
COMMONWEALTH OF MASSACHUSETTS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS

for Highways and Bridges



2023 Edition

APPENDIX A



**APPENDIX A:
AMENDMENTS TO PREVIOUS VERSION**

NOTES

For reference only, the following changes have been approved by the Department and incorporated into the 2023 edition of the *Standard Specifications for Highways and Bridges*.

This Appendix is inclusive of the updates that were published as the *Supplemental Specifications*, dated September 30, 2022.

Any omissions below are unintentional. In any case(s) where there are differences between the *Standard Specifications* and the changes listed below, the *Standard Specifications* shall prevail.

MODIFICATIONS TO SPECIFIC SECTIONS

DIVISION I: GENERAL REQUIREMENTS AND COVENANTS

SECTION 1.00: DEFINITION OF TERMS

Subsection 1.03: Defined Terms

The following definitions have been added:

Roadway Flagger A person who actively controls the flow of vehicular, bicycle, and pedestrian traffic into and/or through a temporary traffic control zone as authorized in 701 CMR 7.00. Requirements for Roadway Flagger training, certification, apparel, and equipment are defined in Subsection 850: Traffic Controls for Construction and Maintenance Operations.

Special Provisions.. The special agreements and provisions prepared for proposed work on a specific project. The special provisions shall be included within the general term specifications and are part of the Contract.

Specifications The directions, provisions and requirements contained or referenced herein together with all written agreements made or to be made pertaining to the method and manner of performing the work, or the quantities and qualities of materials to be furnished under the Contract.

Standard

Specifications The Standard Specifications for Highways and Bridges issued by the Department.

Traffic Officer A uniformed law enforcement officer currently employed by a state, county, municipal or district law enforcement agency and is authorized to act as a law enforcement officer as defined in MGL Chapter 6E, Section 1.

The following definition has been modified:

Supplemental

Specifications Specifications issued by the Department which amend portions of the Standard Specifications.

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The following definition has been deleted:

**Interim
Supplemental**

Specifications Additions and revisions to the Standard Specifications or Supplemental Specifications issued by the Department which amend portions of the Standard or Supplemental Specifications in effect at the time the contract is awarded.

SECTION 4.00: SCOPE OF WORK

Subsection 4.04: Changed Conditions

The following paragraph has been added:

If the Contractor and the Department fail to agree on an equitable adjustment to be made under this Subsection, then the Contractor shall accept as full payment for the work in dispute an amount calculated using actual costs as provided in Subsection 9.03: Payment for Extra Work.

The following paragraphs have been deleted:

If the Contractor and the Department fail to agree on an equitable adjustment to be made under this Subsection, then the Contractor shall accept as full payment for the work in dispute an amount equal to the following:

- (1) The actual cost for direct labor, materials and use of equipment, plus 10 percent of this total for overhead.
- (2) Plus actual cost of Workmen's Compensation and Liability Insurance, Health, Welfare and Pension benefits, Social Security deductions, Employment Security Benefits and such additional fringe benefits which the Contractor is required to pay as a result of Union Labor Agreements and/or is required by authorized governmental agencies.
- (3) Plus 10 percent of the total of (1) and (2).
- (4) Plus the estimated proportionate cost of surety bonds.

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

For work performed by a Subcontractor, the Contractor shall accept as full payment therefor an amount equal to the actual cost to the Contractor of such work as determined by the Engineer plus 10% of such cost.

The Contractor shall, when requested by the Engineer, furnish itemized statements of the cost of the work ordered and give the Engineer access to all accounts, bills and vouchers relating thereto, and unless the Contractor shall furnish all such itemized statements, access to all accounts, bills and vouchers they shall not be entitled to payment for any items of extra work for which such information is sought by the Engineer.

The following paragraph has been added:

To assist the Engineer in the determination of an equitable adjustment for an overrun, the Contractor shall prepare a submission and accept as full payment for work or materials an amount

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for an equitable adjustment in the Contract Price calculated using actual costs as provided in Subsection 9.03: Payment for Extra Work.

The following paragraphs have been deleted:

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

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

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

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

SECTION 5.00: CONTROL OF WORK

Subsection 5.03: Conformity with Plans and Specifications

The following paragraphs have been added:

In the event the Engineer finds the materials or the finished product in which the materials are used or the work performed are not in reasonably close conformity with the plans and specifications and have resulted in an inferior or unsatisfactory product, the work or materials shall be removed and replaced or otherwise corrected by and at the expense of the Contractor.

Materials or work that are found not to conform must not be made inaccessible prior to the resolution of the deficiencies.

Deviations from the approved plans and working drawings, that may be required by the need of construction, will be determined by the Engineer and authorized in writing.

The following paragraphs have been deleted:

In the event the Engineer finds the materials or the finished product in which the materials are used or the work performed are not in reasonably close conformity with the plans and specifications and have resulted in an inferior or unsatisfactory product, the work or materials shall be removed and replaced or otherwise corrected by and at the expense of the Contractor.

Deviations from the approved plans and working drawings, that may be required by the need of the construction, will be determined by the Engineer and authorized by them in writing.

