

Certification

For iron and steel materials and for Manufactured Products produced predominantly of iron or steel or a combination of both*, the Contractor shall submit a certification from the producer of steel or iron, or any product containing steel or iron as a component, stating that all steel or iron furnished or incorporated into the furnished product was manufactured in the United States in accordance with the requirements of the Buy America provisions of 23 CFR § 635.410, as amended. Such certification shall also include (1) a statement that the iron or steel product or component was produced entirely within the United States, or (2) a statement that the iron or steel product or component was produced within the United States, except for minimal quantities of foreign steel and iron valued at \$ (actual value). A "Buy America" Certification is required from each manufacturer, fabricator, supplier, subcontractor that engages in "manufacturing" as defined above.

**Predominantly of iron or steel or a combination of both means that the cost of the iron and steel content exceeds 50% of the total cost of all its components. The cost of iron and steel is the cost of the iron or steel mill products, castings, or forgings utilized in the manufacture of the product and a good faith estimate of the cost of the iron or steel components.*

In addition, upon completion of the project, the Contractor shall certify in writing as to overall compliance with BABA and provide the total project delivered cost of all foreign Manufactured Products and Construction Materials.

Example certification:

I hereby certify that this project is in compliance with the Build America, Buy America Act (Public Law 117- 58) requirements for this project. All Iron and Steel, Manufactured Products produced predominantly of steel or iron, Manufactured Products and Construction Materials that are permanently incorporated into the work for this project were produced in the United States of America, with the only exceptions as noted below.

As required, we will maintain all records and documents pertinent to the Build America, Buy America Act requirements, at the address given above, for not less than 3 years from the date of Final Acceptance. These files will be available for inspection and verification by the Maine Department of Transportation and/or the Federal Highway Administration.

We further certify that the total value of foreign steel and iron for this project is \$_____, said value being less than 0.1% of the total construction contract price or \$2,500.00, whichever is greater.

We further certify that the total material cost of foreign Manufactured Products and Construction Materials for this project is \$_____, said value being no more than the lesser of \$1,000,000 or 5% of total applicable costs. The term "total applicable costs" is defined as the total actual final material cost of the compliant and non-compliant iron and steel, Manufactured Products, and Construction Materials.

Signed (Contractor)

October 30, 2025

(President) (Contractor Firm)

108.1.3

(F) **Delivery Slips** - Serially pre-numbered delivery slips of acceptable size and format for stating the following minimum information shall be furnished by the Contractor, in as many copies as may be necessary. One copy shall be retained by the Resident or Inspector upon accepting delivery of the material.

- 1) Vehicle identification
- 2) Date loaded
- 3) Work identification number & location
- 4) Identification of Material:
 - a) Item number
 - b) Source location of supplier
 - c) Type and grade
 - d) Tank number from which loaded, if liquid
- 5) Quality information as necessary for bituminous liquids
 - a) Specific gravity at 60°F
 - b) Serial number of the Certificate of Analysis as furnished according to Division 700 - General Statement
 - c) The Certificate Statement as required in Division 700 - General Statement
 - d) Viscosity of the Material - ~~if asphalt cement, in poises 140°F and in centistokes at 275°F; if other bituminous liquid, the specified viscosity according to the type and grade shown in Section 702~~
- 6) Quantity information as necessary: gross, tare and net weights, volume of load if not material requiring weighing, net gallons at 60°F if bituminous liquids
- 7) Signatures (legible initials acceptable) of: Weighmaster (if weight measured material), Contractor's representative (if volume measured material), and Resident (Cover Slips).

Remove 5d

If Materials are shipped by rail, the car weight may be accepted provided that only the actual weight of material is paid for. However, car weights will not be acceptable for Materials to be passed through mixing plants. Trucks used to haul Material being paid for by weight shall be weighed empty daily, at such times as directed. Each truck shall have a legible identification mark.

Thank you!

Melanie G. Furber



MaineDOT

Regional Program

Clerk IV

Melanie.G.Furber@maine.gov

Macdougall, George

From: Pelletier, Todd
Sent: Thursday, September 25, 2025 1:51 PM
To: Macdougall, George
Cc: Folsom, Jeff
Subject: Edited Emergency language under 109.5.1

Follow Up Flag: Follow up
Flag Status: Flagged

Cive to Mel

~~What does this have to do with FEMA or ER?~~

109.5.1 Definitions - Types of Delays Delays are defined as follows and may be divided into more than one type depending upon cause.

A. Excusable Delay Except as expressly provided otherwise by this Contract, an "Excusable Delay" is a Delay to the Critical Path that is directly and solely caused by (1) a weather-related Event of such an unusually severe nature that either a Federal Emergency Disaster Declaration (FEMA eligible) or FHWA eligible Disaster Declaration/Proclamation either from the President or the Governor. FHWA must concur on a Governor's proclamation. The Contractor will be entitled to an adjustment of

time under this Section only if the Project falls within the geographic boundaries prescribed under the disaster declaration. or (2) a flooding event at the affected location of the Project that results in a Q25 headwater elevation, or greater, but less than a Q50 headwater elevation. Theoretical headwater elevations will be determined by the Department; actual headwater elevations will be determined by the Contractor and verified by the Department or (3) An Uncontrollable Event

B. Compensable Delay A "Compensable Delay" is a Delay to the Critical Path that is directly and solely caused by: (1) a weather-related Uncontrollable Event of such an unusually severe nature that either a Federal Emergency Disaster Declaration (FEMA eligible) or FHWA eligible Disaster Declaration/Proclamation either from the President or the Governor is made. FHWA must concur on a Governor's proclamation. The

Contractor will be entitled to an Equitable Adjustment under this Section only if the Project falls within the geographic boundaries prescribed under the disaster declaration and receives project-specific emergency funds, and the Contractor can show proof that the Work was delayed by this weather event, (2) an Uncontrollable Event caused by a Utility Company for which the Utility Company reimburses the Department, (3) an Uncontrollable Event caused by other third party (not Subcontractors) Working on Project-related Work within the Project Limits if, and only if, the such other third party offers the Department reimbursement for such Delay, or (4) acts by the Department that are in violation of applicable laws or the Contract, or (5) a flooding event at the affected location of the Project that results in a Q50 headwater elevation, or greater. Theoretical Q50 headwater elevations will be determined by the Department; actual headwater elevations will be determined by the Contractor and verified by the Department.

C. Inexcusable Delay "Inexcusable Delays" are all Delays that are not Excusable Delays or Compensable Delays.

done 10/1/25

requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.6.

14. The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g. mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and location at which the work was performed. Records be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.
15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

End of GOALS FOR EMPLOYMENT OF FEMALES AND MINORITIES
Federally Required Contract Document

D. Section '**D Disadvantaged Business Enterprise (DBE) Requirements**' is removed in its entirety. The DBE material is in:

Section 105.10 EQUAL OPPORTUNITY AND CIVIL RIGHTS.

SECTION 3 - OTHER FEDERAL REQUIREMENTS

Unless expressly otherwise provided in the Bid Documents, the provisions contained in this Section 3 of this "Federal Contract Provisions Supplement" are hereby incorporated into the Bid Documents and Contract.

A. Buy America *This Section Removed - see 105.11*

~~If the cost of products purchased for permanent use in this project which are manufactured of steel, iron or the application of any coating to products of these materials exceeds 0.1 percent of the contract amount, or \$2,500.00, whichever is greater, the products shall have been manufactured and the coating applied in the United States. The coating materials are not subject to this clause, only the application of the coating. In computing that amount, only the cost of the product and coating application cost will be included.~~

~~Ore, for the manufacture of steel or iron, may be from outside the United States; however, all other manufacturing processes of steel or iron must be in the United States to qualify as having been manufactured in the United States.~~

United States includes the 50 United States and any place subject to the jurisdiction thereof.

Products of steel include, but are not limited to, such products as structural steel, piles, guardrail, steel culverts, reinforcing steel, structural plate and steel supports for signs, luminaries and signals.

Products of iron include, but are not limited to, such products as cast iron grates.

Application of coatings include, but are not limited to, such applications as epoxy, galvanized and paint.

To assure compliance with this section, the Contractor shall submit a certification letter on its letterhead to the Department stating the following:

"This is to certify that products made of steel, iron or the application of any coating to products of these materials whose costs are in excess of \$2,500.00 or 0.1 percent of the original contract amount, whichever is greater, were manufactured and the coating, if one was required, was applied in the United States."

B. Materials

a. Convict Produced Materials References: 23 U.S.C. 114(b)(2), 23 CFR 635.417

Applicability: FHWA's prohibition against the use of convict material only applies to Federal-aid highways. Materials produced after July 1, 1991, by convict labor may only be incorporated in a Federal-aid highway construction project if: 1) such materials have been produced by convicts who are on parole, supervised release, or probation from a prison; or 2) such material has been produced in a qualified prison facility, e.g., prison industry, with the amount produced during any 12-month period, for use in Federal-aid projects, not exceeding the amount produced, for such use, during the 12-month period ending July 1, 1987.

Materials obtained from prison facilities (e.g., prison industries) are subject to the same requirements for Federal-aid participation that are imposed upon materials acquired from other sources. Materials manufactured or produced by convict labor will be given no preferential treatment.

The preferred method of obtaining materials for a project is through normal contracting procedures which require the contractor to furnish all materials to be incorporated in the work. The contractor selects the source, public or private, from which the materials are to be obtained (23 CFR 635.407). Prison industries are prohibited from bidding on projects directly (23 CFR 635.112e), but may act as material supplier to construction contractors.

Prison materials may also be approved as State-furnished material. However, since public agencies may not bid in competition with private firms, direct acquisition of materials from a prison industry for use as State-furnished material is subject to a public interest finding with the Division Administrator's concurrence (23 CFR 635.407d). Selection of materials produced by convict labor as State-furnished materials for mandatory use should be cleared prior to the submittal of the Plans Specifications & Estimates (PS&E).

Unless expressly otherwise provided in the Bid Documents, the following "Required Contract Provisions, Federal Aid Construction Contracts", FHWA-1273, are hereby incorporated into the Bid Documents and Contract.

Cargo Preference Act : Contractor and Subcontractor Clauses. "Use of United States-flag vessels: 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. " (Reorganization Plans No. 21 of 1950 (64 Stat. 1273) and No. 7 of 1961 (75 Stat. 840) as amended by Pub. L. 91-469 (84 Stat. 1036) and Department of Commerce Organization Order 10-8 (38 FR 19707, July 23, 1973)) [42 FR 57126, Nov. 1, 1977]

The Cargo Preference Act requirements apply to materials or equipment that are acquired for a specific Federal-aid highway project. In general, the requirements are not applicable to goods or materials that come into inventories independent of an FHWA funded-contract. For example, the requirements would not apply to shipments of Portland cement, asphalt cement, or aggregates, as industry suppliers and contractors use these materials to replenish existing inventories. In general, most of the materials used for highway construction originate from existing inventories and are not acquired solely for a specific Federal-aid project. However, if materials or equipment are acquired solely for a Federal-aid project, then the Cargo Preference Act requirements apply."

New 1273 added to Book
~~(was in Repair Spec)~~

Start of FHWA 1273 REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS (As revised through October 23, 2023)

Has been in Contract/Bid Books
for 2 years

703.19 Granular Borrow Granular borrow shall consist of sand or gravel of hard durable particles free from vegetable matter, lumps or balls of clay, frozen material and other deleterious substances. The gradation of that portion passing a 3 inch sieve shall meet the gradation requirements of the following table:

Sieve Designation	Percentage by Weight Passing Square Mesh Sieves	
	Material for Underwater Backfill	Material for Embankment Construction
No. 40	0-70	0-70
No. 200	0-7.0	0-20.0

Granular borrow for underwater backfill shall contain no particles or fragments larger than 63 inches. Granular borrow for embankment construction shall contain no particles or fragments with a maximum dimension in excess of the compacted thickness of the layer being placed.

206.03 Backfilling Backfilling shall consist of placing suitable material in all spaces excavated and not occupied by Drainage and Minor Structures, Major Structures and other permanent structures up to the elevation of the existing ground or other elevations shown in the Contract Documents. Except for underdrain backfill and for structural plate pipe units, backfill material for Drainage and Minor Structures shall be fine readily compressible soil or granular material, at, or near, optimum moisture content, and shall not contain stones larger than 3 inches, frozen lumps, chunks of clay, mineral matter or any other objectionable material. When Granular Borrow is called for in the Contract Documents to be placed around Drainage and Minor Structures, Granular Borrow, Material for Underwater Backfill, shall be used. Backfill material for Major Structures shall be Granular Borrow, Material for Underwater Backfill, or other material indicated in the Contract Documents and shall be at, or near, optimum moisture content and shall not contain ~~stones larger than 3 inches,~~ frozen lumps, chunks of clay, mineral matter or any other objectionable matter.

509.05 Structural Plate Pipes and Pipe Arches The use of cofferdams and dewatering of the stream will not be a requirement for the installation of pipes and pipe arches unless otherwise specified in the Contract Documents. Prior to placing the structure or any plates, the bed shall be brought to the required line and grade and shaped to its required section, as much as practicable. When practicable, the pipe or pipe arch shall be moved back and forth longitudinally on the bedding material to shape and compact the bedding material prior to releasing the structure in its final position. The bedding material and structure shall not be placed at times of high water. The Contractor shall obtain approval before placing the bedding material and the structure.

The specified bedding material may be omitted if the existing material under the pipe is suitable.

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When not otherwise specified in the Contract Documents, backfill shall be a selected material of a granular nature with a minimum of clay. It shall contain neither frozen material, vegetable matter nor anything that will not pass through a 3 inch square opening screen. The 3 inch size limitation shall not apply to areas 5 feet or more from the structure. When Granular Borrow is called for in the Contract Documents to be placed around Structural Plate Pipes and Pipe Arches, Granular Borrow, Material for Underwater Backfill, shall be used.

Fill material shall be deposited evenly on both sides of the structure in layers not exceeding 6 inches in depth, loose measure, until the three-quarter point is reached. It shall be thoroughly compacted under the pipe or pipe arch, on both sides of the structure. Above the three-quarter point, fill layers shall not exceed a depth of 8 inches, loose measure. Backfilling and compacting shall be done in the presence of the Resident.

534.02 Materials Structural precast elements for the arch, box culvert, or three sided frame and associated precast elements shall meet the requirements of the following Standard Specification Subsection, except as noted otherwise in this specification:

Structural Precast Concrete Units

712.061

New concrete mix designs and mix designs not previously approved by the Fabrication Engineer shall be qualified by trial batches prepared in accordance with AASHTO T 126 (ASTM C192). The test results shall demonstrate that the concrete meets the requirements of the Contract Documents.

Bedding and backfill material shall conform to the requirements of Standard Specification 703.19, Granular Borrow, Material for Underwater Backfill, ~~with the additional requirement that the maximum particle size shall be limited to 4 inches, or as shown on the Plans.~~

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SECTION 202
REMOVING STRUCTURES AND OBSTRUCTION

202.03 Removing Existing Superstructure, Structural Concrete, Railings, Curbs, Sidewalks and Bridges Amend this section by adding the following to the end:

“If damage to the structure to remain occurs, repair structural steel in accordance with Section 504.55 Field Welding and Repairs”

SECTION 202 - REMOVING STRUCTURES AND OBSTRUCTIONS

202.01 Description This work shall consist of removing wholly or in part, and satisfactory disposing of all designated buildings, ~~s~~Structures, bituminous pavement, ~~Portland-cement~~ concrete pavement, manholes, catch basins, and other obstructions which are required to be removed, except for the obstructions to be removed and disposed of under other ~~contract~~Contract items. It shall also include salvaging designated materials.

202.02 Removing Buildings The Contractor shall remove and dispose of all buildings and foundations indicated in the Contract Documents, ~~on plans or bid documents~~.

Cavities remaining as a result of foundation or ~~structure~~Structure removal shall be filled to the level of the surrounding ground and, if within the limits of embankment or below the subgrade in excavation areas, shall be compacted in accordance with applicable embankment construction requirements.

Details of the ownership of the buildings and all the equipment, fixtures and materials therein, except equipment belonging to a Utility or equipment or fixtures specifically excepted and details relative to the date of availability of the property, will be stated elsewhere in the Contract Documents, ~~in the Special Provision~~.

Written notice will be given the Contractor when any building becomes available before the date specified in the Contract Documents, ~~special provision~~. On the above-specified date, or upon notice of availability, ownership of the buildings shall transfer from the State to the Contractor who then shall proceed with the work required under this section. The buildings shall not be used or occupied for any purpose while in the right-of-way and the buildings shall be removed as soon as possible after the date available, unless otherwise allowed, ~~authorized~~.

