not be allowed. Sketch plans shall follow a similar procedure as shop drawings in Subsection 5.02. Sketch plans will be submitted to the Engineer for approval.

All construction not in conformance with approved sketches, or performed without approved sketches, will be the responsibility of the contractor to correct. The Engineer will retain a copy of the approved sketches on file and permanently on file with the District's AAB/ADA Coordinator using the District's permanent electronic filing system upon completion of the project, so that in the event of a citation of violation by the AAB, compliance with the approved sketch can be determined.

The contractor and the engineer shall walk the locations identifying field conditions and problems before any sketches are prepared. A copy of the Contractor's field notes and all agreements to specific work requirements generated by this walk-thru that are not already covered by the maintenance contract shall be given to the Engineer for the project records.

**METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

Item 701.01 will be measured and paid for at the Contract unit price per Square Yard, which price shall include full compensation for furnishing all labor, materials, tools, equipment, crushed stone, backfilling, disposal of surplus material and all incidental costs required to complete the work.

The Contractor's unit bid price shall include the cost of saw cutting sidewalks and streets where directed; all excavation, removing and disposing of existing hot mix asphalt and cement concrete as directed by the Engineer.

The cost of this asphalt transition shall be incidental to this Item and shall be provided at no additional cost.

No separate payment will be made for sawcutting, excavation, removal and disposal of existing material. All costs in connection therewith shall be included in the contract unit price bid.

**ITEM 748.1****EMERGENCY RESPONSE****EACH**

Work under this item shall conform to the relevant provisions of Subsection 748 of the Standard Specifications, and the following:

This Item is intended to allow compensation to the Contractor for the costs associated with ensuring prompt response to emergency situations and to get equipment to a deemed emergency location.

It will be solely the Engineer that will determine and designate whether or not an assignment requires an emergency response and that this pay item will be eligible for inclusion.

This Item shall consist of preparatory work and operations for emergency response within a (4) four-hour period after notification from the Department. It shall include, but is not limited to, those preparations necessary for the movement of personnel, equipment, and incidentals to the project site for the establishment of an effective response under the work assignment.

**METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

Emergency Response will be measured per each notified incident the Contractor commences work within the four (4) hours of notification. In the event that another emergency occurs during the period that the Contractor's forces have been notified and are mobilizing or working, all additional responses performed by a different emergency response crew at a different work site during that period will be considered an additional emergency response in accordance with the requirements specified herein. Relocation of Scheduled Work Crews and equipment responding to an Emergency Response will NOT include separate compensation for Item 748.1 Emergency Response.

Item 748.1 Emergency Response will be paid at the contract unit bid price EACH and will constitute payment for the emergency response only. Payment under this item is to be made for at the contract unit bid price for each emergency response only. Payment for emergency response shall be in addition to that for any other items that may apply toward the completion of each emergency work order. All labor, material and equipment to perform the emergency work will be paid for under the appropriate pay items.

If the Contractor fails to respond within the allotted time frame, then a non-response penalty will be assessed in the amount specified under NON-RESPONSE PENALTIES for each assignment the Contractor fails to report.

In the event that the Contractor does not satisfy the four (4) hour response time, payment for Emergency Response will be made only at the discretion of the Engineer.

Payment for scheduled work will NOT include separate compensation for Item 748.1 Emergency Response.

**ITEM 853.8****TEMPORARY ILLUMINATION FOR WORK ZONE****DAY**

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

The work under this Item shall include the deployment and maintaining in proper operating condition a LED balloon diffuser lighting system. These portable light towers shall be used throughout the project area for temporary work zone lighting. The use of unshielded high wattage flood lights shall not be permitted.

These towers shall be used, relocated and adjusted to meet the criteria in Subsection 850 of the Standard Specifications and the following:

The Contractor shall illuminate the following work zone areas:

- Change in direction (i.e., work zone entrances and exits, crossovers, etc.)
- Tapered areas
- Actual area where the construction is being performed

Light measurement shall be based on the illuminance method and the lighting levels shall be based on the classification of construction activity that is taking place. At no time shall the light level be below 5 fc and the uniformity shall not exceed 6:1. Task Classifications and recommended illumination levels is shown in Table 1.