Subsection 5.04: Order of Precedence

Interim Supplemental Specifications has been removed from the Order of Precedence.

SECTION 7.00: LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC

Subsection 7.01: Laws to be Observed

The following paragraphs have been deleted:

H. Cargo Preference Act – Use of United States-Flag Vessels.

On Federally-aid projects the work shall comply with the Cargo Preference Act of 1954 and implementing regulations (46 CFR Part 381).

The contractor agrees:

- (1) To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels.
- (2) To furnish within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, 'on-board' commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (1) of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590.
- (3) To insert the substance of the provisions of this clause in all subcontracts issued pursuant to this contract.

Subsection 7.03: Permits and Licenses

The following paragraph has been added:

For overweight vehicles in excess of 130,000 lb, the Contractor shall provide a copy of each overweight vehicle permit to the Engineer prior to arrival or delivery of the vehicle to a project site. This requirement is for all Contractors, their subcontractors, equipment suppliers and material suppliers.

SECTION 8.00: PROSECUTION AND PROGRESS

Subsection 8.05: Claim for Delay or Suspension of the Work

The following paragraph has been added:

Provided, however, that if in the judgement of the Engineer it is determined that the performance of all or any major portion of the work is suspended, delayed, or interrupted for an unreasonable period of time by an act of the Department in the administration of the Contract, or by the Department's failure to act as required by the Contract within the time specified in the Contract (or if no time is specified, within a reasonable time) and without the fault or negligence of the

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Contractor, an adjustment shall be made by the Department for any increase in the actual cost of performance of the Contract (excluding profit and overhead) necessarily caused by the period of such suspension, delay or interruption. No adjustment shall be made if the performance by the Contractor would have been prevented by other causes even if the work had not been so suspended, delayed, or interrupted by the department.

The following paragraph has been deleted:

Provided, however, that if the Commission in their judgment shall determine that the performance of all or any major portion of the work is suspended, delayed, or interrupted for an unreasonable period of time by an act of the Department in the administration of the Contract, or by the Department's failure to act as required by the Contract within the time specified in the Contract (or if no time is specified, within a reasonable time) and without the fault or negligence of the Contractor, an adjustment shall be made by the Department for any increase in the actual cost of performance of the Contract (excluding profit and overhead) necessarily caused by the period of such suspension, delay or interruption. No adjustment shall be made if the performance by the Contractor would have been prevented by other causes even if the work had not been so suspended, delayed, or interrupted by the department.

The following paragraph has been added:

Any dispute concerning whether the delay or suspension is unreasonable or any other question of fact arising under this paragraph shall be determined by the Engineer, and such determination and decision, in case any question shall arise, shall be a condition precedent to the right of the Contractor to receive any money hereunder.

The following paragraph has been deleted:

Any dispute concerning whether the delay or suspension is unreasonable or any other question of fact arising under this paragraph shall be determined by the Commission, and such determination and decision, in case any question shall arise, shall be a condition precedent to the right of the Contractor to receive any money hereunder.

Subsection 8.07: Character of Workers, Methods and Equipment

The following paragraph has been added:

All electrical connections, splicing, grounding, resistance tests, service connections and circuit identification shall be done by a licensed electrician holding a Massachusetts journeyman electrician's license. The Contractor shall provide to the Engineer at least 10 days prior to each work assignment the names and license qualifications of electricians.

Subsection 8.13: Convenience Termination

The following paragraph has been added to Part B: For Construction Related Costs:

Actual costs as provided in Subsection 9.03: Payment for Extra Work.

The following paragraphs have been deleted from Part B: For Construction Related Costs:

- (1) The actual costs for direct labor (direct labor costs shall include the actual salary costs of laborers, equipment operators, truck drivers, steel workers and other trades persons

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- up to and including working foremen. The costs of general superintendence shall be considered included in field and/or home office overhead.), materials (less salvage value, if any) and use of equipment (determined in accordance with Subsection 9.03 of the Standard Specifications), plus 10% of this total for overhead (the 10% additive is inclusive of both field and home office overhead); and
- (2) The actual cost for Salary Related Costs such as Worker's Compensation and Liability Insurance, Health, Welfare and Pension benefits, Social Security deductions, and Employment Security Benefits; and
 - (3) 10% of the total of (1) and (2) for profit; and
 - (4) The estimated proportionate cost of surety bonds; and
 - (5) The actual cost to the Contractor for work performed by a subcontractor, plus 10% of such cost.

No allowance shall be made for general superintendence and the use of small tools and manual equipment. General superintendence is that next level above the working foreman. The costs of general superintendence as well as use of small tools and manual equipment shall be considered included in field and/or home office overhead.