~~If, during the negotiations between the Department and the owners of the building specified under this section, agreements are made with the owners to move, remove or raze the buildings, the Department reserves the right to remove any or all items from the contract upon written notice to the Contractor and no payment will be made for the items. Removal of debris, when necessary under such conditions, will be accomplished under Section 629—Hand Labor and Section 631—Equipment Rental.~~

All debris and unusable materials shall be removed to an approved dump or waste area and buried or removed to an approved landfill. No material shall be disposed of by burning. For a related provision, see Department of Environmental Protection Maine Solid Waste Management Rules, 06-096 CMR Ch. 401, Landfill Siting, Design and Operation.

202.03 Removing Existing Superstructure, Structural Concrete, Railings, Curbs, Sidewalks, Railings and Bridges Removing existing superstructures shall consist of removing and disposing of existing superstructure including fill, pavement, railing, and all other material on or over the superstructure unless otherwise specified. Removing existing

structural concrete shall be to the limits designated in the Contract Documents on the plans and shall be accomplished without damage to the portion of the ~~structure~~Structure to remain.

Removing existing bridge shall be to the limits shown in the Contract Documents, on the plans.

Existing concrete curbs, granite curbs, and concrete sidewalks shall be removed to the limits shown in the Contract Documents on the plans using equipment such as a chipping hammers or pavement breakers of a size approved by the Resident, or any other method approved by the Resident, which will not damage the structural integrity of the concrete deck to remain.

Before removal of existing concrete curbs or sidewalks as indicated in the Contract Documents, the fascia removal line as indicated on the plans, shall be saw-cut to a depth of 1 inch, minimum. Care shall be taken not to damage any reinforcing steel that is to remain in the Structure, bridge.

When any ~~the~~ materials from an existing ~~S~~structure are to be retained by the Department, the Contractor shall carefully dismantle ~~them~~it, and all materials, except those that may be specified to be reused in the new ~~structure~~Structure, shall be loaded on trucks supplied by the Contractor, transported to the MaineDOT facility identified elsewhere in the Contract Documents, or as directed by the Resident, and unloaded by the Department, unless otherwise specified in the Contract Documents. ~~Department or carefully stored by the Contractor within the right-of-way.~~ The use of any portion of the salvaged material in connection with new or temporary construction shall not be anticipated by the Contractor. The dismantling of metal ~~structure~~Structures or railings shall, when explicitly provided, include the removal of all bolts and ~~fasteners rivets~~ necessary to disconnect the members and the matchmarking of these members for future reassembling.

When the materials from an existing ~~structure~~Structure are designated to become the property of the Contractor, ~~they~~it shall be entirely removed and disposed of out of sight of the highway and beyond the limits of the right-of-way. Such materials shall not be deposited in rivers, streams, or other bodies of water. If the material is to be wasted, then it shall be disposed of at an approved location.

When practical, any suitable material removed shall be used in backfilling or for the formation of embankments and no additional allowances for payment will be made. Unsuitable or surplus material shall be disposed of in an approved waste area.

Blasting or other operations necessary for the removal of an existing ~~structure~~Structure or obstruction, which might damage new construction, shall be completed before installing ~~placing~~ the new work. If this is not feasible, the work shall be done only when approved and entirely at the Contractor's risk.

202.031 Removing Existing Bituminous Pavement and Concrete Wearing Surface from Bridges and Scarifying the Top of Deck The full depth of existing bituminous pavement, or

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concrete wearing surface shall be removed from curb to curb for the entire length of the bridge. Membrane waterproofing, if present, shall also be removed in a manner approved by the Resident.

Extreme care shall be taken to avoid damaging the top of the concrete deck to remain. All existing deck concrete, that is not otherwise specified to be removed or repaired, that is damaged by the Contractor, ~~which is not specified to be scarified or rehabilitated,~~ shall be repaired. ~~Such repair shall be~~ at the expense of the Contractor.

When ~~repair rehabilitation~~ of the top of the deck is called for in the Contract Documents, on the plans, the work ~~shall will~~ be done in accordance with Standard Specification Section 518, Structural Concrete Repair. —Rehabilitation of Structural Concrete Bridge Decks.

~~When scarifying the top of the deck is called for, the specified depth of material shall be removed from curb to curb for the entire length of the bridge. Removal shall be accomplished by an approved scarifying machine. Areas that cannot be removed by a scarifying machine, such as adjacent to curbs, drains, and armored joints, shall be removed by using a maximum 35 pound chipping hammer or pavement breaker.~~

202.03204 Removing Portland Cement Concrete Pavement All ~~Portland cement~~ concrete pavement and ~~Portland cement~~ concrete base course designated for removal shall be broken into pieces suitable for use in construction ~~of or~~ embankment or disposed of as directed by the Resident. When used in construction of embankments, the maximum size of any fragment shall not exceed the thickness of the layer being placed. The Contractor may, at their option and with approval of the Resident, dispose of material in approved waste areas and replaced d with an equivalent volume of granular borrow at no cost to the Department, State.

202.0405 Removing Manholes or Catch Basins Where the manhole or catch basin is under a ~~R~~roadway ~~ore~~f embankment, the sides shall be removed to a depth of at least 2 feet below subgrade. When the Contract Documents plans do not provide for the complete removal of pipe(s) connecting to the catch basin or manhole, said pipe: (1) if to be connected to new pipe, shall not be disturbed, or (2) if no connection is called for, the pipe shall be tightly plugged with mortared masonry. Floors of the ~~structure~~ Structures shall be broken up or removed to permit drainage. The open cavity shall be filled with earth and thoroughly compacted.

202.0506 Removing Bituminous Concrete Pavement This work involves removing bituminous pavement from Roadways, down to gravel. The equipment for removing the bituminous pavement shall be capable of removing scarifying and loading the bituminous pavement without including any gravel, except that adhering to the pavement. The remaining gravel shall be graded to drain as approved by the Resident.

202.051061 Removing Pavement Surface ~~The equipment for removing the bituminous surface shall be a power operated milling machine or grinder capable of removing bituminous concrete pavement to the required depth, transverse cross slope, and profile grade by the use~~

~~of an automated grade and slope control system. The controls shall automatically increase or decrease the pavement removal depth as required, and readily maintain desired cross slope, to compensate for surface irregularities in the existing pavement course. The equipment shall be capable of accurately establishing profile grades by referencing from a fixed reference such as a grade wire, or from the existing pavement surface using a 30-foot minimum contact ski (floating beam), or 24-foot non-contact grade control beam.~~

~~—The Contractor shall locate and remove all objects in the pavement through the work area that would be detrimental to the planing or grinding machine.~~

~~—The finished milled surface will be inspected before being accepted, and any deviations in the profile exceeding ½ inch under a 16-foot string line or straightedge placed parallel to the centerline will be corrected. Any deviations in the cross slope that exceed ¾ inch under a 10-foot string line or straightedge placed transversely to centerline will be corrected. All corrections will be made with approved methods and materials. Any areas that require corrective measures will be subject to the same acceptance tolerances. Excess material that becomes bonded to the milled surface will be removed to the Resident's satisfaction before the area is accepted. The equipment for removing the bituminous surface shall be a power operated milling machine or grinder capable of removing bituminous concrete pavement to the required depth, transverse cross slope, and profile grade using an automated grade and slope control system. The controls shall automatically increase or decrease the pavement removal depth as required, and readily maintain desired cross slope, to compensate for surface irregularities in the existing pavement course. The equipment shall be capable of accurately establishing profile grades by referencing from a fixed reference such as a 30-foot minimum contact ski (floating beam), 24-foot non-contact ski (floating beam) with 3 or more sensors; or 3 non-contact sensors directly affixed at the fore, mid, and aft points of the milling machine. Systems designed to incorporate a contact sensor located at the mid-point of the milling machine in lieu of the non-contact sensor will be permitted. Grade control sensors shall all be located on the same side. A single sensor, contact or otherwise, shall not be permitted unless otherwise approved by the Department.~~

The rotary drum shall be a minimum of 7 feet in width and utilize carbide tip tools at a minimum triple wrap configuration. The difference in height from the top of any ridge to the bottom of the groove adjacent to that ridge shall not exceed ¼ inch. The forward speed of the milling machine shall be adjusted to produce a milled surface meeting the groove spacing, groove depth, and surface tolerance requirements of this specification. The tools on the revolving cutting drum must be continually maintained and shall be replaced as warranted to provide a uniform pavement texture. The Department may evaluate the texture of the milled surface for information purposes by performing the Sand Patch test according to ASTM E 965.

The Contractor shall locate and remove all objects in the pavement through the work area that would be detrimental to the milling or grinding machine. Any structures or obstructions left within the travel lane or shoulders shall have tapers installed according to Standard Detail 202(01). The finished milled surface will be inspected before being accepted, and any deviations in the profile exceeding ½ inch under a 16-foot string line or straightedge placed

parallel to the centerline will be corrected. Any deviations in the cross-slope that exceed $\frac{3}{8}$ inch under a 10-foot string line or straightedge placed transversely to centerline will be corrected. All corrections will be made with approved methods and materials. Any areas that require corrective measures will be subject to the same acceptance tolerances. Excess material that becomes bonded to the milled surface will be removed to the satisfaction of the Resident before the area is accepted.

On roadways with adjoining lanes carrying traffic, the Contractor shall remove the pavement surface in each lane per the conditions in Table 1, unless otherwise noted in Special Provisions.

TABLE 1: MILLING CONDITIONS FOR ADJOINING LANES

<u>Depth (At Centerline)</u>	<u>Milling Conditions</u>
<u>Vertical Longitudinal Joint</u>	
<u>2" and less</u>	<u>The Contractor may remove the pavement on a single travel lane width for each production day and will be required to mill the adjacent section of travel lane before the end of the following calendar day.</u>
<u>Greater than 2"</u>	<u>The Contractor shall remove the pavement over the full width of the traveled way section being paved that day.</u>
<u>12:1 Tapered Centerline Joint</u>	
<u>1 ½" to 2"</u>	<u>The Contractor may remove the pavement on a single travel lane width for each production day and will be required to mill the adjacent section of travel lane before weekend or holiday suspension. A maximum unmatched centerline joint length of 0.5 miles will be permitted over the weekend.</u>
<u>Greater than 2"</u>	<u>The Contractor shall remove the pavement on a single travel lane width for each production day and will be required to mill the adjacent section of travel lane before the end of the following calendar day.</u>

The Contractor will be required to remove the pavement over the full width of the mainline traveled way, regardless of highway type, cut depth, or longitudinal joint type prior to Memorial Day, July 4th, Labor Day, suspensions exceeding three days, or other dates as specified by Special Provision.

The Contractor will also be responsible for installing additional warning signage that clearly defines the centerline elevation differential hazard. Unless otherwise addressed in the Contract, the Contractor shall install additional centerline delineation such as a double RPM application, or temporary painted line. The Traffic Control Plan shall be amended to include this option and the additional requirements. All signs and traffic control devices will conform to Section 719.01, and Section 652, and will be installed prior to the work, at a maximum spacing of 0.50 mile for the entire length of effected roadway section. If this option is utilized, all additional signing, labor, traffic control devices, or incidentals will not be paid for directly, will be considered incidental to the appropriate 652 items.

On roadways with immediately adjacent shoulders, the Contractor shall remove the pavement surface in each lane per the conditions in Table 2, unless otherwise noted in Special Provisions.

TABLE 2: MILLING CONDITIONS FOR THE EDGE OF TRAVELED WAY

<u>Depth (At Edge of Traveled Way)</u>	<u>Conditions</u>
<u>2" and less</u>	<u>The Contractor may leave a vertical edge joint exposed for up to 21 days after milling is performed. The Contractor shall treat vertical edge joints exposed beyond 21 days per the criteria below.</u>
<u>Greater than 2"</u>	<u>The Contractor shall treat vertical edge joints exposed per the criteria below.</u>

When required by Table 2, the Contractor shall treat vertical edge joints through one of the options below:

1. The vertical edge shall be tapered to a zero edge by means of milling a 12:1 transition from the edge of traveled way onto the shoulder before opening the lane to traffic. Tapers shall be removed to form a vertical edge prior to the placement of the new pavement course. No additional payment will be made for tapers, or taper removal.
2. An additional 2 feet of pavement shall be removed from the shoulder to eliminate the vertical edge at the edge of travelway before opening the lane to traffic. Unless otherwise authorized by the Department, no additional payment will be made for the additional milling.
3. A pavement layer shall be placed to reduce the vertical edge to 1 inch or less before opening the lane to traffic.

As a minimum, the use of temporary painted line, or RPMs placed along the edge of traveled way at 200-foot intervals is required for all elevation differentials. When pavement milling is extended into the shoulder (including milled tapers), appropriate channelization devices shall be placed 2 feet outside the edge of the vertical face at intervals not exceeding 600 feet, and RPMs shall be placed on the remaining pavement surface along the vertical edge at 200-foot intervals. Uneven pavement signs shall be placed at a maximum spacing of ½ mile when any pavement milling operations leaves an exposed uneven pavement surface.

Weepers shall be ground across the full width sections adjacent shoulders or remaining pavement surface matching the milled travel way or shoulder milled depth to minimize water ponding in any lanes carrying traffic. Weepers shall typically be 18 - 24" inches in width, installed along each lane, at a frequency of approximately one per half mile at locations as directed by the Resident or in areas that will provide drainage for the milled areas. Installation of weepers will not be paid for directly but will be considered incidental to the pavement removal item. The replacement of mix in the weeper locations shall be performed concurrently within the pavement placement operation closure using the appropriate HMA item produced for the Contract or a MaineDOT approved 9.5mm HMA. There will be no separate payment for repaving the weeper locations as they are considered incidental to the square yard price of the pavement removal item.

The milled surface shall be cleaned of all material resulting from the pavement removal operation. Loaders, skid steers, motorized side cast brooms, sweeper pick up brooms, vacuum pick up machines and hand labor may be used in any number or sequence as determined by the Contractor in order to clean the milled surfaces to the satisfaction of the Department before acceptance and opening the area up to traffic. The use of compressed air may be required to loosen any bonded materials from the surface to aid in cleaning.

Any areas of concern, such as delamination or potholing shall be identified on a continuous basis as milling progresses. Proper corrective action will be determined by the Resident and paid for under the appropriate Contract items, and if required, completed prior to opening lane to traffic. Any issues that arise up to 7 calendar days after being milled will be the responsibility of the Department, unless otherwise noted in Special Provision.

202.052062 Pavement Butt Joints The equipment for removing the bituminous surface shall be a cold milling machine or a power-operated planer capable of removing the existing pavement to the required depth, width, grade, and slope.

The milled surface shall have a uniform texture and provide acceptable rideability for vehicles. Should resurfacing be delayed, or the resulting milled surface is unsatisfactory for any reason, a bituminous leveling course or temporary pavement may be required. The Contractor shall clean the milled surface and surrounding area of all loose material prior to use by traffic.

202.0607 Method of Measurement Removing buildings, removing existing superstructures, and removing existing bridges will each be measured by the lump sum.

Removing ~~Portland cement~~ concrete pavement, removing bituminous ~~concrete~~ pavement, pavement butt joints, and removing pavement surface will be measured by the square yard with no deductions made for areas occupied by existing catch basins and manholes.

Removing existing structural concrete will be measured either by the cubic yard in place before work starts on the particular portion of the ~~structure~~ Structure to be removed, or by the lump sum, as specified.

Removinge existing railings will be measured by the linear foot in place along the grade and line of the railing from outside to outside of end posts or rail projections, whichever is greater.

~~The r~~Removing of existing bituminous pavement, removing existing concrete wearing surface, and removing of existing concrete curbs and sidewalks from bridges, ~~and scarifying of the concrete deck~~ will each be measured for payment as one lump sum unit, complete, and accepted.

The removing of existing manholes and catch basins will be measured by each unit removed, the unit.

~~202.0708~~ Basis of Payment The accepted quantity of removing building, removing existing superstructure, and removing existing bridge will be paid for at the ~~contract~~Contract lump sum price, which price shall be full compensation for removing and disposing of the obstructions and building foundations down to an elevation matching the surrounding ground, as indicated elsewhere in the Contract Documents or as directed by the Resident.

Removing ~~Portland cement~~ concrete pavement will be paid for at the ~~contract~~Contract unit price per square yard which price will be full compensation for removing and disposing of pavement and pavement reinforcement.

Material for backfilling holes resulting from removal of obstructions will be measured and paid for as provided in Section 203 - Excavation and Embankments.