A detailed work zone lighting plan shall be submitted to MassDOT for approval before any work has commenced. Said plan shall include photometrics that detail the light levels that are to be provided. Photometrics shall include the following: calculated illuminance, uniformity, and glare avoidance verification throughout the work zone as well as the active travel lanes. The lighting plan shall be submitted with all supporting calculations, catalog cut sheets and supporting documentation.

Any potential glare from the lighting system should be considered from each direction and on all approaching roadways and opposing lanes of traffic. Glare from the illumination system should be minimized as much as possible for both workers and motorists in adjacent active travel lanes. If necessary, the Contractor shall provide supplemental hardware, such as, visors, louvers, shields, glare screen and barrier to reduce glare in adjacent active travel lanes.

The plan shall show the layout for each work area including the number, location, spacing of all fixed and/or mobile structures, description of illumination equipment that is proposed to be used on this project, and mounting details for mobile lights attached to construction equipment. Plan shall be designed by a professional engineer that is registered and licensed by the Commonwealth of Massachusetts and shall be submitted to the Engineer for approval prior to any nighttime work operations within the State Highway Right of Way.

The Contractor shall allow MassDOT up to 30 calendar days for review and comment.

**ITEM 853.8** (Continued)

**TABLE 1 TASK CLASSIFICATIONS AND ILLUMINATION LEVELS**

Task Classifications	Illumination Level	Average Minimum Maintained Illuminance
All work operations areas, setup of lane or road closures, lane closure tapers, and flagging stations, such as: Excavation (all types), Embankment Fill and Compaction, Reworking Shoulders, Asphalt Pavement Rolling, Subgrade, Stabilization and Construction, Base Course Rolling, Sweeping, Cleaning and Landscaping.	Level I	5 foot-candles
Areas on or around construction equipment; asphalt paving, milling, and concrete placement and/or removal, such as, Milling, Removal of Pavement, Asphalt Paving and Resurfacing, Concrete Pavement, Waterproofing and Sealing, Sidewalk Construction, Base Course Grading and Shaping, Surface Treatment, Bridge Decks, Drainage Structures and Drainage Piping, Other Concrete Structures, Barrier Wall and Traffic Separators, Guardrails and Fencing, Striping and Pavement Markings, Repair of Concrete Pavement, Highway Signs, Hole Filling and Repair of Guardrails and Fencing.	Level II	10 foot-candles
Pavement or structural crack/ pothole filling; joint repair, pavement patching and/or repairs, installation of signal/electrical/mechanical equipment, such as, Traffic Signals, Highway Lighting Systems and Crack Filling	Level III	20 foot-candles

**METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

Item 853.8 will be measured and paid for at the contract unit price per DAY. The cost shall include all labor, materials, equipment, tools and all incidentals required for the design and installation of the work zone lighting system. This shall include, but not be limited to lighting plan preparation, wiring connections, equipment relocations, and include all material and labor incidental for a complete, functional and operational work zone illumination system.

The price of this item shall include the material and labor necessary to install any supplemental hardware required to reduce glare on all adjacent active travel lanes. The per day price shall be full compensation for all “Temporary Illumination for Work Zone” regardless of the number of concurrent work areas, amount of equipment concurrently in use or the durations of or changes of the work shifts per day.

Installation and modifying the existing set-up shall be incidental to Item 853.8.

**ITEM 854.6****TEMPORARY PORTABLE RUMBLE STRIP****DAY**

Work under this item consists of furnishing, deploying, maintaining in proper operating conditions, and removing temporary portable rumble strips (TPRS) for temporary lane closures of 24 hours or less.

**MATERIALS**

The TPRS shall be 10' to 11' wide, measured perpendicular to the path of travel, 12" to 16" long, measured parallel to the path of travel, and 0.5" to 0.75" tall. All edges shall be beveled. The surfaces shall be grooved to limit potential hydroplaning.

The TPRS shall lay flat on the road surface without the use of nails, anchors, or adhesives, and shall be flexible so as to conform to the surface profile.

The TPRS shall be able to withstand vehicle weights of up to 80,000 lbs. and operate in temperatures between 0° to 120° F.

The manufacturer shall certify the TPRS to be safe for use on roads with speed limits of at least 70 mph.

TPRS that appear damaged or functioning in an unsafe manner may be order removed by the Engineer and replaced at no additional cost.

**CONSTRUCTION METHODS**

The TPRS shall be installed per the plans or at the discretion of the Engineer.