SECTION 9.00: MEASUREMENT AND PAYMENT

Subsection 9.03: Payment for Extra Work

The following paragraphs have been added to Part B: Payment for work or materials for which no price is contained in the Contract:

If the Engineer directs, the Contractor shall submit promptly in writing to the Engineer an offer to do the required work on a lump sum or unit price basis, as specified by the Engineer. The stated price, either lump sum or unit price, shall be divided so as to show that it is the sum of:

- (1) The estimated cost of direct labor, materials, and the use of equipment, plus 10 percent of this total for overhead;
- (2) Plus 13 percent of direct labor, for the actual costs of Federal Insurance Contribution Act (FICA), Federal Unemployment Tax Act (FUTA), State Unemployment Tax Act (SUTA) including workforce training and Massachusetts Employer Medical Assistance Contribution, Earned Sick Time (EST) Law (940 CMR 33.00), and Paid Family and Medical Leave (PFML) Act (458 CMR 2.00); or, as an alternative to the above 13 percent, the Contractor may elect to use actual rates for FICA, FUTA, SUTA, EST and PFML provided the actual rates are supported with verifiable documentation and shall be subject to review by Audit Operations;
- (3) Plus the actual cost of Workmen's Compensation and Liability Insurance, Health, Welfare and Pension benefits, and such additional fringe benefits which the Contractor is required to pay as a result of Union Labor Agreements and/or is required by authorized governmental agencies;
- (4) Plus subcontractor or a Public or Private Utility costs;
- (5) Plus 10 percent of the total of (1), (2), (3) and (4);
- (6) Plus the estimated proportionate cost of surety bonds (The Contractor shall provide evidence of revised bonds according to Subsection 3.04).

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Unless an agreed lump sum and/or unit price is obtained from above and is so stated in the Extra Work Order the Contractor shall accept as full payment for work or materials for which no price agreement is contained in the Contract an amount equal to the following:

- (1) The actual cost for direct labor, material (less value of salvage, if any) and use of equipment, plus 10 percent of this total for overhead;
- (2) Plus 13 percent of direct labor, for the actual costs of Federal Insurance Contribution Act (FICA), Federal Unemployment Tax Act (FUTA), State Unemployment Tax Act (SUTA), including workforce training and Massachusetts Employer Medical Assistance Contribution, Earned Sick Time (EST) Law (940 CMR 33.00), and Paid Family and Medical Leave (PFML) Act (458 CMR 2.00); or, as an alternative to the above 13 percent, the Contractor may elect to use actual rates for FICA, FUTA, SUTA, EST and PFML provided the actual rates are supported with verifiable documentation and shall be subject to review by Audit Operations;
- (3) Plus the actual cost of Workmen's Compensation and Liability Insurance, Health, Welfare and Pension benefits, and such additional fringe benefits which the Contractor is required to pay as a result of Union Labor Agreements and/or is required by authorized governmental agencies;
- (4) Plus subcontractor or a Public or Private Utility costs;
- (5) Plus 10 percent of the total of (1), (2), (3) and (4);
- (6) Plus the estimated proportionate cost of surety bonds (The Contractor shall provide evidence of revised bonds according to Subsection 3.04).

Costs incurred for traffic police, railroad flagging and permits will be reimbursed without markup for overhead or profit.

The Subcontractor is bound by the same criteria for the determination of an equitable adjustment as the Contractor.

No separate payment will be made for general superintendence and the use of small tools, and manual equipment. The costs of general superintendence as well as use of small tools and manual equipment will be considered included in field and/or home office overhead. General superintendence is that next level above the working foreman.

The Contractor shall, when requested by the Engineer, furnish itemized statements of the cost of the work ordered and give the Engineer access to all accounts, bills and vouchers relating thereto, and unless the Contractor shall furnish such itemized statements, access to all accounts, bills and vouchers, the Contractor shall not be entitled to payment for any items of extra work for which such information is sought by the Engineer.

The following paragraphs have been deleted from Part B: Payment for work or materials for which no price is contained in the Contract:

If the Engineer directs, the Contractor shall submit promptly in writing to the Engineer an offer to do the required work on a lump sum or unit price basis, as specified by the Engineer. The stated price, either lump sum or unit price, shall be divided so as to show that it is the sum of:

- (1) The estimated cost of direct labor, materials, and the use of equipment, plus 10 percent of this total for overhead;

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- (2) Plus the actual cost of Worker's Compensation and Liability Insurance, Health, Welfare and Pension benefits, Social Security deductions, Employment Security Benefits, and such additional fringe benefits which the Contractor is required to pay as a result of Union Labor Agreements and/or is required by authorized governmental agencies;
- (3) Plus subcontractor or a Public or Private Utility costs;
- (4) Plus 10 percent of the total of (1), (2) and (3);
- (5) Plus the estimated proportionate cost of surety bonds.

Unless an agreed lump sum and/or unit price is obtained from above and is so stated in the Extra Work Order the Contractor shall accept as full payment for work or materials for which no price agreement is contained in the Contract an amount equal to the following:

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

Costs incurred for traffic police, railroad flagging and permits will be reimbursed without markup for overhead or profit.

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

The Contractor shall, when requested by the Engineer, furnish itemized statements of the cost of the work ordered and give the Engineer access to all accounts, bills and vouchers relating thereto, and unless the Contractor shall furnish such itemized statements, access to all accounts, bills and vouchers, the Contractor shall not be entitled to payment for any items of extra work for which such information is sought by the Engineer.