The quantity of structural concrete removed will be paid for, either at the ~~contract~~Contract unit price per cubic yard or at the ~~contract~~Contract lump sum price which price shall include disposal of the concrete.

The quantity of railing removed will be paid for at the respective ~~contract~~Contract unit price per linear foot of railing removed and disposed of, whether it is retained by the Department or becomes the property of the Contractor.

Removing ~~and scarifying existing concrete, removing~~ existing concrete wearing surface, and removing of existing bituminous pavement from bridges will be paid for at the ~~contract~~Contract lump sum price for the respective ~~contract~~Contract Ppay Item involved. Payment for Removing membrane waterproofing, if present on the existing deck, shall be considered incidental to the removing of bituminous pavement.

~~The containment and disposal of pollutants during the removal of materials from an existing bridge will not be paid for directly but shall be incidental to the related contract Pay Item. These payment provisions shall prevail over those of Section 656—Temporary Soil Erosion and Water Pollution Control, for this work only. The payment for each contract pay item will be full compensation for furnishing all materials, labor, equipment for all formwork, and for all other incidentals necessary to complete the work.~~

Removing existing manholes and catch basins will be paid for at the ~~contract~~Contract unit bid price each, which price shall include all work, materials, labor, and equipment. New pipe as required by the Contract Documents plans will be paid for separately under the appropriate Ppay Item. Where new pipe is to be connected to existing pipe, the Contractor shall furnish and install, at their expense, pipe necessary to replace any existing pipe damaged beyond the limits of pipe removal shown in on the Contract Documents plans.

Removing bituminous ~~concrete~~ pavement will be paid for at the ~~contract~~Contract unit price for the number of square yards removed as required by the Contract Documents plans.

or as ordered by the Resident, which price will be full compensation for removing and disposing of the bituminous pavement and re-grading of the remaining material.

The accepted quantity of pavement butt joints will be paid for at the ~~contract~~Contract unit price per square yard which price will be full compensation for removing and salvaging the bituminous material. Any bituminous leveling material or temporary pavement required will not be measured for payment directly, but will be considered incidental to the related ~~contract~~Contract Pay Items.

~~The accepted quantity of removing pavement surface will be paid for at the contract unit price per square yard. This price will be full compensation for removing the material to the required depth, profile and cross slope, complete cleaning of the milled surface suitable for paving, and for salvaging, hauling, and stockpiling excess material to an approved designated area. Locating and removing objects, and additional milling and paving required to correct deviations will not be paid for separately but will be included in the contract unit price per square yard.~~

The accepted quantity of removing pavement surface will be paid for at the Contract unit price per square yard or at the Contract hourly rental price and will be full compensation for mobilizing to the site, de-mobilizing from the site, labor, supervision, cleaning of the milled surface, and all other incidentals required to complete the work. Hauling and stockpiling of the material will not be paid for directly but will be considered incidental to the milling items. Trimming to create a vertical face along curb line, guardrail, or around structures will be considered incidental to the milling items. Additional trimming beyond the incidental work described will be paid under the appropriate rental items as listed in the Contract.

Square Yard: Payment will be made at the Contract unit price for the number of square yards removed.

Hourly: Payment will be made at the Contract unit price for the number of hours of operation removing pavement surface as directed by the Resident. The equipment used for pavement removal shall be operated at the minimum speed of 50 fpm, unless the Resident directs otherwise for milled surface quality reasons, or traffic control limitations impact pavement removal operations, or site conditions make operations at the prescribed rate unreasonable.

When the Ppay Item calls for material to be retained by the Department, payment shall include the salvage of these materials, custody, preservation, loading and delivery, and storage on the right-of-way and disposal as provided herein.

When the ~~Contract proposal~~ does not include Ppay Items for removal of ~~structure~~Structures and obstructions as provided in this Section, such work shall be incidental to the various ~~contract~~Contract Ppay Items and no direct payment will be made except that removal of foundations and ~~Portland cement~~ concrete pavement will be paid as provided in Section 203, —Excavation and Embankment.

The containment and disposal of pollutants during the removal of materials from any Structure, Roadway or obstruction ~~existing bridge~~ will not be paid for directly but shall be incidental to the related Cecontract Pay Item. ~~These payment provisions shall prevail over those of Section 656 Temporary Soil Erosion and Water Pollution Control, for this work only.~~

The payment for each Cecontract Ppay Item will be full compensation for furnishing all materials, labor, equipment ~~for all formwork~~, and for all other incidentals necessary to complete the work.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
202.08 Removing Building No. ____	Lump Sum
202.09 Removing Existing Superstructure — Retained by Department	Lump Sum
202.10 Removing Existing Superstructure — Property of Contractor	Lump Sum
202.11 Removing Portland Cement Concrete Pavement	Square Yard
202.12 Removing Existing Structural Concrete	Cubic Yard
202.121 Removing Existing <u>Structural</u> Concrete ____	Lump Sum
202.123 Scarifying Concrete Deck Top xx inch	Lump Sum
202.127 Removing of Existing Bituminous Pavement <u>from Bridges</u>	<u>Lump Sum</u>
202.128 Removing of Existing Concrete Curbs & Sidewalks <u>from Bridges</u>	Lump Sum
202.13 Removing Existing Railings Retained by Department	<u>Linear</u> Foot
202.14 Remov <u>inged</u> Existing Railings Property of Contractor	<u>Linear</u> Foot
202.15 Removing Existing Manhole or Catch Basin	Each
202.17 Removing Existing Structural Concrete	Lump Sum
202.19 Removing Existing Bridge	Lump Sum
202.20 Removing Bituminous Concrete Pavement	Square Yard
202.202 Removing Pavement Surface	Square Yard
<u>202.20201 Removing Pavement Surface (Hourly)</u>	<u>Hour</u>
202.203 Pavement Butt Joints	Square Yard
202.30 Removing Existing Concrete Wearing Surface <u>from Bridges</u>	<u>Lump Sum</u>

Standard Specification Section 203, Excavation and Embankment:

Revise Subsection 203.16, Winter Construction of Embankments, as follows:

203.16 Winter Construction of Embankments Frozen material shall not be ~~used placed~~ in the ~~construction of embankments. core embankment.~~ The construction of embankments may continue during freezing weather only when all frozen material in the top of the ~~embankments, successive layers of the embankments~~ ~~core embankment~~ or the existing ground ~~under the embankments is removed prior to is moved to the waste area before~~ placing additional material. When this procedure results in additional borrow quantity, the additional borrow will not be paid for directly. ~~If allowed by the Resident, the excavated frozen material removed may be placed outside of the limits of an assumed 1.5:1 (horizontal to vertical) slope from the break in the shoulder and inside the design slope line, provided the design slope is flatter than 2:1 (horizontal to vertical).~~

Commented [E51]: From Vtrans Standard Spec.

Excavated frozen material which will be suitable when dry shall be allowed to thaw and then be placed in the embankment. No additional payment will be made for the storing and rehandling of these materials.

Commented [E52]: This wording is paraphrased from the NHDOT Standard Spec and modified to match Standard Detail 203.01, Muck Excavation and Waste Disposal.

Commented [E53]: Paraphrased from the MassDOT Standard Spec.

Compaction shall be in accordance with the specified method of embankment construction. When the prevailing temperatures are below 30°F, all material used in embankment construction shall have a moisture content, at the time of compaction, equal to or less than the optimum moisture content.

~~The embankment shall not be constructed upon frozen material except that such construction of embankments may be allowed providing the total depth of the added fill, including bases, plus the depth of the frozen material beneath does not exceed 5 feet. Frozen material may be left in the embankment only if it has been compacted as specified before freezing. The Contractor shall not resume construction of any embankments built in this manner until all frozen material has thawed. If test holes are required to make this determination they shall be dug and backfilled with satisfactory compaction at the Contractor's expense. Before additional material is added, uncompacted material on the surface of such embankments shall be either recompacted in accordance with the specified method of embankment construction or removed.~~

Standard Specification Section 304, Aggregate Base and Subbase Course:

Revise Subsection 304.03, Placing, as follows:

304.03 Placing The maximum compacted thickness of any base or subbase course layer shall not exceed 12 inches unless the Contractor demonstrates by a test section that the required compaction can be obtained. If compacted layers more than 12 inches are allowed, the Contractor shall agree to make the necessary excavations and backfilling in the course for the Resident to determine the density.

When layers are constructed of differently graded aggregate, fine grading of the lower layer will not be required except when millings are placed as the upper most layer. In this case the coarse graded base layer shall be fine graded to $\pm \frac{3}{4}$ inch and compacted to the required specification prior to placing the layer of millings. The layer of millings shall then be placed, shaped, and compacted within the tolerances specified below.

Each layer of aggregate shall be placed over the full width of the section except, the Resident may authorize the Contractor to place less than full width layers, when existing traffic or other conditions restrict operations over the full width of the section. When the Contractor places material to complete the full width, the exposed edge of the previously placed aggregate shall be cleaned of all contamination before additional base or subbase aggregate is placed adjacent to it.

~~Aggregate base and subbase courses may be placed upon frozen surfaces when such surfaces have been properly constructed.~~

The material as spread shall be well mixed with no pockets of either fine or coarse material. Segregation of large or fine particles will not be allowed.

Under Standard Specification Section 206.01, Description, revise the definitions of the terms Drainage and Minor Structures and Major Structures, as follows, in red:

Drainage and Minor Structures shall include pipe culverts, pipe arches, underdrains, catch basins, manholes, structural plate units, box culverts, **three-sided box culverts**, culvert end walls **and wingwalls**, concrete steps and other minor structures.

Major Structures shall include abutments and piers for bridges, **cast-in-place** rigid frame structures, and **concrete and** masonry retaining walls.

Meservier, Patrick P

From: Macdougall, George
Sent: Friday, October 17, 2025 9:43 AM
To: Furber, Melanie G
Subject: FW: Spec Change

From: Bickford, Scott
Sent: Wednesday, September 24, 2025 7:50 AM
To: Macdougall, George <George.Macdougall@maine.gov>
Subject: Spec Change

George,
I found an area that needs to be de-Crowded

304.02 – table – Change note #2 to “When designated on the plans, Subbase Course, Gravel-Type E may be use below the top 9” of the subbase layer at Contractor’s option.”

Scott

Geotechnical Changes – 2025 Standard Specifications

501.041

add that the Contractor shall submit to the Resident, for review and approval, an itemized list of pile order lengths, prior to ordering pile.

501.043

In "Location and Alignment Tolerance" add "Swinging leads, when used, shall be fitted with a pile gate at the bottom of the leads. The leads shall be adequately embedded in the ground or the pile constrained in a template to maintain alignment."

In "Location and Alignment Tolerance" add that pile shall not be out of skew by more than 10 degrees.

In "Location and Alignment Tolerance" add that at the discretion of the Resident, a driving template may be required to hold the piles in place to meet tolerance requirements

Add that, with the approval of the Resident, vibratory hammers may be permitted to initially set up to a distance of 10 feet above the expected tip elevation.

501.05b

In "b. Piles Furnished" change 2nd to last sentence to "When additional lengths of pile are necessary, the proposed additional length will be submitted by the Contractor to the Resident for review and approval. The approved additional length of piling will be included in the length of pile furnished.

501.046

In 5th paragraph of "Dynamic Pile Tests" add to the last sentence "At the direction of the Resident, the final driving criteria may vary from that in the final written report."

In 4th paragraph of "Dynamic Pile Tests" add this before the last sentence: "Piles will not be cut off until end of drive (EOD) and restrike (BOR) numerical evaluations (signal matching) have been performed and this information, along with the final recommended driving criteria is submitted and reviewed by the MaineDOT."

In 4th paragraph of "Dynamic Pile Tests" add that for piles that end bear in soil, the initial and final driving criteria shall be specified for 6 consecutive inches.

Under "Dynamic Pile Tests" add that, with the approval of the Resident, dynamic load tests may be monitored for less than the full length of the test pile.

677.11

Current specification requires the gravel borrow backfill to be compacted to 92 percent of maximum density as determined by AASHTO T180, Method C or D. Change the compaction requirement to 95 percent of maximum density as determined by AASHTO T180, Method C or D.

Standard Specification Section 502.13, Finishing Concrete Surfaces:

F Saw Cut Grooving of Concrete Wearing Surfaces A saw cut grooved finish shall be applied to concrete wearing surfaces. This work shall be performed using a multi-bladed diamond wet saw using circular saw blades. The Resident may allow the use of a single blade, circular saw tool, where it is determined that such equipment is necessary to complete the work, as required. The equipment the Contractor proposes to use will be subject to the approval of the Resident, prior to use.

Saw cutting may begin only after the specified curing period has elapsed. Cut all grooves in a rectangular shape conforming to the following dimensions:

Width: 1/8 inch +/- 1/32 inch
Depth: 1/4 inch +/- 1/16 inch

Unless otherwise specified in the Contract, terminate grooves 4 to 12 inches away from curbs, parapets, drainage structures, bridge joints, medians and exposed edges of the structural concrete slab.

During the grooving operations, the Resident will verify, at random, that the minimum grooved depth is being achieved. If the Resident determines that the minimum groove depth is not being achieved, then the Contractor shall stop grooving operations and make all adjustments necessary, as well as any repairs, as required by the Resident.

The Contractor shall supply the Resident with two (2) accurate, easily readable, gauges with which to verify groove depth. Deliver the gauges and applicable manufacturer's instructions for use no later than 7 Days prior to the anticipated start of grooving operations.

~~Any Slurry~~; or debris, ~~generated by from~~ the grooving operation will not be allowed to accumulate or harden and shall be prevented from flowing into drains, onto the roadway slopes or water bodies below or adjacent to the bridge. Residue shall be continuously removed. The slurry ~~and or~~ debris, shall be disposed of properly by the Contractor.

Only rubber tired vehicles are allowed on the bridge deck after saw cut grooving.

Saw cutting concrete produces silica fume dust. Include Saw Cut Grooving of Concrete Wearing Surfaces in the Health and Safety Plan.

Saw cut grooves shall be ~~either transverse or~~ longitudinal. Cut longitudinal grooves parallel to the bridge centerline, or working line, using continuous passes. On curved alignments, longitudinal grooves shall be parallel to the centerline of construction or working line. Spacing of longitudinal grooves shall be 1-1/2 inches. Spacing does not need to be varied.

~~, as specified in the Contract Documents:~~

- ~~1. Transverse Saw Cut Grooves. Cut transverse grooves perpendicular to the centerline of the roadway using a single pass.~~

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Tab stops: Not at 1.06"

The grooves shall be randomly spaced. The random spacing shall range from 1-1/4 inches to 2 inches, with 50 percent of the spacings being less than, or equal to, 1-1/2 inches. The Contractor shall submit a spacing pattern to the Resident for approval.

An example of an acceptable random pattern is 1-1/4, 1-1/2, 1-3/8, 1-1/4, 1-3/4, 1-1/2, 2, 2, 1-1/2, 1-1/4, 1-3/8, 2, 1-5/8, 1-1/4, 1-1/2, 1-1/2, 1-3/4, 2, and 1-5/8, with all spaces measured in inches. Spacings should not be based solely on multiples of 1/4 inch, because the result will not be truly random (e.g., do not use a pattern such as 1-1/4, 1-1/4, 1-3/4, 2, 1-1/2, 2, 2, etc.).

2. Longitudinal Saw Cut Grooves. ~~Cut longitudinal grooves parallel to the bridge centerline, or working line, using continuous passes. On curved alignments, longitudinal grooves shall be parallel to the centerline of construction or working line.~~

~~Spacing of longitudinal grooves shall be 1-1/2 inches. Spacing does not need to be varied.~~

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502.14 Curing Concrete All concrete surfaces shall be kept wet with clean, fresh,

8/17/25 502-712

SECTION 502 STRUCTURAL CONCRETE

502.03 Materials Replace the title, "Portland Cement and Portland Pozzolan Cement" with the following:

"Portland Cement and Blended Hydraulic Cement" 701.01"

Add the following:

"Accelerating, Chemical Admixtures" 701.0501"

Replace the title, "Fly Ash" with the following:

"Coal Ash and Natural Pozzolans" 701.10"

Replace the title, "Ground Granulated Blast Furnace Slag" with the following:

"Slag Cement" 701.13"

Commented [TC1]: Updated language to meet latest AASHTO standards.

502.04 Shipping and Storage Replace paragraph one, "The cement shall be..." and two, "Fly ash and Slag..." from this section with the following:

"All improperly stored or delivered cementitious materials will be rejected. All moisture contaminated cementitious materials will be rejected."

Commented [TC2]: Moved this language to 700 section.