The Contractor shall conform to the manufacturer's specifications for installation and the following:

- A. The road surface shall be cleared of all gravel, sand, and debris.
- B. If RoadQuake 2<sup>TM</sup> model is used, the modular pieces shall be assembled into 11-foot strips per the manufacturer's instructions in advance of deployment. The interconnected segments shall form a smooth and flat, continuous section.
- C. A Truck-Mounted Attenuator, conforming to Subsection 850, shall be used as shadow vehicle protection during the deployment and removal of TPRS on any roadway with speeds of 45 mph or greater.
- D. TPRS shall be deployed in conjunction with all other temporary traffic control devices. MA-W28-1 (Rumble Strips Ahead) sign(s) shall be installed per the Temporary Traffic Control Plan.

**ITEM 854.6** (Continued)

E. TPRS deployment:

1. TPRS shall be placed perpendicular to the direction of travel, centered in the lane.
2. Three (3) individual strips are required for a single array.
3. Refer to the Temporary Traffic Control Plan for the location of the array respective to the lane closure.
4. The spacing of the individual strips within the array shall conform to the following table:

<b>Speed Limit</b>	<b>Distance Between Rumble Strips (measured center-to-center)</b>
>55 mph	20 feet
40 mph to 55 mph	15 feet
<40 mph	10 feet

5. The TPRS shall be placed without the use of nails, adhesives, or other methods of affixing them to the road surface.

F. All TPRS shall be maintained in proper condition, alignment, spacing, and location throughout the duration of the lane closure, at no additional cost.

G. The TPRS shall be removed prior to the removal of the traffic control devices used to close the travel lane.

H. TPRS shall not be used during snow events.

**METHOD OF MEASUREMENT**

An array of three (3) temporary portable rumble strips is considered one (1) unit and will be measured by the day. Each period of up to 24 hours during which this unit is in use will be measured as one day regardless of the number of times the array is deployed, repositioned, or removed.

**BASIS OF PAYMENT**

Temporary Portable Rumble Strip will be paid for at the contract unit price per day, which shall include full compensation for furnishing, deploying, repositioning, and removing the array of three (3) individual strips as directed by the Engineer.

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**ITEM 859.1**      **REFLECTORIZED DRUMS WITH SEQUENTIAL**      **DAY**  
**FLASHING WARNING LIGHTS**

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

Work under this item consists of furnishing, installing, maintaining in proper operating conditions, and removing reflectorized drums, and any necessary ballast, equipped with sequential flashing warning lights.

**MATERIALS**

Reflectorized drums shall be listed on the MassDOT Qualified Traffic Control Equipment List.

Reflective sheeting on drums shall meet or exceed ASTM D4956 Type VIII. All drums shall be maintained in a satisfactory manner including the removal of oils, dirt, and debris that may cause reduced retroreflectivity.

The Contractor shall use one of the following sequential flashing warning light systems unless otherwise approved by the Engineer:

1. Empco-Lite LWCS D.
2. pi-Lit® Sequential Barricade-Style Lamp; or
3. Unipart Dorman SynchroGUIDE.

Sequential flashing warning lights shall be secured to reflectorized drums per the light manufacturer's specifications.

**CONSTRUCTION METHODS**

The first ten (10) drums in any merging or shifting taper as designated in the Temporary Traffic Control Plan shall be equipped with sequential flashing warning lights. These lights shall be operating, at a minimum, between dusk and dawn when the taper is deployed.

The successive flashing of the sequential warning lights shall occur from the upstream end of the merging or shifting taper to the downstream end of the taper in order to identify the desired vehicle path. Each warning light in the sequence shall be flashed at a rate of not less than 55, nor more than 75 times per minute.

Warning lights shall be powered off when drums are not deployed in a taper.

**METHOD OF MEASUREMENT**

A group of ten (10) reflectorized drums with sequential flashing warning lights is considered one (1) unit and will be measured by the day. Each period of up to 24 hours during which this unit is in use will be measured as one day regardless of the number of times that the drums are positioned, repositioned, removed, or returned to service.

**ITEM 859.1** (Continued)

**BASIS OF PAYMENT**

Reflectorized Drums with Sequential Flashing Warning Lights will be paid for at the contract unit price per day, which shall include full compensation for furnishing, positioning, repositioning, and removing the group of ten (10) drums as directed by the Engineer.

**END OF DOCUMENT**

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