DIVISION II: CONSTRUCTION DETAILS

SUBSECTION 230: CULVERTS, STORM DRAINS, AND SEWER PIPES

230.20: General

This construction specification has been replaced in its entirety.

230.62: Pipe Joints

The following paragraphs have been added:

The joints of concrete pipe shall be formed by caulking a gasket of jute or oakum into the bell and then filling the remainder of the joint with cement mortar. The invert shall be kept smooth and free of any obstructions. In the case of concrete pipe, the surfaces to be joined shall be thoroughly cleaned and wetted with water before the joint is made. Corrugated metal pipe and corrugated plastic pipe shall be firmly joined with an approved coupling. The interior surfaces of abutting pipes shall form a smooth grade when pipe laying is completed.

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Where watertight joints are required, concrete pipe shall be joined using flexible watertight rubber gaskets conforming to M5.01.0. The pipe ends shall be designed so that the gasket will be confined on all sides and will not support the weight of the pipe. Any alternative joint design must be pre-approved by the Engineer.

In designated areas, as directed, certain joints may be left open to allow for entrance of underground water into the pipeline.

The following paragraphs have been deleted:

The joints of concrete pipe shall be formed by caulking a gasket of jute or oakum into the bell and then filling the remainder of the joint with cement mortar. The invert shall be kept smooth and free of any obstructions. In the case of concrete pipe the surfaces to be joined shall be thoroughly cleaned and wetted with water before the joint is made. Corrugated metal pipe and corrugated plastic pipe shall be firmly joined with an approved coupling.

When rubber type ring gaskets are used the pipe ends shall be designed so that the gasket will be confined on all sides and will not support the weight of the pipe. Regardless of the type of joint used the interior surfaces of abutting pipes shall form a smooth grade when pipe laying is completed.

Where water tight joints are required, concrete pipe shall be joined using flexible water tight rubber gaskets conforming to ASTM C443. Any alternative joint design must be pre-approved by the Engineer.

In designated areas, as directed, certain joints may be left open to allow for entrance of underground water into the pipe line.

230.82: Payment Items

The following Payment Item has been added:

*241.- -Inch Reinforced Concrete Pipe Class III Foot

The following Payment Items have been deleted:

*241.- -Inch Reinforced Concrete Pipe Foot
to *245.-

*241.-1 -Inch Reinforced Concrete Pipe Flared End Each
to *245.-1

SUBSECTION 301: WATER SYSTEMS

301.40: General

The following material requirements have been added:

Joining Materials for Pipes M5.01.0

The following material requirements have been deleted:

Joining Materials for Pipes M9.10.0

The following paragraph has been deleted:

Valve boxes, service boxes, corporation cocks, air relief valves, yokes and tie-rods, curb stops, plugs and any other materials which are required shall be the type used by the particular municipality involved or as specified in the Special Provisions. Air relief valves shall be installed at the high points of the main or where and as directed.

SUBSECTION 813: WIRING, GROUNDING AND SERVICE CONNECTIONS

This Subsection has been replaced in its entirety.

SUBSECTION 815: TRAFFIC CONTROL SIGNALS

815.20: General

The following paragraph has been added:

All work within the traffic control cabinet shall be done by an IMSA Certified Traffic Signal Level II Technician. The Contractor shall provide to the Engineer names and certification qualifications of all persons who will be working within the traffic control cabinet at least 10 days prior to the start of any traffic control cabinet work.

The following paragraph has been deleted:

All electrical connections, splicing, grounding, resistance tests, service connections and circuit identification shall be done by a licensed electrician holding “Certificate B” issued by the State Examiners of Electricians. All work within the traffic control cabinet shall be done by an IMSA Certified Traffic Signal Field Technician Level II.

SUBSECTION 820: HIGHWAY LIGHTING

820.20: General

The following paragraph has been deleted:

All electrical connections, splicing, grounding, resistance tests, service connections and circuit identification shall be done by a licensed electrician holding “Certificate B” issued by the State Examiners of Electricians.

SUBSECTION 840: SIGN SUPPORTS

840.20: General

The following dampening devices have been removed:

- Existing structures which do not have damping devices shall have dampers installed as part of the Contract.
- Existing structures, which have dampers not attached as specified above, shall have them removed and attached as specified above.

The following paragraphs have been added:

Before fabricating the sign support structures, the Contractor shall submit erection plans and shop drawings for approval of the Engineer.

Shop drawings shall be in accordance with 960.60: Shop Drawings and Subsection 5.02: Plans and Detail Drawings and include span lengths, post heights, vertical and horizontal clearances, material specifications (grade and/or alloy), anchor bolt layout, and any other pertinent information. Provisions for cambering shall also be shown to ensure that horizontal cross beams will not deflect below the horizontal.

Erection procedures shall be in accordance with 960.61 Design, Fabrication and Erection.