502.041 Testing Equipment Replace note 9 "The curing box...", under subsection, H "Curing Boxes for concrete cylinders", with the following:

- 9 "The curing box shall be suitable for maintaining internal temperatures as specified in AASHTO T 23."

502.05 Composition and Proportioning Replace this section with the following:

"502.05 Composition and Proportioning Concrete shall be composed of a homogeneous mixture of Portland cement or Portland cement with coal ash, natural pozzolan, silica fume, or slag cement, fine aggregate, coarse aggregate, water and admixtures proportioned according to these Specifications and shall conform to the requirements of Table 1. All material shall be approved by the Department prior to use."

Table 1

Concrete CLASS	Compressive Strength (PSI)	Permeability as indicated by Surface Resistivity (KOhm-cm)	Entrained Air (%)		Notes
	LSL	LSL	LSL	USL	
LP	5,000	17	5.0	8.0	1,2,3
A	4,000	14	5.0	8.0	1,2,3
Fill	3,000	N/A	5.0	8.0	2,3
S	3,000	N/A	N/A	N/A	2,3

Commented [TC3]: Cleaned up table. Moved Class P to 534.

Note #1 Permeability testing for all concrete mixes will be done at 56 days. Concrete expected to be exposed to deicing salts prior to the test date shall be sealed with a protective coating, in accordance with Standard Specification Section 515, Protective Coating for Concrete Surfaces, at no additional cost to the Department.

Commented [TC4]: Mike Praul from FHWA mentioned 120 day requirement is no longer needed. Was originally added to ease industry concerns.

Note #2 Compressive strength testing for all concrete mixes will be done at 56 days.

Commented [TC5]: FHWA recommendation and better represents quality potential of QA sample.

Note #3 Coarse aggregate for concrete shall meet the requirements of Section 703.02 for Class "A" or "AA" or, with Department approval, SP1 or SP2 (refer to Standard Specification Section 518, Structural Concrete Repair).

Each concrete mix design shall be submitted by the Contractor to the Department for approval. No concrete shall be placed on a project until the concrete mix design is approved by the Department. Approval by the Department will be contingent upon the ability of the mix design proportions to meet concrete strength and permeability requirements and other factors that affect durability.

Commented [TC6]: Moved from paragraph below

For the first time use of a concrete batch plant or a change in pozzolan source or type, the Department may require trial batching. When required, the Contractor shall conduct a trial batch at the concrete plant utilizing transit mixers. The Contractor shall submit four clearly identified 4-inch diameter x 8-inch high cylinders to the Department, at least 15 days prior to the first placement, for permeability testing. Full documentation shall be submitted with the cylinders and must include actual batch weights and all concrete test properties. The cylinders shall be submitted between the ages of 2 and 7 days.

The mix design submitted by the Contractor shall include the following information:

- A. Description of individual coarse aggregate stockpiles, original source, bulk specific gravity, absorption, gradation, and alkali silica reactivity test results. A combined coarse aggregate blended gradation shall be provided, including the percentage of each coarse aggregate used.
- B. Description of fine aggregate, original source, bulk specific gravity, absorption, colorimetric, gradation, Fineness Modulus (F.M.), alkali-silica reactivity and sand equivalent test.
- C. Description and original source and amount of cement and pozzolanic material.
- D. Target water-cementitious material ratio (w/cm).
- E. Target water content by volume.
- F. Target strength.
- G. Target air content, slump and concrete temperature.
- H. Target concrete unit weight.
- I. Type, manufacturer, and dosages of chemical admixtures.
- J. Target KOhm-cm Value

When pozzolans are used as portland cement replacement. Concrete mix designs shall follow Table 1A below.

Table 1A

Pozzolan or Cementitious Material	Replacement Specification Limit
	USL
Coal Ash (Class C)	50 percent
Coal Ash (Class F)	30 percent
Slag Cement	50 percent
Silica Fume	15 percent
Natural Pozzolan, Metakaolin (Class N)	20 percent
Natural Pozzolan, Calcined Clay or Shale (Class N)	35 percent
Total Coal Ash and Silica Fume (when applicable)	35 percent
Total pozzolan/cementitious material replacement	50 percent

Commented [TC7]: Limits based on industry recommendations. Table expands on our previous limits to address new available pozzolans.

Cast-in-place concrete shall contain no more than 635 lbs./yd³ of cement and not more than 660 lbs./yd³ of cementitious material. Pozzolans are included as cementitious material.

Class S concrete shall contain a minimum of 650 lbs./ yd³ of cementitious material.

All concrete mixes must be designed in accordance with the criteria of this Section. The design proportions with the fine aggregates designated as a percent of the total aggregate must be stated in terms of aggregates in a saturated, surface dry condition and the batch weights will be adjusted by the Contractor for the actual moisture of the aggregate at the time of use.

Self-consolidating concrete (SCC) may be used for Class A, LP or P mixes when approved by the Resident. SCC shall meet the requirements for strength, entrained air and permeability for the respective concrete Class. SCC shall be tested for slump flow in accordance with ASTM C1611; the visual stability index (VSI) shall be 0 or 1.

No change in the source, proportions or character of the mix ingredients may be made without notice to the Department and no new mix ingredients shall be used until the Department has approved such ingredients and new mix proportions, if they change. The Contractor shall notify the Resident of any changes to the coarse aggregate blend prior to supplying concrete to the project."

502.06 Batching Replace paragraph one, "measuring and batching..." with the following:

"Measuring and batching of materials for Structural Concrete shall be performed at an approved batching plant. The plant shall meet the requirements of AASHTO M 157. Batching plants will be inspected annually for approval by either the Department or by the National Ready Mixed Concrete Association."

Replace subsection 2. "Pozzolanic Additives..." with the following:

“2. Pozzolanic Additives, including Coal Ash, natural pozzolans, Slag Cement, and Silica Fume”

502.08 Cold Weather Concrete Replace Table 2, “Cold Weather Temperature Table” with the following:

Table 2

Commented [TC8]: Cleaned up table titles.

Cold Weather Temperature Table			
<12 inches	12 to 36 inches	36 to 72 inches	>72 inches
60°F	55°F	45°F	40°F
Minimum Concrete Temperature as Placed			

502.09 Forms and False work Replace subsection A., paragraph twelve “In the construction of forms...” with the following:

“In the construction of forms and false work for the portion of superstructure slabs overhanging the exterior members of beam and girder spans, forms and supporting devices resulting in point loadings on the exterior members shall not be used. Loads resulting from supporting devices shall be distributed directly to the flanges by means of brackets or braces. No welding will be permitted to attach form supports of any type to the superstructure, unless approved by the Fabrication Engineer. Where shear connector studs are available, welding to the studs will be permitted.”

502.10 Placing Concrete Replace subsection A., paragraph two “All concrete shall be placed...” with the following:

“All concrete shall be placed before it shows signs of accelerated hydration gain and, in any case, as specified in Section 502.07. Concrete shall be placed in horizontal layers in such a manner as to avoid separation and segregation. Enough workers for the proper handling, tamping and operation of vibrators shall be provided to compact each layer before the succeeding layer is placed and to prevent the formation of cold joints between layers. Concrete shall not be placed against any surface coated with curing compound unless the curing compound has been removed. Care shall be taken to prevent mortar from spattering on structural steel, reinforcing steel and forms. Any concrete or mortar that becomes dried on the structural steel, reinforcing steel or forms shall be thoroughly cleaned off before the final covering with concrete. Following the placing of the concrete, all exposed surfaces shall be thoroughly cleaned as required, with care not to injure any surfaces.”

Replace subsection B., paragraph two “Dropping the concrete...” with the following:

“Dropping the concrete from a distance of greater than 6 feet, unless confined by closed chutes or pipe, will not be permitted. The concrete shall be deposited at, or as near as possible to, its final position.”

502.13 Finishing Concrete Surfaces Replace paragraph one “Neat cement past, dry...” with the following:

“Neat cement paste, dry cement powder or the use of mortar for topping or plastering of concrete surfaces will not be permitted. Use of evaporation retardants, finishing aids, or water, to finish any concrete surfaces shall not be allowed.”

Replace subsection B., paragraph one "Structural Concrete Slab Structures..." with the following:

"Structural Concrete Slab Structures: Structural concrete slab structures include, but are not limited to, structural concrete deck slabs, wearing surfaces, slabs on precast superstructures, top and bottom slabs of box culverts, approach slabs, rigid frame structures and simple slab spans, as applicable. Screed rails shall be set entirely above the finished surface of the concrete and shall be supported in a manner approved by the Resident. Additional shear studs may be welded to the top flange to be used for screed rail support in locations that do not conflict with the location of the designed shear stud locations."

Add a new paragraph to subsection E. Surface Finish, after paragraph one "After the concrete has...":

"The straightedge shall be furnished and maintained by the Contractor. It shall be fitted with a handle and all parts shall be made of aluminum or other lightweight metal. The straightedges shall be made available for use by the Resident when requested."

Commented [TC9]: Accidentally removed from 2020 specification.

502.14 Curing Concrete Replace this section with the following:

"All concrete surfaces shall be kept wet with clean, fresh, water for a curing period of at least 7 days after concrete placing, with the exception of vertical surfaces, as provided for in Section 502.09(D) - Removal of Forms and False work, and sidewalks, as provided for in this section. For concrete wearing surfaces and all concrete containing coal ash and slag cement, the temperature of the concrete shall be kept above 50°F for the entire seven (7) day period. All other concrete and its surfaces shall be kept above 50°F for the first four (4) days of the curing period and above 32°F for the remainder of the period.

"In the 24 hours following the end of the curing period, the temperature of the concrete shall be decreased on a gradual basis, not to exceed a total change of 40°F for moderate sections, such as abutments and pier bents, and 30°F for mass sections, such as massive piers.

All slabs and wearing surfaces shall be water cured and continuously wet for the entire curing period by covering with one of the following systems:

Commented [TC10]: Accidentally removed from 2020 specification.

- A. 2 layers of wet burlap
- B. 2 layers of wet cotton mats
- C. 1 layer of wet burlap and either a polyethylene sheet or a polyethylene coated burlap blanket
- D. 1 layer of wet cotton mats and either a polyethylene sheet or a polyethylene coated burlap blanket.

Except as otherwise specified, curing protection for slabs and wearing surfaces shall be applied within 15 minutes after the concrete is screeded and before the surface of the concrete has lost its surface "wetness" or "sheen" appearance. The burlap or the cotton mats shall be pre-soaked, prior to being applied. Polyethylene sheets shall not be placed directly on the concrete, but may be placed over the fabric cover to prevent drying.

The covering of concrete wearing surfaces, decks, curbs, and sidewalks shall be kept continuously wet for the entire curing period using a continuous wetting system and shall be located to ensure a completely wet concrete surface for the entire curing period, except as noted below.

The finished surfaces of sidewalks may be cured using a curing compound listed on the Department's Qualified Products List. The curing compound shall be applied continuously by approved mechanical pressure spraying or distributing equipment at a rate necessary to obtain an even, continuous membrane, meeting the manufacturer's recommendations, but at a rate of not less than 1 gallon per 200 ft² of surface. At a minimum, two coats shall be applied using a pressurized sprayer, with the first coat being applied within 15 minutes after finishing is complete, and the second coat being applied within 30 minutes of, and at right angles to, the first. Hand-pump sprayers, rollers or brushes shall not be used.

All other surfaces, if not protected by forms, shall be kept thoroughly wet either by sprinkling or using wet burlap, cotton mats or other suitable fabric until the end of the curing period, except as provided for in Section 502.09(D) - Removal of Forms and False work. Polyethylene sheets shall not be placed directly on the concrete, but may be placed over the fabric cover to prevent drying.

502.1701 Quality Control, Method A and B Replace subsection G. "Initial and as-Delivered..." with the following:

"G. Initial and as-Delivered Mix Properties, including Temperature, Air Content, Consistency and Water/Cementitious Material Ratio"

Replace subsection A. "QCP Administrator", subsection 2. "Engineer-in-Training..." with the following:

"2. Engineer Intern certified by the State of Maine with two years of concrete experience acceptable to the Department."

502.1703 Acceptance Methods A and B Replace paragraph eight "Compressive strength test will..." with the following:

"Compressive strength tests will be completed by the Department in accordance with AASHTO T 22 and T 23 at ≥ 56 days, except that no slump will be taken. Three 4-inch x 8-inch cylinders will be cast per subplot placed. The average of two concrete cylinders per subplot will constitute a test result and this average will be used to determine the compressive strength for pay adjustment computations."

Commented [TC11]: Consistency with change to 56 day QA breaks.

Commented [TC12]: 3 cylinders allows a backup cylinder if our breaks are not within 10% of each other.

Replace paragraph nine "Testing for Entrained Air..." with the following:

"Testing for Entrained Air in concrete, at the rate of one test per subplot, shall be in accordance with AASHTO T 152."

Replace paragraph ten "Surface Resistivity specimens will be..." with the following:

"Surface Resistivity specimens will be tested by the Department in accordance with AASHTO T 358 at an age ≥ 56 days. Three 4-inch x 8-inch cylinders will be cast per subplot

placed. The average of three concrete specimens per subplot will constitute a test result and this average will be used to determine the permeability for pay adjustment computations."

502.1707 Resolution of Disputed Acceptance Test Results Replace subsection A. "Compressive Strength" paragraph one "There may be cases..." with the following:

"There may be cases where the Department's test results indicate that concrete must be removed and replaced, or that the material is marginally acceptable and may remain in place and paid for at a reduced rate. In these cases, and providing that the Contractor's QC test results from a NETTCP certified laboratory for the same load are more than 500 psi higher than that of the Department's test results, the following procedure concerning compressive strength may be undertaken by the Contractor and witnessed by the Department, within 64 days of the placement date:"

Replace subsection A. "Compressive Strength", subsection 1. "Drilled core specimens shall..." with the following:

1. "Drilled core specimens shall be retrieved from the concrete in question in accordance with the requirements of ASTM C42, Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete. The core strength acceptance and evaluation criteria included in ACI 318 shall not apply."

Replace subsection B. "Permeability", subsection 1. "Drilled core specimens shall..." with the following:

1. "Drilled core specimens shall be retrieved from the concrete in question in accordance with the requirements of ASTM C42, Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete. Specimens shall have a diameter of 4 inches and a minimum length of 8 inches."

Replace subsection B. "Permeability", subsection 4. "The cored cylinders will..." with the following:

4. "The cored cylinders will be tested by the Department in accordance with AASHTO T 358. The resulting permeability value shall be used by the Department in the final determination of the acceptability of the material in question and shall replace the contested test result in computing pay adjustments for the Lot in question."

SECTION 526
CONCRETE BARRIER

Commented [TC13]: This Section is already a full repair spec. Updating to address 712.061-534 change.

526.02 Materials Replace subsection a. "Concrete" with the following:

- a. ~~"Concrete"~~ Concrete for barriers, both permanent and portable, shall have a design strength of 5,000 psi.

For cast-in-place barrier: The concrete shall be Class LP, in accordance with Standard Specification Section 502, Structural Concrete.

For precast barrier: The concrete shall meet the requirements of Standard Specification 534, Precast Structural Concrete, except the stripping strength for precast barriers is 4,000 psi. Concrete shall be Class P1.

SECTION 534
PRECAST STRUCTURAL CONCRETE

Commented [TC14]: Request was made to remove construction requirements from 712.061 to 534. After review, pretty much all of 712.061 was construction related.

Amend this section by deleting it in its entirety and replacing it with:

534.01 Description The Contractor shall design, manufacture, furnish, and install precast structural concrete arches, box culverts or three sided frames and associated wingwalls, headwalls, toe walls, cut-off walls and appurtenances, in accordance with the Contract Documents.

Other structural precast concrete units shall conform to the dimensions shown on the Plans, the requirements of this Specification and with the reviewed Working Drawings.

534.02 Materials Structural precast elements shall meet the requirements of the following Standard Specification Subsections, except as noted otherwise in this specification:

Commented [TC15]: 712.061 previously spelled out a lot of material requirements. Referencing applicable 700 sections is more appropriate in my opinion.

Portland Cement and Blended Hydraulic Cement	701.01
Water	701.02
Air Entraining Admixtures	701.03
Water Reducing Admixtures	701.04
High Range, Water Reducing, Admixture	701.0401
Set-retarding Admixtures	701.05
Accelerating, Chemical Admixtures	701.0501
Curing Materials	701.06
Coal Ash and Natural Pozzolans	701.10
Calcium Nitrite Solution	701.11
Silica Fume	701.12
Slag Cement	701.13
Fine Aggregate for Concrete	703.01
Coarse Aggregate for Concrete	703.02
Alkali Silica Reactive Aggregates	703.0201
Combined Aggregate Grading for Concrete	703.03
Preformed Expansion Joint Filler	705.01
Reinforcing Steel	709.01
Welded Steel Wire Fabric	709.02

Materials for concrete shall conform to Table 1 below. Concrete mix designs shall be submitted for review and approval by the Fabrication Engineer prior to use. The Class of concrete shall be P1, unless specified different.