The following paragraph has been deleted:

Before fabricating the sign support structures, the Contractor shall submit erection plans and shop drawings for approval of the Engineer in accordance with Subsection 5.02: Plans and Detail Drawings, 828.21: Plans and 960.60: Shop Drawings. Span lengths, post heights, vertical and horizontal clearances, material specifications (grade and/or alloy), anchor bolt layout, and all pertinent information shall be included on the shop drawings. Provisions for cambering shall also be shown to ensure that horizontal cross beams will not deflect below the horizontal.

840.40: Method of Measurement

The following paragraphs have been added:

Payment items in the 841.* series, and payment items 845.1* through 848.1* will be measured by each.

Payment Items 840.1* and 844.1* will be measured by lump sum.

The following paragraphs have been deleted:

The foundation, excavation, backfilling and compaction for foundations and the structural supports shall be considered as one lump sum unit.

Breakaway P-5 Post Assembly, single or double, complete in place, shall be considered as one unit.

840.41: Basis of Payment

The following paragraphs have been added:

Payment items in the 840.* through 848.* series will be paid for at the contract unit price, which price shall be full compensation for design and construction of the completed structure including all excavation, gravel backfill and compaction. Rock excavation when encountered shall be paid under Class B Rock Excavation.

Breakaway P-5 Post Assembly, single or double, shall be considered as one unit.

The following paragraphs have been deleted:

Payment items in the 841. payment item series, and payment items 845.1 through 848.1 shall be paid at the contract unit price for each sign installed. Payment for work done under payment items 840.1* and item 844.1* shall be at the contract lump sum price.

The contract price shall be full compensation for designing, furnishing and erecting the supports, including construction of the concrete bases, steel reinforcement and anchor bolts; furnishing and installing post assembly and all excavation, gravel backfill and compaction except rock excavation, which shall be paid under Class B Rock Excavation.

SUBSECTION 850: TRAFFIC CONTROLS FOR CONSTRUCTION AND MAINTENANCE OPERATIONS

850.29: Temporary Barrier and Temporary Barrier Removed and Reset

The following paragraph has been added:

Temporary Barrier consists of furnishing, installing, maintaining and final removal of temporary barriers, including delineation, for traffic control or work zone protection in construction zones.

The following paragraph has been deleted:

Temporary Barrier consists of furnishing, installing, maintaining and final removal of temporary barriers, including delineation, for traffic control or work zone protection in construction zones. This barrier shall be continuous as a unit across bridges and other limited construction areas unless designated on the plans as “Temporary Restrained Barrier.”

850.30: Temporary Restrained Barrier and Temporary Restrained Barrier Removed and Reset

This construction specification has been deleted.

850.50: Temporary Restrained Barrier

This construction specification has been deleted.

850.70: Temporary Restrained Barrier and Temporary Restrained Barrier Removed and Reset

This construction specification has been deleted.

850.80: Method of Measurement

The following paragraph has been deleted:

Temporary Restrained Barrier and Temporary Restrained Barrier Removed and Reset will be measured by the foot in place.

850.81: Basis of Payment

The following paragraphs have been deleted:

Temporary Restrained Barriers as shown on the plans will be paid for at the contract unit price per foot which shall provide full compensation for furnishing, initial installation, planing operations, delineation, testing, maintaining the temporary barrier and delineation, final removal and transportation of the temporary barriers, restoration of the planed surfaces or pin holes, and shall include all hardware, materials, equipment, and labor necessary to restrain the barriers.

The Contractor shall have no claim for extra compensation for any variations in the system due to diameter of the bolt hole, the embedment length, the method of producing the hole, repairing the hole or the type of adhesive used in anchoring the proposed barriers.

Temporary Restrained Barriers Removed and Reset will be paid for at the contract unit price per foot which shall provide full compensation for removing, relocating, re-setting, testing, re-aligning, maintaining the temporary barrier and delineation, and transportation of the temporary barrier including delineation, restoration of the planed surfaces or pin holes, and shall include all hardware, materials, equipment, and labor necessary to restrain the barriers. The Contractor shall have no claim for extra compensation for any variations in the system due to diameter of the bolt hole, the embedment length, the method of producing the hole, repairing the hole or the type of adhesive used in anchoring the proposed barriers. The Contractor shall be paid Remove and Reset each time the barrier is relocated either to a new work zone, to off-season storage, or back to the project from storage.

SUBSECTION 860: REFLECTORIZED PAVEMENT MARKINGS

860.40: General

The following material requirements have been added:

Liquid Thermoplastic Striping Material.....M7.01.3

The following material requirements have been deleted:

White Thermoplastic ReflectORIZED Pavement MarkingsM7.01.03

Yellow Thermoplastic ReflectORIZED Pavement Markings..... M7.01.04

860.62: Application of Markings

Table 860.62-1 has been updated to remove references to material specification M7.01.4.

SUBSECTION 965: MEMBRANE WATERPROOFING FOR NEW BRIDGE DECKS

965.40: Submittals

The following item has been added to the Contractor submittal requirements for Part 2: At the pre-application meeting:

- The QC Plan in accordance with Subsection 965: Membrane Waterproofing for New Bridge Decks.