Table 1

Concrete CLASS	Compressive Strength (psi)	Entrained Air (%)		W/C Ratio	Calcium Nitrite Solution (gallons/cubic yard)	Notes
		LSL	USL			
P1	5,000	5.0	8.0	0.40	3.0	1,2,3,4
P2	5,000	5.0	8.0	0.40	5.5	1,2,3,4
P3	4,600	5.0	8.0	0.42	N/A*	1,2,3,4

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*3 gallons/cubic yard if steel used

- Note #1 When required, permeability testing for all concrete mixes will be done at 56 days.
- Note #2 Compressive Strength testing for all concrete mixes will be done at 28 days.
- Note #3 Table limits shall be followed unless otherwise stated in the Contract
- Note #4 Coarse Aggregate for concrete shall conform to Grading A, AA or SP-1-7.

Commented [TC16]: Precast mix designs commonly use high early cements and are closer to max potential at 28 days than CIP concrete.

For calculating water cementitious ratios, one U.S. gallon of water shall be considered to weigh 8.34 pounds.

New concrete mix designs and mix designs not previously approved by the Fabrication Engineer shall be qualified by trial batches prepared in accordance with AASHTO T 126 (ASTM C192). The test results shall demonstrate that the concrete meets the requirements of the Contract Documents.

Only one mat of steel is required for concrete member thickness of seven inches or less; two mats of steel, one at each face, are required for concrete member thickness greater than seven inches.

Grout materials, rapid setting concrete patching materials, and geotextiles shall be one of the products listed on the Department's Qualified Products List (QPL)

All precast members for a distinct system or Contract Pay Item, including end blocks, steps, caps, box culverts, arch sections, wall units, or other elements, shall be manufactured from the same material sources of aggregates, brand and type of cement and color pigment.

Bedding and backfill material for structural precast arch, box culvert, or three sided frame and associated precast elements shall conform to the requirements of Standard Specification 703.19, Granular Borrow, Material for Underwater Backfill, with the additional requirement that the maximum particle size shall be limited to 4 inches, or as shown on the Plans.

534.03 Drawings Prepare shop detail, erection and other necessary Working Drawings in accordance with Standard Specification Section 105.7, Working Drawings. The Department will review the drawings in accordance with the applicable requirements of Section 105.7, Working Drawings. Changes and revisions to the reviewed Working Drawings shall require further review by the Fabrication Engineer. Working Drawings shall include the following minimum details:

1. Fully dimensioned views showing the geometry of the units, including all projections, recesses, notches, openings, block outs, keyways and chamfers.
2. Details and bending schedules of reinforcing steel including the size, spacing, and location. Reinforcing provided under lifting devices shall be shown in detail.
3. Details and locations of all items to be embedded.
4. Total weight of each unit.

Concrete mix designs shall be part of the Working Drawing submittal. Include aggregate specific gravity, absorption, percent fracture, fineness modulus and gradation as part of the mix design. Provide the mix design calculations demonstrating how the batch weights, water-cement ratio and admixture dosage rate were determined.

534.04 Design Requirements The following specification is only required for precast structural concrete arches, box culverts, or three sided frames and associated wingwalls, headwalls, toe walls, cutt-off walls and appurtenances.

Commented [TC17]: Not all items previously referencing 712.061 require the contractor to design the precast item.

The Contractor shall design in accordance with the AASHTO LRFD Bridge Design Specifications, latest edition. The HL-93 live load specified in the AASHTO LRFD Bridge Design Specifications shall be used for all limit states, except for Strength I. The live load used for the Strength I limit state shall be the Maine Modified live load, which consists of the standard HL-93 Live Load with a 25 percent increase in the Design Truck only. (Wheel loads based on the Design Truck shall be increased 25 percent). Additionally, if the governing load rating factor based on the HL-93 live load is equal to or less than 1.10 and the span is 14 feet, or greater, then a load rating based on the Maine legal truck (Configuration #6) shall also be checked to insure the rating factor is equal to, or greater than, 1.0.

The live load deflection check, per AASHTO LRFD Bridge Design Specifications, for the top slab of box culverts and frames with clear spans of 15 feet, or greater, and cover depths of 4 feet, or less, is mandatory. The live load deflection check shall be documented in the design computations submittal.

Design calculations that consist of computer program generated output shall be supplemented with at least one hand calculation and graphics demonstrating the design methodology used. The hand calculation shall document, at a minimum, the Strength I load case flexural design check of the top slab positive moment reinforcing steel. Design calculations shall provide thorough documentation of the sources of equations used and material properties.

The design shall be load rated in accordance with the AASHTO Manual for Bridge Evaluation, latest edition, by the LRFR method and in accordance with the Department Load Rating Guide.

The Contractor shall submit design calculations and load rating, if applicable, for the precast structure to the Department for review. A Professional Engineer, licensed in accordance with State of Maine laws, shall sign and seal all design calculations and drawings.

The Contractor shall submit the following items for review by the Department, at least forty-five Working Days prior to production:

- A. The name and location of the manufacturer
- B. Method of manufacture and material certificates
- C. Description of method of handling, storing, transporting, and erecting the units
- D. Design computations (bound and indexed)
- E. Load rating computations and completed load rating form (bound and indexed)

534.05 Facilities for Inspection The Contractor shall provide a private office at the fabrication plant for the Department's inspection personnel, or Quality Assurance Inspectors (QAI), in accordance with Standard Specification Section 535.05, Facilities for Inspection.

Failure to comply with the above requirements will be considered denial of access to the Work for the purpose of inspection. The Department will reject all Work done when access for inspection is denied.

534.0501 Fabrication Facility The precast units shall be manufactured at a facility that has a minimum of five years of experience in producing similar type products. The plant shall meet the requirements of AASHTO M 157 or hold an active certification with Precast/Prestressed Concrete Institute (PCI) or the National Precast Concrete Association (NPCA). Facilities certified by NPCA or PCI shall provide the Fabrication Engineer with a copy of their annual audit to include deficiency reports and corrective actions.

Commented [TC18]: New section, mostly copied from current 712.061 language.

The Contractor shall calibrate all production equipment per Table 2 below, unless there is a reason to believe calibration should be performed sooner.

Table 2

Production Equipment	Minimum Frequency of Calibration (every)
Water Gauge(s)	90 days
Admixture Dispenser(s)	90 days
Batch Plant Scale(s)	6 months
Concrete Cylinder Compression Testing Machine	1 year

Use proving rings, load cells and solid standard weights, as applicable. The calibration shall be performed by a testing laboratory acceptable to the Department, using calibration equipment the accuracy of which is traceable to a National Institute of Standards and Technology (NIST) standard. Provide calibration certifications to the QAI prior to beginning fabrication.

534.06 Notice of Beginning Work The Contractor shall notify the Department of the planned start of production date of the precast units a minimum of two weeks prior to beginning production for in-Maine work and a minimum of three weeks prior to beginning production for out-of-Maine work. If the production schedule changes, notify the Fabrication Engineer no less than three Working Days prior to the initial production start-up date. Any Work done without the QAI present will be rejected. Advise the Fabrication Engineer of the production schedule and any changes to it. If Work is suspended on a project, the Fabrication Engineer will require 72 hours of notice prior to the resumption of Work.

534.07 Quality Control Quality Control (QC) is the responsibility of the Contractor. The Quality Control Inspection (QCI) shall inspect all aspects of the work.

QC staff shall be separate from production and shall not perform any production work.

Commented [TC19]: Coy has been adding this language to 534 projects since 2019 as a SP. Recommend making it a repair spec.

Provide a copy of the Quality System Manual (QSM) to the Fabrication Engineer for review and approval.

Commented [TC20]: Coy has been adding this language to 534 projects since 2019 as a SP. Recommend making it a repair spec.

Inspect all aspects of the Work in accordance with the Contractor's QSM. Reject materials and workmanship that do not meet Contract requirements.

Record measurements and test results on the appropriate forms from **APPENDIX C** of PCI Manual for Quality Control for Plants and Production of Structural Precast Concrete Products

Commented [TC21]: Location changed with latest MNL 116 update

(MNL 116), or an equivalent form prepared by the user. Provide copies of measurements and test results to the QAI as follows:

Type of Report	When Provided to QAI*
Aggregate gradations-fine aggregate and coarse aggregate	Prior to beginning work and at least once a week thereafter
Material certifications /calibration certifications	Prior to beginning work (anticipate adequate time for review by QAI)
Pre-placement inspection report	Prior to the concrete placement
Concrete batch slips	The morning of the next work day
Results of concrete testing	The morning of the next work day
Concrete temperature records	Provide with compressive strength testing
Nonconformance reports/repair procedures	Within 24 hours of discovery
Results of compressive strength testing (for design strength)	Prior to stopping curing / Prior to final acceptance
Post-placement inspection report	Prior to final acceptance

* The Contractor and QAI may, by mutual agreement, modify any part of the schedule; however, failure to provide the documentation when required by the Fabrication Engineer will result in the product being deemed unacceptable. The Contractor may perform testing in addition to the minimum required. The results of all testing shall be made available to the Department.

534.08 Quality Assurance Quality Assurance (QA) and acceptance is the prerogative of the Department.

The Department will conduct QA in accordance with Standard Specification Subsection 106.5. Testing deemed necessary by the Department that is in addition to the minimum testing requirements, will be scheduled to minimize interference with the production schedule. The QAI will perform acceptance sampling and testing and will witness or review documentation, workmanship and testing to assure the Work is being performed in accordance with the Contract Documents.

534.09 Nonconforming Work The Contractor shall generate a nonconformance report (NCR) for materials and/or workmanship that is nonconforming. The NCR shall describe the nonconformance and the proposed corrective action. Copies of the NCR shall be provided to the Department's QAI and the Fabrication Engineer for review. Nonconforming material and/or workmanship shall be corrected or replaced.

If an item fabricated under this Specification does not meet the Contract requirements but is deemed suitable for use by the Department, it may be accepted in accordance with Section 106.8, Non-Conforming Work, of the Standard Specifications.

The QAI has the authority to reject materials and products that do not meet the Contract requirements, including Work rejected due to denial of access or the lack of adequate notice of the beginning of production. The acceptance of material or workmanship by the QAI will not prevent subsequent rejection, if the Work is later found to be unacceptable.

534.10 Forms Construct forms in accordance with the Working Drawings. Forms shall be sufficiently rigid and accurate to maintain the member's dimensions. The forms shall be well constructed, substantial and unyielding, securely braced, and sufficiently tight to prevent leakage of mortar. Reject forms that do not maintain the dimensions shown on the Working Drawings.

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Corners within the forms shall be fitted with consistent width chamfer strips of 5/8 inch $\pm$ 1/8 inch mitered at their intersections; all exposed corners shall be chamfered.

Seal wooden forms to prevent absorption of water. Apply and cure the sealer in accordance with the manufacturer's product data sheet.

Apply a non-staining bond-breaking compound to the forms in accordance with the manufacturer's product data sheet. Solvent clean reinforcing steel and welded steel wire fabric contaminated with the bond-breaking compound. Forms shall be clean and free of foreign material prior to placing concrete.

534.11 Reinforcing Steel and Welded Steel Wire Fabric Reinforcing steel shall be fabricated, handled, and placed in accordance with Standard Specification Section 503, and the reviewed Working Drawings.

The concrete cover over the outside circumferential reinforcement shall be two inches, minimum, and the concrete cover over the inside reinforcement shall be one and a half inches, minimum. The clear distance of the end of circumferential wires shall not be less than one inch or more than two inches from the end of the units. Use sufficient supports and spacers to maintain the minimum concrete cover. The supports and spacers shall be made of a dielectric material or other material approved by the Fabrication Engineer.

Welded steel wire fabric shall meet the spacing requirements and contain sufficient longitudinal wires extending through the unit to maintain the shape and position of the reinforcement. Longitudinal distribution reinforcement may be welded steel wire fabric or deformed steel bars which meet the spacing requirements. The ends of the longitudinal distribution reinforcement shall not be more than three inches from the ends of the units.

Do not use more than three layers of reinforcing to form a single mat. If reinforcing steel is cut to install lifting devices, install additional reinforcing adjacent to the cut steel, as shown on the Working Drawings.

Tension splices in the reinforcement will not be permitted. For splices other than tension splices, the overlap shall be a minimum of 12 inches for welded steel wire fabric and as specified in Standard Specification Section 503 for deformed steel bars. The center-to-center wire spacing in wire fabric sheets shall not be less than two inches, or more than four inches, for the circumferential wires, and shall not be more than eight inches for the longitudinal wires. The center-to-center spacing of the longitudinal distribution steel for either line of reinforcing in the top slab shall not be more than 15 inches.

534.12 Inserts Recess metal inserts and form ties a minimum of one inch, unless noted otherwise in the Contract. The QAI is not responsible for verifying the location of inserts or other hardware installed for the convenience of the Contractor.

534.13 Concrete Placement Do not batch or place concrete until all the form(s) for any continuous placement have been inspected and accepted by the QCI, and the QAI concurs.

Test concrete in accordance with Standard Specification Section 534.14.

Test the first two loads of concrete for temperature, air entrainment and slump flow for Self-Consolidating Concrete (SCC). If the first load is unacceptable, test the second load as the first. Continue this process until two consecutive loads are acceptable. After two consecutive loads are acceptable, the frequency of testing shall be at the discretion of the QAI.

If there is a change in the dosage rate of any admixture or a change of more than 5° F in mix temperature, then test the concrete for temperature, air entrainment and slump flow for SCC.

Test every load of one cubic yard, or less, from a stationary mixer or two cubic yards, or less, from a transit mixer for temperature, air entrainment and slump flow for SCC, prior to placing the concrete in the forms.

Perform all testing in the presence of the QAI. The QAI will designate the loads to be tested. Make cylinders used to determine stripping strength during the last 1/3 of the placement.

Place the concrete as nearly as possible to its final location. Control the depth of each lift in order to minimize entrapped air voids. The maximum depth of an unconsolidated lift shall be 18 inches. Vibrate the concrete with internal or internal and external vibrators. Do not use external vibrators, only. Insert internal vibrators vertically and penetrate the lower layer of concrete by at least four inches. Insert the vibrators in the concrete to assure that the radii of action of the vibrators overlap. Hold the vibrators in position from 5 to 15 seconds; vibration time shall be reduced by 50 percent when placing SCC. Do not use vibrators to move concrete horizontally. Each lift of concrete shall have sufficient plasticity to be consolidated with subsequent lifts.

Do not re-temper the concrete with water after discharging has begun. The Contractor may add High Range, Water Reducing, admixture to the concrete after batching if that practice conforms to the manufacturer's product data sheet. Discard concrete that becomes unworkable.

Do not use water or water-based products to aid in finishing fresh concrete.

After the concrete has been placed and finished and before the forms are covered, remove all concrete from projecting reinforcing steel.

534.1301 Curing The units shall be cured by one of the following methods:

1. Curing by Moisture Retention: Cure the concrete in accordance with the latest edition of MNL 116, Section 4.9. Moist cure the concrete until it has reached design strength.

Do not use membrane-forming curing compounds without the approval of the Fabrication Engineer. If membrane-forming curing compounds are authorized, follow the requirements of MNL 116 and the curing compound manufacturer's published recommendations.

2. Accelerated Curing of Concrete: Cure the concrete in accordance with MNL 116, Section 4.9, except as modified herein.

Initial set shall be determined in accordance with ASTM C403. A strength gain of 500 psi indicates initial set. The maximum allowable concrete temperature shall be 160°F.

Commented [TC22]: New section, mostly copied current 712.061 language.

Commented [TC23]: Temperature gain requirement of max 40F/hr is already an industry requirement in MNL 116-21

Concrete temperature shall be measured during curing with recording thermometers. In order to qualify for accelerated cure, the concrete temperature shall attain a minimum temperature of 120°F; that temperature shall be maintained for a minimum of 8 hours and the concrete shall achieve a minimum of 80 percent of design strength.

The accelerated curing cycle shall be considered complete when the method of supplying heat is stopped and/or the concrete temperature drops below 120°F. Two cylinders shall be tested immediately upon completion of the accelerated cure cycle. Products that have not achieved all of the above criteria shall be moist cured until the concrete has achieved design strength.

If the precast units have achieved 80 percent of design strength during the accelerated curing cycle, no further curing will be required.

The forms shall remain in place until the concrete attains a minimum compressive strength of 3,000 psi.

534.14 Acceptance and Quality Control Testing of Concrete Acceptance of structural precast units, for each day's production, will be determined by the Department, based on compliance with this specification and satisfactory concrete testing results.

At least once per week, the QAI will make three concrete cylinders (six cylinders when the Contract includes permeability requirements) for use by the Department; cylinders shall be standard cured in accordance with AASHTO T 23 (ASTM C31). The QAI will perform entrained air content and slump flow testing, determine water-cement ratio and determine temperature of the sampled concrete at the time of cylinder casting. All testing equipment required by the QAI to perform this testing shall be in accordance with Standard Specification Section 502.041, Testing Equipment. In addition, the Contractor shall provide a slump cone meeting the requirements of AASHTO T 119. Providing and maintaining testing and curing equipment shall be considered incidental to the work and no additional payment will be made.

Quality Control test cylinders shall be made and tested in accordance with the following standards:

AASHTO T 22 (ASTM C39)	Test Method for Compressive Strength of Cylindrical Concrete Specimens
AASHTO T 23 (ASTM C31)	Practice for Making and Curing Concrete Test Specimens in Field
AASHTO T 141 (ASTM C172)	Practice for Sampling Freshly Mixed Concrete
AASHTO T 152 (ASTM C231)	Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
AASHTO T 196 (ASTM C173)	Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method
ASTM C1064	Test Method for Temperature of Freshly mixed Portland Cement Concrete
ASTM C1611	Standard Test Method for Slump Flow of Self-Consolidating Concrete

Tested concrete shall conform to the following:

A. Temperature shall be from 40°F to 85°F.

- B. Slump flow shall be homogenous with no sign of segregation.
- C. Visual stability index (VSI) of SCC shall not exceed 1; if a mortar paste halo is present it shall not exceed an average of 0.25 inch.

The Contractor shall cast a minimum of 8 concrete test cylinders for each continuous concrete placement, for QC purposes: 2 cylinders shall be standard cured in accordance with AASHTO T 23 (ASTM C31) to be tested for 28 day strength; and a minimum of 6 cylinders shall be field cured under the same conditions as the units and tested for stripping and design strength. Unit identification, entrained air content, water-cement ratio, slump flow and temperature of the sampled concrete shall be recorded at the time of cylinder casting. The Contractor shall perform all testing in the presence of the QAI. The QAI will designate the loads to be tested.

If the Contractor fails to make enough cylinders to demonstrate that the product meets the Contract requirements, the product will be considered unacceptable.

The compressive strength of the concrete will be determined by averaging the compressive strength of two test cylinders made from the same sample. For determining design strength, the average of two cylinders shall meet or exceed the design strength, and the difference in strength between the two shall be no more than 10 percent of the higher strength cylinder.

Perform compressive strength testing to determine stripping and design strength in the presence of the QAI. Cylinder tests not witnessed by the QAI will not be acceptable.

All QC Inspectors performing concrete testing shall hold a current ACI Field Testing Technician Grade I Certification, or other equivalent certification.

534.15 Manufacture of Precast Units The units shall be free of fractures. The ends of the units shall be normal to the walls and centerline of the unit, within the limits of variation provided, except where beveled ends are specified. The surfaces of the units shall be a smooth steel form or troweled surface finish, unless a form liner is specified. The ends and interior of the assembled structure shall make a continuous line of units with a smooth interior surface.

Defects which may cause rejection of precast units include, but are not limited to, the following:

- A. Any discontinuity (crack, rock pocket, etc.) of the concrete which could allow moisture to reach the reinforcing steel.
- B. Rock pockets or honeycomb over 6 square inches in area or over 1 inch deep.
- C. Edge or corner breakage exceeding 12 inches in length or 1 inch in depth.
- D. Any other defect that clearly and substantially impacts the quality, durability, or maintainability of the structure, as determined by the Fabrication Engineer.

The manufacturer of the units shall sequentially number and shop fit each adjacent unit to ensure that they fit together in the field. This fit up shall be witnessed by the QAI. Any non-fitting units shall be corrected or replaced at no cost to the Department.

The manufacturer of the units shall keep accurate records of aggregate gradations, concrete batching, testing, curing, and inspection activities to verify that forms, reinforcing and

unit dimensions conform to these requirements. Copies of reports shall be furnished to the Department.

534.16 Tolerances Dimensional tolerances shall be in conformance with the following:

- A. The internal dimensions shall not vary by more than 1 percent from the design dimensions or 1-½ inches, whichever is less, with the exception of the cross diagonal dimension which shall not vary by more than one-half inch from the design dimension.
- B. The haunch dimensions shall not vary by more than three-quarters inch from the design dimension.
- C. The dimension of the legs shall not vary by more than one-quarter inch from the dimension shown on the reviewed Working Drawings.
- D. The slab and wall thickness shall not be less than the design thickness by more than one-quarter inch. A thickness greater than the design thickness shall not be cause for rejection.
- E. Variations in laying lengths of two opposite surfaces shall not be more than five-eighths inch in any unit, except where beveled ends for laying of curves are specified.
- F. The under-run in length of any unit shall not be more than one-half inch.

534.17 Finishing Concrete Products shall be finished to meet the Standard Grade finish as described in the MNL-116. Units, or portions of units, that will be exposed to view in their final location shall receive a rubbed precast finish. See the requirements of each finish type below.

1. Rubbed Precast Finish: The Contractor may propose an alternate procedure to achieve a rubbed precast finish for review by the Fabrication Engineer. If an alternate procedure is not submitted, the following procedure shall be followed.

After removal of forms, the rubbing of concrete shall be started as soon as its condition will permit. Immediately before starting this work, the concrete shall be thoroughly saturated with water. Sufficient time shall have elapsed before wetting down to allow the mortar used in ordinary finish to become thoroughly set. Surfaces to be finished shall be rubbed with a medium coarse carborundum stone, using a small amount of mortar on its face. The mortar shall be composed of cement and fine sand mixed in proportions as used in the concrete being finished. Rubbing shall continue until all form marks, projections and irregularities have been removed, all voids filled and a uniform surface has been obtained. A thin layer of paste produced by this rubbing shall be left on the surfaces.

After all concrete above the surface being treated has been cast, the final finish shall be obtained by a second rubbing with a fine carborundum stone using only water. This rubbing shall be continued until the entire surface is of a smooth texture and uniform color. The paste produced by this second rubbing shall be carefully spread with a moist whitewash brush to form a very thin uniform coating upon the surface of the concrete.

After the final rubbing is completed and the surface has dried, it shall be rubbed lightly with clean, dry, burlap to remove excess loose powder and shall be left free from all unsound patches, paste, powder and objectionable marks. This finish shall result in a surface of smooth texture and uniform color.

Commented [TC24]: The first sentence has been going in as a SP since 2019 via Coy. Recommend making it a repair specification.

Commented [TC25]: 712.061 currently references CIP finish specifications, although there is lots of overlap, I thought there may be benefits to having precast specific finishing requirements.

Marking: The date of manufacture, production lot number, and type of unit shall be clearly and indelibly inscribed on a rear, unexposed portion of each unit.

534.18 Repairing Defects Defects requiring repair will be considered either non-structural or structural.

Non-Structural Defects: Exposed surfaces shall be of uniform appearance; only minor repairs to remove and blend fins, patch minor spalls and to repair small, entrapped air pockets, shall be permitted. Repair honeycombing, ragged or irregular edges and other non-structural or cosmetic defects using a patching material from the Department Qualified Products List (QPL). The repair, including preparation of the repair area, mixing and application and curing of the patching material, shall be in accordance with the manufacturer's product data sheet. Corners not exposed in the final product may be ground smooth with no further repair necessary, if the depth of the defect does not exceed one-half inch. Remove form ties and other hardware to a depth of not less than one inch from the face of the concrete and patch the holes using a patching material from the Department QPL.

Structural Defects: Repair structural defects only with the approval of the Fabrication Engineer. Submit a nonconformance report (NCR) to the Fabrication Engineer with a proposed repair procedure. Do not perform structural repairs without an NCR that has been reviewed by the Fabrication Engineer. Structural defects include, but are not limited to, exposed reinforcing steel, cracks in bearing areas, through cracks and cracks 0.013 inch in width that extend more than 12 inches in length in any direction. Give the QAI adequate notice prior to beginning any structural repairs.

534.19 Handling, Storage and Transportation Handle, store and transport units in a manner as to eliminate the danger of chipping, cracks, fracture, and excessive bending stresses. Any units found damaged upon delivery, or damaged after delivery, shall be subject to rejection.

Do not place precast units in an upright position until a compressive strength of at least 4,000 psi is attained. Precast units may be handled and moved, but not transported, until the 28 day design strength has been attained.

Support stored precast units above the ground on dunnage in a manner to prevent twisting or distortion. Protect the units from discoloration and damage.

Set precast units on one-half inch thick neoprene pads during shipment to prevent damage to the unit legs. The Contractor shall repair any damage to precast units resulting from shipping or handling; this shall be accomplished by saw cutting a minimum of one-half inch deep around the perimeter of the damaged area, removing any loose concrete out to the saw cut perimeter and installing a polymer-modified cementitious patching material, from the Department's QPL, per the manufacturer's product data sheet.

534.20 Installation of Precast Units When footings are required, install the precast units on concrete footings that have reached a minimum compressive strength of 3,000 psi. Construct the completed footing surface to the lines and grades shown on the Plans. When checked with a 10 foot straightedge, the surface shall not vary more than one-quarter inch in 10 feet. The footing keyway shall be filled with a Department-approved non-shrink flowable cementitious grout with a minimum design compressive strength of 5,000 psi at 28 days, unless otherwise specified in the Contract.

Three sided frame and box culvert joints shall be sealed with a Department-approved flexible joint sealant in accordance with ASTM C990. Joints shall be closed tight. Culvert units shall be equipped with joint closure mechanisms to draw units together and close joints to the required opening.

Completely fill the exterior face of joints between precast units with a material from the Department QPL and cover with a minimum 12 inch wide joint wrap. Additionally, for box culverts and three sided frames, cover the entire top surface with waterproofing membrane; waterproofing membrane shall extend one foot from the top down the sides of the units. The surfaces shall be free of dirt and deleterious materials before applying the filler material and joint wrap. Install the external wrap in one continuous piece over each unit joint, taking care to keep the joint wrap in place during backfilling.

Seal the back of joints between the end unit and attached elements with a non-woven geotextile. Install and tighten the bolts fastening the connection plate(s) between the elements that are designed to be fastened together as designated by the manufacturer.

Fill holes that were cast in the units for handling with either Portland cement mortar or with precast plugs secured with Portland cement mortar or other approved adhesive.

Place and compact the bedding material as shown on the Plans prior to lifting and setting the culvert units. Backfilling of the structure shall be done in accordance with the manufacturer's instructions and the Contract Documents. Uniformly distribute backfill material in layers of not more than 8 inches in depth, loose measure, and thoroughly compact each layer using approved compactors before successive layers are placed. Compact the Granular Borrow bedding and backfill in accordance with Section 203.12, Construction of Earth Embankment with Moisture and Density Control, except that the minimum required compaction shall be 92 percent of maximum density, as determined by AASHTO T 180, Method C or D. Place and compact the backfill without disturbance or displacement of the structure, keeping the fill at approximately the same elevation on both sides of the structure. Whenever a compaction test fails, the Contractor shall not place additional backfill over the area until the lift is re-compacted and a passing test achieved.

Use hand-operated compactors within five feet of the precast structure as well as over the top until it is covered with at least 12 inches of backfill. Take appropriate precautions to protect the top of the culvert from damage during backfilling and/or paving operations. Any damage to the top of the precast structure shall be repaired, or units replaced, at no cost to the Department.

534.21 Method of Measurement Precast Structural Concrete Arches, including three-sided frames, and Precast Concrete Box Culverts will be measured as one lump sum, complete, in place and accepted.

534.22 Basis of Payment The accepted Precast Structural Concrete Arches, including three-sided frames, or Precast Concrete Box Culverts will be paid for at the respective Contract lump sum price. The lump sum price shall include associated wingwalls, headwalls, toe walls, cut-off walls and appurtenances, and shall be full compensation for all labor, equipment, materials, professional services, and incidentals necessary for designing, manufacturing, furnishing and installing the precast concrete elements and accessories. Falsework, reinforcing steel, welded steel wire fabric, joint wrap, geotextile, repair material, grout, cast-in-place concrete fill or grout fill for anchorage of precast wings and/or other appurtenances will not be measured and paid for separately, but will be incidental to the lump sum pay item. Cast-in-place concrete,

reinforcing steel in cast-in-place elements and waterproofing membrane will be measured and paid for separately, under the provided Contract Pay Items. Pay adjustments for quality level will not be made for precast concrete.

Excavation for precast structural concrete structures, including excavation below culverts for bedding and backfilling, will be measured and paid for as provide in Section 206, Structural Excavation.

When the minimum cover material extends above the subgrade line, the removal of the cover material necessary to complete the work will not be paid for directly, but shall be considered incidental to the precast structural concrete lump sum pay item.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
534.70 Precast Structural Concrete Arch	Lump Sum
534.71 Precast Concrete Box Culvert	Lump Sum"

SECTION 535
PRECAST, PRESTRESSED CONCRETE SUPERSTRUCTURE

535.02 Materials Replace the title, "Portland Cement and Portland Pozzolan Cement" with the following:

"Portland Cement and Blended Hydraulic Cement" 701.01"

Add the following:

"Accelerating, Chemical Admixtures" 701.0501"

Replace the title, "Fly Ash" with the following:

"Coal Ash and Natural Pozzolans" 701.10"

Replace the title, "Ground Granulated Blast Furnace Slag" with the following:

"Slag Cement" 701.13"

Add the following:

"Combined Aggregate Grading for Concrete" 703.03"

Delete paragraph two, "Portland cement shall conform..."

Commented [TC26]: Moved language to 701.01

535.13 Concrete Replace this section with the following:

"535.13 Concrete New concrete mix designs and mix designs not previously approved by the Fabrication Engineer shall be qualified by trial batches prepared in accordance with AASHTO T 126 (ASTM C192). The test results shall demonstrate that the concrete meets the requirements of the Plans and this Specification. If accelerated curing is to be used in production, the test specimens shall be similarly cured.

The concrete mix design shall meet the following requirements:

Minimum cement content	660 lbs./cubic yard
Water-cement ratio*	0.40 (maximum)
Air entrainment	5% to 8%
Allowable Slump Flow for Self-Consolidating Concrete (SCC)	20 inches to 30 inches
Visual Stability Index (VSI) for SCC	VSI of 0 or 1, per ASTM C1611. If a mortar paste halo is present, it shall not exceed 0.25 inch.
Corrosion inhibitor**	3 gal. /c.y. (unless otherwise specified)
Silica Fume (when used)	5% to 10% of cement content by weight
Coal Ash (when used)	40% of cementitious material (maximum)
Slag Cement (when used)	50% of cementitious material (maximum)

*For the purpose of calculating water cement ratios, one U.S. gallon of water shall be considered to weigh 8.34 pounds.

**The water in the corrosion inhibitor solution shall be included when calculating the water-cement ratio.

The concrete mix design shall be proportioned so that the concrete achieves transfer strength within twenty four hours of the completion of the placement if the release strength is 6,000 psi, or less. If two consecutive placements fail to meet the above requirements, no further placements shall take place until corrective action is taken by the Contractor."

535.15 Acceptance and Quality Control Testing of Concrete Replace paragraph one, "Acceptance of structural precast/prestressed..." and paragraph two, "Quality Control concrete test..." with the following:

"Acceptance of structural precast/prestressed units, for each day's production, will be determined by the Department, based on compliance with this specification and satisfactory concrete testing results. At least once per week, the QAI will make three concrete cylinders (6 cylinders when the Contract includes permeability requirements) for use by the Department; cylinders shall be standard cured in accordance with AASHTO T 23 (ASTM C31). The QAI will perform entrained air content and slump flow testing, determine water-cement ratio and determine temperature of the sampled concrete at the time of cylinder casting. All testing equipment required by the QAI to perform this testing shall be provided in accordance with Standard Specification Section 502.041, Testing Equipment. In addition, the Contractor shall provide a slump cone meeting the requirements of AASHTO T 119. Providing and maintaining testing and curing equipment shall be considered incidental to the work and no additional payment will be made.

Quality Control concrete test cylinders shall be made for each day's cast and each form bed used. Cylinders tested to determine strand release strength and design strength shall be field cured in accordance with AASHTO T 23 (ASTM C31). 28 day cylinders shall be standard cured. Record unit identification, entrained air content, water-cement ratio, slump flow and temperature of the sampled concrete at the time of cylinder casting."