The following item has been deleted from the Contractor submittal requirements for Part 2: At the pre-application meeting:

- List of personnel performing the installation, inspection, and testing.

965.46: Application

The following sentence has been deleted from the third paragraph:

A longer period will be allowed only with prior written approval from the Engineer.

965.64: Quality Control Sampling and Testing Requirements

The following paragraph has been deleted:

The Contractor shall take a representative sample of the membrane from that day's installation. The samples shall consist of two 10-in. by 10-in. square samples of the membrane with smooth surfaces. The primer and aggregate shall not be incorporated into the sample. The sample shall be sprayed separate from the bridge deck on a non-adhesive surface using the same application techniques used for the deck. These samples shall be peeled off the non-adhesive surface and be provided to the Engineer to be tested by the Department.

The following paragraph has been added:

The Contractor shall take a representative sample of the membrane from that day's installation. The samples shall consist of two 10-in. by 10-in. square samples of the membrane with smooth surfaces. The primer and aggregate shall not be incorporated into the sample. The sample shall be sprayed on a non-adhesive surface using the same application techniques used for the deck. The sample shall be removed from the non-adhesive surface by the Contractor in a manner that does not damage the sample and that sample shall be delivered to the Engineer for Department testing.

In Table 965.64-1, the Engineering Limits for Film Thickness has been changed from "≥ 80 mils minimum measured over peaks; or ≥ Thickness used to pass ASTM C1305 (whichever thickness is greater)" to "Thickness used to pass ASTM C1305."

965.72: Acceptance Sampling and Testing Requirements

In Table 965.72-1, the Engineering Limits for Minimum Thickness (Membrane only) has been changed from "≥ 80 mils minimum measured over peaks; or ≥ Thickness used to pass ASTM C1305 (whichever thickness is greater)" to "Thickness used to pass ASTM C1305."

DIVISION III: MATERIALS SPECIFICATIONS

SECTION M3: ASPHALTIC MATERIALS

M3.01.6: Asphalt Release Agents

The following paragraph has been added:

Asphalt release agents shall be evaluated by NTPEP in accordance with AASHTO T 383.

The following paragraphs have been deleted:

Asphalt release agents shall be evaluated by NTPEP. Release agents shall meet the following minimum requirements:

1. 7-Day Stripping Test - No stripping or discoloration when used in full strength and diluted forms.
2. Mixture Slide Test - 10.0 grams retained, maximum.
3. Asphalt Performance Test - Able to pull the cooled binder from the metal plate without adherence, a minimum of three pours.
4. Flash Point, ASTM D93 - Have a flash point greater than 400°F on the undiluted product and contain no flammable materials, solvents, or petroleum elements.

M3.06.2: Aggregate for Hot Mix Asphalt

The following paragraphs have been added to Part E: Recycled Asphalt Pavement:

The RAP shall be stockpiled on a free draining base and kept separate from the other aggregates. RAP stockpiles shall be covered by a framed structure which prevents the intrusion of water but also allows the flow of air to promote drying of the stockpile. The structure shall be capable of storing a minimum of 500 tons of RAP. The RAP stockpiles shall have a reasonably uniform gradation from fine to coarse and shall not be contaminated by foreign materials. The RAP used in the HMA mix production shall have a moisture content such that the final HMA contains no more than 0.5% moisture.

The proportion of RAP to virgin aggregate shall be in accordance with Table M3.06.2-4 and M3.01.3: Asphalt Binder Grade for Recycled Asphalt Materials.

The following paragraphs have been deleted from Part E: Recycled Asphalt Pavement:

The RAP shall be stockpiled on a free draining base and kept separate from the other aggregates. RAP stockpiles shall be covered in a manner that prevents the intrusion of water but also allows the flow of air. The RAP stockpiles shall have a reasonably uniform gradation from fine to coarse and shall not be contaminated by foreign materials. The RAP used in the HMA mix production shall have a moisture content such that the final HMA contains no more than 0.5% moisture.

The use of RAP will be permitted at the option of the Contractor and provided that the end product is in conformance with the approved JMF. The proportion of RAP to virgin aggregate shall be in accordance with Table M3.06.2-4 and M3.01.3: Asphalt Binder Grade for Recycled Asphalt Materials.

SECTION M4: CEMENT AND CEMENT CONCRETE MATERIALS

M4.02.00: Cement Concrete

The row for “% Entrained Air ($\pm 1.5\%$) has been removed from Table M4.02.00-1.

The following paragraphs have been deleted:

All concrete shall contain a water reducing admixture.

Concrete which will be subjected to conditions of severe exposure will be 4,000 psi with air-entrained content of $7.0\% \pm 1.5\%$ when so specified. Concrete that is used to construct drilled shafts shall have an entrained air content of $4.0\% \pm 1.5\%$.

The use of an approved additive other than air entraining (AASHTO M 154M/M 154) or water reducer (AASHTO M 194M/M 194, Type A) shall require written approval of the Engineer and additives shall not affect a change in the minimum cement content. The minimum cement content can be changed only with the prior written approval of the Engineer.