535.16 Curing by Moisture Retention Replace paragraph one, "Cure the concrete in..." with the following:

"Cure the concrete in accordance with MNL 116, Section 4.9. Moist cure the concrete until it has reached design strength."

535.17 Accelerated Curing of Concrete (Optional) Replace paragraph one, "Cure the concrete in..." with the following:

"Cure the concrete in accordance with MNL 116, Section 4.9, except as modified herein."

535.20 Finishing Concrete and Repairing Defects Replace paragraph one, "Precast/prestressed concrete products..." with the following:

"Precast/prestressed concrete products fabricated under this Section shall meet Standard Grade finish requirements as defined in MNL 116, except that the Contractor shall rub fascia units in accordance with Standard Specification Section 534.17, Rubbed Precast Finish. Abrasive blast fascia surfaces prior to finishing."

SECTION 604
MANHOLES, INLETS, AND CATCH BASINS

604.02 Materials Replace the title, "Portland Cement" with the following:
"Portland Cement and Blended Hydraulic Cement

701.01"

SECTION 609
CURB

Commented [TC27]: This section was already replaced entirely with a repair spec, suggest updating 701.01 title.

609.02 Materials Replace the title, "Portland Cement and Portland Pozzolan Cement" with the following:

"Portland Cement and Blended Hydraulic Cement

701.01"

SECTION 626
FOUNDATIONS, CONDUIT, AND JUNCTION BOXES FOR HIGHWAY SIGNING,
LIGHTING, AND SIGNALS

Commented [TC28]: Updated to address 712.061-534
move

626.036 Precast Foundations Replace this section with the following:

“626.036 Precast Foundations In the absence of foundation type and size and any other foundation-specific details and information, as designed by the Department, provided in the Contract Documents, precast foundations will be permitted for 18- and 24-inch diameter foundations for structures less than 30-feet tall with no projecting arms. No foundation design will be required for precast 18- and 24-inch diameter foundations for structures less than 30-feet tall with no projecting arms. A foundation design prepared by a Professional Engineer licensed in the State of Maine will be required for all other foundations. Where precast foundations are permitted flowable concrete fill shall be used as backfill in the annular space and placed from the bottom up. Construction of precast foundations shall conform to the Standard Details and all requirements of Standard Specification Section 534, Precast Structural Concrete, except that dimensional tolerances shall be in conformance with the applicable referenced specification or the established industry standards for the product being produced. Concrete shall be Class P1.

The construction requirements of Section 626.034 apply to precast foundations used by the Contractor and their Subcontractor(s).”

SECTION 672
PRECAST CONCRETE BLOCK GRAVITY WALL

Commented [TC29]: Updating to address 712.061-534
move

672.031 Concrete Units Replace this section with the following:

“672.031 Concrete Units The Materials Certification Letter described above shall contain the date of concrete casting, a lot identification number, compressive strength results, and entrained air results. All prefabricated concrete units shall conform to the requirements of Standard Specification Section 534, Precast Structural Concrete, with the following exceptions:

Modify Standard Specification Section 534.02, Materials, as follows. Concrete shall be Class P3. Paragraph five is not applicable to this Section.

Standard Specification Section 534.05, Facilities for Inspection, is not applicable to this Section.

Modify Standard Specification Section 534.1301, Curing, as follows.

Replace the last paragraph that starts with “The forms shall remain...” with the following: The forms shall remain in place until the concrete has gained sufficient strength such that removal of the forms and subsequent handling will not damage the units.

Add the following paragraph to the end of the section: Face texture of the units shall be a formed finish on all exposed surfaces. Pigment shall be added during the casting process of the concrete unit to achieve a consistent shade of gray or other color as determined by the Resident.

Modify Standard Specification Section 534.14, Acceptance and Quality Control Testing of Concrete, as follows.

Replace paragraph two that starts with “At least once per...” with the following: The Contractor shall make four cylinders for use by the Department to represent every 200 CY or fraction thereof.

Replace paragraph five that starts with “The Contractor shall cast...” with the following: The Contractor shall make and test at least one set of cylinders for every 50 CY of production concrete used to cast the concrete units.

Replace Standard Specification Section 534.16, Tolerances, with the following: Maximum dimensional deviation of formed unit dimensions shall be ½ -inch or 2 percent or the manufacturer’s published tolerances, whichever is less. Units not meeting the specified tolerances will be rejected.”

SECTION 672

PRECAST CONCRETE BLOCK GRAVITY WALL

Commented [TC30]: Updating to address 712.061-534
move

673.03 Materials Remove "Structural Precast Concrete Units - 712.061" from this section.

673.031 Concrete Units Replace this section with the following:

"673.031 Concrete Units The Materials Certification Letter described above shall contain the date of concrete casting, a lot identification number, compressive strength results, and entrained air results. All prefabricated concrete units shall conform to the requirements of Standard Specification Section 534, Precast Structural Concrete with the following exceptions:

Modify Standard Specification Section 534.02, Materials, as follows. Concrete shall be Class P3. Paragraph five is not applicable to this Section.

Standard Specification Section 534.05, Facilities for Inspection, is not applicable to this Section.

Modify Standard Specification Section 534.1301, Curing, as follows.

Replace the last paragraph that starts with "The forms shall remain..." with the following: The forms shall remain in place until the concrete has gained sufficient strength such that removal of the forms and subsequent handling will not damage the units.

Add the following paragraph to the end of the section: Face texture of the units shall be a formed finish on all exposed surfaces. Pigment shall be added during the casting process of the concrete unit to achieve a consistent shade of gray or other color as determined by the Resident.

Modify Standard Specification Section 534.14, Acceptance and Quality Control Testing of Concrete, as follows.

Replace paragraph two that starts with "At least once per..." with the following: The Contractor shall make four cylinders for use by the Department to represent every 200 CY or fraction thereof.

Replace paragraph five that starts with "The Contractor shall cast..." with the following: The Contractor shall make and test at least one set of cylinders for every 50 CY of production concrete used to cast the concrete units.

Replace Standard Specification Section 534.16, Tolerances, with the following: Maximum dimensional deviation of formed unit dimensions shall be 1/2 -inch or 2

percent or the manufacturer's published tolerances, whichever is less. Units not meeting the specified tolerances will be rejected."

SECTION 674

PREFABRICATED CONCRETE MODULAR GRAVITY WALL

Commented [TC31]: Updating to address 712.061-534
move

674.02 Materials Replace this section with the following:

“674.02 Materials Materials shall meet the requirements of the following subsections of Division 700 - Materials:

Gravel Borrow	703.20
Preformed Expansion Joint Material	705.01
Reinforcing Steel	709.01
Drainage Geotextile	722.02

The Contractor is cautioned that all of the materials listed are not required for every Prefabricated Concrete Modular Gravity Wall. The Contractor shall furnish the Resident a Certificate of Compliance certifying that the applicable materials comply with this section of the specifications. Precast units shall be made per Standard Specification Section 534, Precast Structural Concrete, modified as follows:

Modify Standard Specification Section 534.02, Materials, as follows: Concrete shall be Class P2. The minimum permeability of the concrete as indicated by Surface Resistivity shall be 17 KOhm-cm.

Modify Standard Specification Section 534.16, Tolerances, as follows: Dimensional tolerances shall be in conformance with established industry standards and the following tolerances. If there is a conflict between established industry standards and the tolerances below, the stricter tolerance shall be followed. All units not meeting the listed tolerances will be rejected.

1. All dimensions shall be within (edge to edge of concrete) $\pm 3/16$ in.
2. Squareness: The length differences between the two diagonals shall not exceed $5/16$ in.
3. Surface Tolerances: For steel formed surfaces, and other formed surface, any surface defects in excess of 0.08 in. in 4 ft will be rejected. For textured surfaces, any surface defects in excess of $5/16$ in. in 5 ft shall be rejected.

Joint Filler (where applicable) Joints shall be filled with material approved by the Resident and supplied by the approved Prefabricated Concrete Modular Gravity Wall supplier. 4 in. wide, by 0.5 in. preformed expansion joint filler shall be placed in all horizontal joints between facing units. In all vertical joints, a space of 0.25 in. shall be provided. All Preformed Expansion Joint Material shall meet the requirements of subsection 502.03.

Woven Drainage Geotextile Woven drainage geotextile 12 in. wide shall be bonded with an approved adhesive compound to the back face, covering all joints between units,

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including joints abutting concrete structures. Geotextile seam laps shall be 6 in., minimum. The fabric shall be secured to the concrete with an adhesive satisfactory to the Resident. Dimensions may be modified per the wall supplier's recommendations, with written approval of the Resident.

Concrete Shear Keys (where applicable) Shear keys shall have a thickness at least equal to the pre-cast concrete stem.

Concrete Leveling Pad Cast-in-place concrete shall be Fill Concrete conforming to the requirements of Section 502 Structural Concrete. Leveling pad shall have a minimum thickness of 4 inches. The horizontal tolerance on the surface of the pad shall be 0.25 in. in 10 ft. Dimensions may be modified per the wall supplier's recommendations, with written approval of the Resident.

Backfill and Bedding Material Bedding and backfill material placed behind and within the reinforced concrete modules shall be gravel borrow conforming to the requirements of Subsection 703.20. The backfill materials shall conform to the following additional requirements: backfill and bedding material shall only contain particles that will pass the 3-inch square mesh sieve and the plasticity index (PI) as determined by AASHTO T90 shall not exceed 6. Compliance with the gradation and plasticity requirements shall be the responsibility of the Contractor, who shall furnish a copy of the backfill test results prior to construction.

Materials Certificate Letter The Contractor, or the supplier as his agent, shall furnish the Resident a Materials Certificate Letter for the above materials, including the backfill material, in accordance with Section 700 of the Standard Specifications. A copy of all test results performed by the Contractor or his supplier necessary to assure contract compliance shall also be furnished to the Resident. Acceptance will be based upon the materials Certificate Letter, accompanying test reports, and visual inspection by the Resident.

SECTION 677

MECHANICALLY STABILIZED EARTH RETAINING WALL

Commented [TC32]: Updating to address 712.061-534
move

677.041 Reinforced Concrete Facing Panels Replace this section with the following:

“677.041 Reinforced Concrete Facing Panels Reinforced concrete facing panels shall meet the requirements specified in the following subsections:

Precast Structural Concrete	534
Drainage Geotextile	722.02

Concrete for reinforced concrete facing panels shall be Class P1. Tolerances and surface finish requirements shall be per Section 677.042 below.”

677.042 Precast Panel Tolerances and Surface Finish Replace this section with the following:

“677.042 Precast Panel Tolerances and Surface Finish Concrete surface for the front face shall have a smooth steel formed finish, or as noted on the plans. The rear face shall have an unformed surface finish. The rear face of the panel shall be roughly screeded to eliminate open pockets of aggregate and surface distortions in excess of ¼ in. All uncoated steel projecting from the panel unit shall be galvanized in accordance with ASTM A123 (AASHTO M 111) with a minimum coating thickness of 2 oz/ft².

Precast panel tolerances shall comply with the following; units that do not meet the listed tolerances will be rejected.

1. Panel dimensions (edge to edge of concrete) within $\pm 3/16$ in.
2. Panel thickness: $\pm 1/4$ in.
3. Squareness The length difference between the two diagonals shall not exceed $1/2$ in.
4. Distance between the centerline of dowel and dowel sleeve, and to centerline of reinforcing steel shall be $\pm 1/8$ in.
5. Face of panel to centerline of dowel and dowel sleeve, and to centerline of reinforcing steel shall be $\pm 1/8$ in.
6. Position of panel connection devices (Tie Strip) shall be ± 1 in.
7. Location of Coil and loop Imbeds shall be $\pm 1/8$ in.
8. Warping of the exposed panel face shall not exceed $1/4$ in. in 5 ft.
9. Surface defects on smooth-formed surfaces measured over a length of 5 ft shall not exceed $1/8$ in. Surface defects on textured-finished surfaces measured over a length of 5 ft shall not exceed $5/16$ in.”

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SECTION 681

PRECAST AGGREGATE-FILLED, CONCRETE BLOCK GRAVITY WALL

Commented [TC33]: Updating to address 712.061-534
move

681.03 Materials Remove "Structural Precast Concrete Units - 712.061" from this section.

681.031 Concrete Units Replace this section with the following:

"681.031 Concrete Units The Materials Certification Letter described above shall contain the date of concrete casting, a lot identification number, compressive strength results, and entrained air results. All prefabricated concrete units shall conform to the requirements of Standard Specification Section 534, Precast Structural Concrete, with the following exceptions:

Modify Standard Specification Section 534.02, Materials, as follows. Concrete shall be Class P3. Paragraph five is not applicable to this Section.

Standard Specification Section 534.05, Facilities for Inspection, is not applicable to this Section.

Modify Standard Specification Section 534.1301, Curing, as follows.

Replace the last paragraph that starts with "The forms shall remain..." with the following: The forms shall remain in place until the concrete has gained sufficient strength such that removal of the forms and subsequent handling will not damage the units.

Add the following paragraph to the end of the section: Face texture of the units shall be a formed finish on all exposed surfaces. Pigment shall be added during the casting process of the concrete unit to achieve a consistent shade of gray or other color as determined by the Resident.

Modify Standard Specification Section 534.14, Acceptance and Quality Control Testing of Concrete, as follows.

Replace paragraph two that starts with "At least once per..." with the following: The Contractor shall make four cylinders for use by the Department to represent every 200 CY or fraction thereof.

Replace paragraph five that starts with "The Contractor shall cast..." with the following: The Contractor shall make and test at least one set of cylinders for every 50 CY of production concrete used to cast the concrete units.

Replace Standard Specification Section 534.16, Tolerances, with the following: Maximum dimensional deviation of formed unit dimensions shall be ½ -inch or 2 percent or the manufacturer's published tolerances, whichever is less. Units not meeting the specified tolerances will be rejected.

SECTION 701
STRUCTURAL CONCRETE RELATED MATERIAL

701.01 Portland Cement and Portland Pozzolan Cement Replace this section with the following:

“701.01 Portland Cement and Blended Hydraulic Cement Portland cement for Cast-in-place concrete shall conform to the requirements of AASHTO M 85, Type II. Blended hydraulic cement for cast-in-place concrete shall conform to the requirements of AASHTO M 240, Type IS, Type IP, Type IL, or Type IT. Blended hydraulic cement special property (HE), high early strength, will not be allowed for cast-in-place concrete.

Commented [TC34]: Reorganization of CIP cement requirements

Portland cement for precast prestressed concrete shall conform to the requirements of AASHTO M 85, Type I, Type II, or Type III. Blended hydraulic cement for precast concrete shall conform to the requirements of AASHTO M 240, Type IS, Type IP, Type IL, or Type IT. Blended hydraulic cement special property (HE), high early strength, will be allowed for precast concrete.

Commented [TC35]: Move language from 535 to 701.01

Portland cement for precast concrete shall conform to the requirements of AASHTO M 85, Type I, Type II, or Type III. Blended hydraulic cement for precast concrete shall conform to the requirements of AASHTO M 240, Type IS, Type IP, Type IL, or Type IT. Blended hydraulic cement special property (HE), high early strength, will be allowed for precast concrete.

Commented [TC36]: Move language from 534/712.061 to 701.01

Portland Cement A hydraulic cement produced by pulverizing Portland cement clinker, and usually containing calcium sulfate.

Blended Hydraulic Cement A hydraulic cement consisting of two or more inorganic constituents (at least one of which is not portland cement or portland cement clinker) which separately or in combination contribute to the strength-gaining properties of the cement (made with or without other constituents, processing additions and functional additions, by intergrinding or other blending).

Commented [TC37]: Updated ASTM C219 terminology

Only one brand of cement shall be used on any one contract unless otherwise permitted, in writing, by the Resident. The cement shall be completely protected from rain and moisture during storage. Partially set cement or cement that contains caked lumps shall not be used.

Commented [TC38]: Moved language from 502.04 to 701.01

The Contractor shall arrange for the cement supplier to provide a Manufacturer's Certification (Mill Test Report) for all cement materials furnished for use on the project. Reports shall include all mandatory and optional requirements specified in AASHTO M 85 or AASHTO M 240 including any processing additions. Reports shall represent the cement incorporated into the project and reports shall be supplied, at a minimum, on a monthly basis. Reports shall be submitted to the Department's Materials Testing Engineer."

701.03 Air-Entraining Chemical Admixtures Replace this section with the following:

“701.03 Air-Entraining Chemical Admixtures Air-entraining admixtures shall be tested by AASHTO Product Evaluation & Audit Solutions and conform to the requirements of AASHTO M 154.