M4.02.02: Aggregates

This material specification has been replaced in its entirety.

M4.02.05: Chemical Admixtures

This material specification has been renamed from “Cement Concrete Additives” and replaced in its entirety.

M4.02.06: Proportioning

The following paragraphs have been added to Part B.2: Scope of Control for Proportioning, Consistency:

The Contractor shall uniformly regulate the consistency of the mix to the slump directed by the Engineer. The slump target shall be identified on the approved cement concrete mix design sheet. For approved slump targets less than or equal to 3 in., slump test results shall not exceed the allowable tolerance of ± 1.0 in. from the approved target. For approved slump targets greater than 3 in., slump test results shall not exceed the allowable tolerance of ± 1.5 in. from the approved target.

Modifications to the approved slump target shall be prohibited. If slump test results are not within the specified design target ranges, the Contractor is permitted to request for Department review and approval, on-site adjustments of chemical admixture dosages and the use of water held back at the plant. The Engineer may reject non-conforming batches and the Contractor shall receive no additional compensation.

The following paragraphs have been deleted from Part B.2: Scope of Control for Proportioning, Consistency:

The Contractor shall uniformly regulate the consistency of the mix to the slump directed by the Engineer. The Engineer may reject all batches not conforming to this requirement and the Contractor shall receive no additional compensation.

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The general requirements in regard to consistency are as follows:

Mass Concrete	2 ± ½ in. slump
Exposed Bridge Deck Concrete	2.5 ± ½ in. slump
Reinforced Concrete	3 ± 1 in. slump
Very Constricted Placement Conditions	4 ± 1 in. slump
Pump Concrete	4 ± 1 in. slump
Tremie Concrete.....	6 ± 1 in. slump
Drilled Shaft Concrete (Permanent Casing or Dry Uncased Placement).....	5 ± 1 in. slump
Drilled Shaft Concrete (Dry Temporary Casing Placement).....	7 ± 1 in. slump
Drilled Shaft Concrete (Tremie or Slurry Placement)	8 ± 1 in. slump

When the specified slump is 3 in. or less, the tolerance shall be ± ½ in. When the specified slump is greater than 3 in., the tolerance shall be ± 1 in. The Engineer will specify the lowest slump with which it is practicable to properly place and consolidate the mix within the forms.

The following paragraph and Table have been added to Part B.4: Scope of Control for Proportioning, Air Content:

The air void system shall contain a stabilized air bubble distribution and promote quality concrete properties, including enhanced workability, cohesion, strength, and resistance to freezing, thawing, de-icing, and sulfate reaction. Cement concrete shall meet the air content targets identified in Table M4.02.06-1. A tolerance of ±1.5% in the percentages will be allowed.

Table M4.02.06-1: Air Content Target

Nominal Maximum Aggregate Size (in.)	Reinforced Concrete (%) ^[1]	Non- Reinforced Concrete (%) ^[1]
¾	7.5	7.5
½	7.0	7.0
¾	6.0	7.0
1	6.0	6.5
1½	5.5	6.5

^[1]A 1.0% reduction from the air content target is permitted for $f'_c \geq 5000$ psi.

The following paragraph has been deleted from Part B.4: Scope of Control for Proportioning, Air Content:

The air content of the concrete by volume shall be as shown in the table above when tested in accordance with AASHTO T 152. A tolerance of ±1.5% in the above percentages will be allowed.

SECTION M5: PIPE, CULVERT SECTIONS AND CONDUIT

M5.01.0: Joint Materials for Pipe

This material specification has been added.

M5.01.1: Reinforced Concrete Pipe

The following paragraphs have been added:

Reinforced concrete pipe shall conform to the requirements of AASHTO M 170 for the class of pipe specified in the contract documents.

- All pipe 24 in. in diameter or smaller shall be of the bell-and-spigot type.
- Pipes larger than 24 in. in diameter shall be tongue and groove or bell and spigot.

The following paragraph has been deleted:

Reinforced concrete pipe shall conform to the requirements of AASHTO M 170 for Standard Strength Reinforced Concrete Culvert Pipe for Class III Pipe, except that the steel area for 24-in. pipe shall be 0.10 in.² per ft and circular reinforcement only shall be used in circular pipes. All pipe 24 in. in diameter or smaller shall be of the bell-and-spigot type. Pipes larger than 24 in. in diameter shall be tongue and groove or bell and spigot.

M5.01.2: Reinforced Concrete Pipe Flared Ends

The following paragraph has been added:

Flared end sections shall be fabricated to comply with the current construction standard for this item. The method of fabrication and materials used shall conform to the requirements of AASHTO M 170, Class III, except that the three edge bearing tests shall not be required. The flare shall be of the same thickness and materials as the barrel and have steel reinforcement equaling or exceeding the amount shown on the table for AASHTO M 170, Class III, except that a double row of steel will not be required.

The following paragraph has been deleted:

Flared End Sections shall be fabricated to comply with the current construction standard for this item. The method of fabrication and materials used shall conform to the requirements of AASHTO M 170, Class III, except that the three edge bearing tests shall not be required. The flare shall be of the same thickness and materials as the barrel and have steel reinforcement equaling or exceeding the amount shown on the table for AASHTO M 170, Class III, except that a double row of steel will not be required.

SECTION M7: PAINTS, PROTECTIVE COATINGS AND PAVEMENT MARKINGS

M7.00.0: General Requirements for Paints and Protective Coatings

“M7.01: Pavement Markings” has been removed from Part B.2: Sampling and Testing, Testing.

M7.01.0: Pavement Markings

This material specification has been renumbered from M7.01.

M7.01.03: White Thermoplastic Reflectorized Pavement Markings and M7.01.04: Yellow Thermoplastic Reflectorized Pavement Markings have been removed from the list.

M7.01.3 Liquid Thermoplastic Striping Material

This material specification has been added.

SECTION M8: METALS AND RELATED MATERIALS

M8.01.5: Anchor Bolts, Nuts and Washers

This material specification has been replaced in its entirety.

M8.01.9: Mechanical Reinforcing Bar Splicer

In Table M8.01.9-1, the Requirement for the Ultimate Tensile Strength of Mechanical Splicer System has changed from “90% of ultimate tensile strength of reinforcement bars (80,000 psi minimum for AASHTO M 31 Grade 60). During testing, the ultimate failure of the spliced reinforcing bar system shall occur either in the reinforcing bar being joined or in the splicing device at a minimum of 150% of the yield strength of the reinforcing bar,” to “100% of ultimate tensile strength of reinforcement bars per AASHTO M31.”

M8.16.0: Electrical Wire & Cable

The following paragraph has been added:

This specification covers all electrical wire and cable for traffic control devices, traffic signals, ITS systems, highway lighting, signs and supports. All wire and cable herein are for copper conductors rated for 600V. All traffic signal cable conductors shall not be less than #14 AWG, with an exception for individual conductor drops between a span wire hub and the signal head, which shall be not less than #16 AWG. All traffic signal conductors shall be stranded.

The following paragraph has been deleted:

This specification covers all electrical wire and cable for traffic control devices, signals, highway lighting, signs and supports. All wire and cable herein are for copper conductors rated for 600V, all traffic signal cable conductors shall not be less than No. 14 AWG, solid or stranded and all conductors for mast arm wiring shall be not less than No. 16 AWG stranded.

M8.16.3: Type 3 Traffic Signal Cable (Installed above ground)

This material specification has been renamed.

M8.16.6: Type 6 Traffic Signal Wire (TFF or TEW)

This material specification has been deleted.

M8.16.7: Type 7 General Purpose Wire (XHHW-2 with XLP Jacket)

This material specification has been renamed.

The following sentence has been added:

Type 7 Wire installed in a tunnel shall have a VW-1 Rating.

M8.16.10: Type 10 Grounding and Bonding Conductors (Solid or Standard, Insulated or Bare)

This material specification has been renamed.

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The following paragraphs have been added:

Grounding and bonding conductors shall not be less than #14 AWG. Ground and bonding conductors shall be copper conforming to requirements of ASTM-B3 for soft or annealed copper wire, ASTM-B8 for stranded copper wire.

Where wire is provided with an individual covering, the covering shall be finished a continuous green color or a continuous green color with one or more yellow stripes.

The following paragraphs have been deleted:

Ground and bonding wire shall be copper conforming to requirements of ASTM-B3 for soft or annealed copper wire, ASTM-B8 for stranded copper wire.

Where wire is provided with an individual covering, the covering shall be finished a continuous green color or a continuous green color with one or more yellow stripes.

M8.16.11: Shielded Loop Detector Lead-In cable

The following paragraph has been added:

Two-conductor #14 AWG, tinned copper stranded (19 x 27) conductors, polyethylene insulated (0.032 in. thick), conductors cabled, aluminum-polyester shield (100% shielding), #16 AWG stranded tinned copper drain wire. Chrome vinyl outer jacket (0.035 in. thick), nominal cable outside diameter 0.340 in. and conform to the requirements of IMSA specification 50-2.

The following paragraph has been deleted:

Two conductor No. 14 AWG, tinned copper stranded (19 x 27) conductors, polyethylene insulated (0.032 in. thick), conductors cabled, aluminum-polyester shield (100% shielding), No. 16 AWG stranded tinned copper drain wire. Chrome vinyl outer jacket (0.035 in. thick), nominal cable outside diameter 0.340 in. and conform to the requirements of IMSA specification 50-2.

M8.16.14: Type 14 Coaxial Cable

This material specification has been added.

M8.16.15: Type 15 Cat5e Ethernet Cable

This material specification has been added.

M8.16.16: Type 16 Twisted Pair Copper Cable

This material specification has been added.

M8.16.17: Type 17 Twisted Pair Copper/Fiberoptic Hybrid Cable

This material specification has been added.

SECTION M9: MISCELLANEOUS MATERIALS

M9.10.0: Jointing Materials for Pipes

This material specification has been deleted.

SECTION M10: TRAFFIC CONTROL DEVICES

This material specification section has been added.