Commented [TC39]: AASHTO's new name for NTPEP

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The material used shall be one of the products listed on the Maine Department of Transportation's Qualified Products List."

701.04 Water Reducing Chemical Admixtures Replace this section with the following:

"701.04 Water Reducing Chemical Admixtures Water reducing admixtures shall be tested by AASHTO Product Evaluation & Audit Solutions and conform to the requirements of AASHTO M 194, Type A.

The material used shall be one of the products listed on the Maine Department of Transportation's Qualified Products List."

Leave 701.0401 per George 10/15/25 meeting

701.05 Set-retarding Chemical Admixtures Replace this section with the following:

"701.05 Set-retarding Chemical Admixtures Set-retarding admixtures shall be tested by AASHTO Product Evaluation & Audit Solutions and conform to the requirements of AASHTO M 194, Types B or D or G."

Commented [TC40]: Added Type G

The material used shall be one of the products listed on the Maine Department of Transportation's Qualified Products List."

Add the following:

"701.0501 Accelerating, Chemical Admixtures Accelerating admixtures shall be tested by AASHTO Product Evaluation & Audit Solutions and conform to the requirements of AASHTO M 194, Types C or E.

Commented [TC41]: New material specification for accelerating admixtures. Not currently covered in our specifications

The material used shall be one of the products listed on the Maine Department of Transportation's Qualified Products List."

701.10 Fly Ash Replace this section with the following:

"701.10 Coal Ash and Natural Pozzolans Coal Ash shall conform to the chemical and physical requirements of AASHTO M 295, Class F or Class C coal ash.

Natural pozzolans shall conform to the chemical and physical requirements of AASHTO M 295, Class N."

Commented [TC42]: Class N suppliers are starting to pop up around the nation.

Coal ash and natural pozzolans shall be stored in weather tight silos. All silos shall be completely empty and clean before material is deposited therein, unless the silo already contains material of the same type and properties."

Commented [TC43]: Moving language from 502.04 to 701.10

701.11 Calcium Nitrite Solutions, Chemical Admixtures Replace this specification with the following:

"701.11 Calcium Nitrite Solution, Chemical Admixture Calcium nitrite solutions shall be tested by AASHTO Product Evaluation & Audit Solutions and conform to the requirements of ASTM C1582. An approved calcium nitrite based corrosion inhibitor shall be added to the concrete mix as an aqueous solution.

Commented [TC44]: New ASTM standard specifically for CNI

The material used shall be one of the products listed on the Maine Department of Transportation's Qualified Products List."

701.13 Ground Granulated Blast Furnace Slag Replace this section with the following:

"701.13 Slag Cement Slag cement shall conform to the chemical and physical requirements for Grade 100 or 120 as listed in AASHTO M 302.

Slag cement shall be stored in weather tight silos. All silos shall be completely empty and clean before material is deposited therein, unless the silo already contains material of the same type and properties.

Commented [TC45]: Moving language from 502.04 to 701.13

The Contractor shall arrange for the slag cement supplier to provide a Manufacturer's Certification (Mill Test Report) for all slag cement materials furnished for use on the project. Reports shall include all mandatory and optional requirements specified in AASHTO M 302 including any processing additions. Reports shall represent the slag cement incorporated into the project and reports shall be supplied, at a minimum, on a monthly basis. Reports shall be submitted to the Department's Materials Testing Engineer."

SECTION 703
AGGREGATES

Commented [TC46]: This section is already a repair spec, suggested updates below.

703.01 Fine Aggregate for Concrete Replace this section with the following:

“703.01 Fine Aggregate for Concrete Fine aggregate for concrete shall consist of natural sand or, when approved by the Resident, other inert materials with similar characteristics or combinations thereof, having strong, durable particles. Fine aggregate from different sources of supply shall not be mixed or stored in the same pile nor used alternately in the same class of construction or mix without permission of the Resident.

All fine aggregate shall be tested for qualities in Table 1. Fine aggregate unable to meet quality requirements of Table 1 shall be rejected or take corrective actions to meet quality requirements.

Table 1

Description	Test Method	Specification Limit
Organic Impurities	AASHTO T 21	Laboratory Designation Plate III, max
Sand Equivalent	AASHTO T 176	75, min.
Gradation	AASHTO T 27 & T 11	Table 2 below
Fineness Modulus	*	2.26 to 3.14
Absorption	AASHTO T 84	2.3 percent, max
ASR, no mitigation	Standard Specification 703.0201	
ASR, with mitigation (When applicable)	Standard Specification 703.0201	

* The fineness modulus of fine aggregate shall be determined by adding the cumulative percentages of material by weight retained on the following sieves: Nos. 4, 8, 16, 30, 50, 100 and dividing by 100.

Table 2

Sieve Designation	Percentage by Weight Passing Square Mesh Sieves
3/8 inch	100
No. 4	95-100
No. 8	80-100
No. 16	50-85
No. 30	25-60
No. 50	10-30
No. 100	2-10
No. 200	0-5.0

703.02 Coarse Aggregate for Concrete Replace this section with the following:

“703.02 Coarse Aggregate for Concrete Coarse aggregate for concrete shall consist of crushed stone or gravel having hard, strong, durable pieces, free from adherent coatings. Each pile of a designated coarse aggregate grading, size, or blended material, shall be stored in separate stockpiles and not be mixed with adjacent stockpiles.

All coarse aggregate for concrete shall be tested for qualities in Table 1. Coarse aggregate unable to meet quality requirements of Table 1 shall be rejected or take corrective actions to meet quality requirements.

Table 1

Description	Test Method	Specification Limit
Flat, Elongated, or Flat & Elongated Particles*	ASTM D4791 (Dimensional Ratio 1:5)	15 percent, max (by weight)
Micro-Deval Or LA Wear	AASHTO T 327 Or AASHTO T 96	18.0 percent, max Or 40 percent, max
Gradation**	AASHTO T 27 & T 11	Table 2 below
Absorption	AASHTO T 85 (modified for sample weight)	2.0 percent (by weight)
ASR, no mitigation	Standard Specification 703.0201	
ASR, with mitigation (When applicable)	Standard Specification 703.0201	

Commented [TC47]: Same idea as updated Fine aggregate specification.

* Samples shall represent the composite blend, of the proposed mix design, retained on the 3/8 inch sieve.

**Gradations shall conform to specified grading designation and shall be well graded between the limits specified.

Table 2

Sieve Designation	Percentage by Weight						
	Passing Square Mesh Sieves						
Grading	S	A	AA	SP-1-7	SP-1-78	SP-2-8	SP-2-89
Aggregate Size	1 1/2 inch	1 inch	3/4 inch	1/2 inch	1/2 inch	3/8 inch	3/8 inch
2 inch	100						
1 1/2 inch	95-100	95-100					
1 inch	-	-	100				
3/4 inch	35-70	-	90-100	100	100		
1/2 inch	-	25-60	-	90-100	90-100	100	100
3/8 inch	10-30	-	20-55	40-70	40-75	85-100	90-100
No. 4	0-5	0-10	0-10	0-15	5-25	10-30	20-55
No. 8	-	0-5	0-5	0-5	0-10	0-10	5-30
No. 16	-	-	-	-	0-5	0-5	0-10
No. 50	-	-	-	-	-	-	0-5
No. 200*	0-1.5	0-1.5	0-1.5	0-1.5	0-1.5	0-1.5	0-1.5

* This limit will be 0-2.0 for Department production samples. Yearly quality samples will be held to 0-1.5."

703.0201 Alkali Silica Reactive Aggregates Replace this section with the following:

"703.0201 Alkali Silica Reactive Aggregates All coarse and fine aggregates proposed for use in concrete shall be tested for Alkali Silica Reactivity (ASR) potential. All coarse and fine aggregates shall meet the specification limits of at least one test method below in Table 1.

Table 1

Test Method & Duration	Specification Limit	Minimum Testing Frequency
AASHTO T 303 (ASTM C1260), 16 days from casting	0.06%, max	Every five years
ASTM C1567, 16 days from casting	0.06%, max	Every five years
ASTM C1293, 1 year	0.04%, max	Every six years
AASHTO TP 144, 21 days	Nonreactive	Every five years

Acceptable pozzolans and chemical admixtures that may be used when an aggregate is classified as potentially reactive include, but are not limited to the following:

- Class F Coal Ash meeting the requirements of AASHTO M 295
- Slag Cement (Grade 100 or 120) meeting the requirements of AASHTO M 302
- Densified Silica Fume meeting the requirements of AASHTO M 307
- Lithium-based admixtures
- Metakaolin

Pozzolans or chemical admixtures required to offset the effects of potentially reactive aggregates will be incorporated into the concrete at no additional cost to the Department.

The Department may reject aggregate sources with known field history of ASR reactions, regardless of test results above.”

Commented [TC48]: I checked a handful of other States Specifications and we are the only state using a modified 30 day test, the rest use the standard 16 days. Attached excel sheet shows our history of ASR results received from contractors. 30 day results, on average, are 2x the 16 day test. I recommend changing to 16 day test, but we can use a conservative specification limit. Most states have a limit of 0.08% or 0.10% at 16 days. A 0.06% limit will give us a similar conservative ASR limit to what we have now, but be cheaper and faster for industry.

Commented [TC49]: Our Canadian suppliers use 1 year test, our current specifications don't cover this test method.

Commented [TC50]: New FHWA test method.

Commented [TC51]: Folsom submitted test results on Odlin Rd Quarry in Bangor with a 50% slag replacement per ASTM C1260 with results of 0.10%. Odlin Rd is a known highly reactive ASR aggregate based on history.

SECTION 712
MISCELLANEOUS HIGHWAY MATERIAL

712.061 Structural Precast Concrete Units Replace this section with the following:

“712.061 Structural Precast Concrete Units Shall be made per Standard Specification Section 534.”

SECTION 504 STRUCTURAL STEEL

GENERAL REQUIREMENTS

504.01 Description This work shall consist of detailing, fabricating and erecting structural steel bridges, ancillary bridge products and other steel structures. Materials, ~~workmanship, inspection and documentation not specifically addressed by this Specification shall ~~done be~~ done~~ in accordance with the applicable sections of the AASHTO/AWS D1.5 Bridge Welding Code including Commentary (the D1.5 Code), the AASHTO Guide Specification For Highway Bridge Fabrication with HPS 70W (HPS 485W) STEEL (the Fab Guide) and other Standards and Specifications referenced herein. The edition governing the work shall be the edition in effect on the date that the Contract was awarded.

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Commented [JS1]: Clarifies the AWS D1.5 welding code version to be used. 2025 just came out and 2020 has been in use on projects.

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ALL REQUIREMENTS IN THIS SPECIFICATION ARE THE RESPONSIBILITY OF THE CONTRACTOR UNLESS NOTED OTHERWISE.

504.02 Materials Materials shall meet the requirements of the following sections of Division 700-Materials:

Structural Steel

713.01	
Heavy-Hex Structural Bolts, Washers, Nuts and DTI's	713.02
Pre-formed Pads	
713.03	
Bronze or Copper-Alloy Bearing and Expansion Plates	713.04
Cold-Finished Carbon Steel Shafting	
713.05	
Castings	
713.06	

Note: The Department maintains a list of pre-approved welding consumables that the Contractor may use without furnishing Certificates of Conformance from the electrode/consumable manufacturer. This list is available on the Department's Qualified Products List of Electrodes for Field Welding.

504.03 Drawings Prepare shop detail, erection and other necessary drawings in accordance with Section 105.7-Working Drawings. Show nondestructive examination symbols on the Shop Drawings. Include a fastener assembly table showing the number, size, length location and number of all bolts. Procedure Qualification Records (PQR) and Weld Procedure Specifications (WPS) are part of the shop drawing submittal. Weld Procedure Specifications that have been previously reviewed by the Department and are in conformance with the D1.5 Code need not be re-submitted. The drawings will be reviewed in accordance with the applicable requirements of Section 105.7 of the Standard Specifications, the AASHTO/NSBA Shop Detail Drawing Review/Approval Guidelines, G1.1 and this Specification. Review times will be in accordance with Section 105.7.2 of the Standard Specifications.

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504.04 Facility Requirements Fabricate ~~structural~~ steel in a facility holding a current AISC or Department shop certification as follows:

Type of Product	Type of Certification Required ^{1,2,3,4}
Simple Bridges: Unspliced Rolled Sections Structural Steel Repair Items (excluding replacement girders)	AISC Certified Bridge Fabricator Simple (SBR)
Intermediate Bridges: Examples: 1) Rolled beams w/ field or shop splice(s), straight or with radius >500ft. 2) Welded plate girder with constant web depth, with or without splices, straight or with radius >500ft. 3) Welded plate girder with variable depth webs, straight or with radius >1000ft. 4) Trusses 200ft or less in length, either entirely or substantially preassembled at the certified facility and shipped in no more than three subassemblies.	AISC Certified Bridge Fabricator Intermediate (IBR)
Advanced Bridges: Examples: 1) Structures that include the use of High Performance Steel (HPS) 2) Tub or trapezoidal box girders 3) Closed box girders 4) Large or non-preassembled trusses 5) Arches 6) Bascule bridges 7) Cable-supported bridges 8) Movable bridges 9) Bridges with tight curve radii	AISC Certified Bridge Fabricator Advanced (ABR)
Ancillary Products (as defined in Section 713.01) and Support Structures (as defined in Section 504.58)	AISC Certified Bridge Fabricators Simple (SBR) or AISC Bridge and Highway Component Manufacturer (CPT)

Type of Product	Type of Certification Required ^{1,2,3,4}
1. Welded Plate Girders 2. Spliced Rolled Beams 3. Complex Bridges and Movable Bridges 4. All Structures that include the use of High Performance Grade Steel (HPS)	AISC CBR
1. Unspliced Rolled Beam Bridges	AISC CBR or SBR

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- Commented [JS2]: Updates the AISC certifications which were redone in 2023(?) Clarifications added on product type to align with the certification intent per AISC. Confirmed similar breakdown used by other NE states
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2. Steel for Bridge Repair and Rehabilitation	
1. Ancillary Products (See Section 713.01)	Any AISC Fabrication Certification or
2. Structural Supports (See Section 504.58)	MaineDOT

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¹ Application of protective coatings requires a ~~Complex Coating Endorsement~~ "CCEP" endorsement or SSPC QP3 Certification.

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² Fracture Critical fabrication requires an ~~Fracture Control~~ "F" Endorsement "FCE".

³ All materials fabricated in a non-certified shop will be rejected.

⁴ Work shall not be subcontracted to a non-certified facility, except that machining operations (i.e., cutting, drilling, milling) may be performed in non-certified facilities, as approved with written approval by the Fabrication Engineer.

504.05 Notice of Beginning Work. ~~Give Provide~~ the Fabrication Engineer with a minimum of two weeks' notice for in-state work and three weeks' notice for out-of-state work prior to beginning production. Provide the Fabrication Engineer with a copy of the production schedule. If the production schedule changes, notify the Fabrication Engineer no less than 3 working days prior to the initial start-up date. If work is suspended on a project, the Fabrication Engineer will require 72 ~~hours notice~~ hours' notice prior to the resumption of work. Any work done without the Quality Assurance Inspector (QAI) present will be subject to rejection.

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504.06 ~~Fabrication Inspection~~ Quality Control (QC) is the responsibility of the Contractor and shall be performed as required by the D1.5 code. Inspect all aspects of the work and supervise all nondestructive examination testing (NDE). Record measurements and test results in a clear and legible manner. Reject materials and workmanship that do not meet contract requirements. The Contractor may perform ~~NDE NDT~~ in addition to the minimum required. Provide a copy of all measurements and testing to the QAI.

Quality Assurance (QA) is the prerogative of the Department. The QAI will ensure that the QC Department is performing properly, verify documentation, periodically inspect workmanship and witness ~~NDENDT~~. The QAI will schedule testing deemed necessary by the Fabrication Engineer in addition to the minimum testing requirements in a manner that minimizes interference with the production schedule.

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504.061 Fabrication Inspection Personnel

A. QC Inspector shall be qualified in accordance with the D1.5 code, as follows:

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(1) The Inspector shall be an AWS Certified Welding Inspector (CWI) qualified and certified in conformance with the provisions of AWS QC1, Specification for AWS Certification of Welding Inspectors, or

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(2) The Inspector shall be qualified by the Canadian Welding Bureau (CWB) to the Level II or Level III requirements of the Canadian Standard Association (CSA) standard W178.2, Certification of welding inspectors, or

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(3) Upon written request to the Fabrication Engineer, the Contractor may request approval to use an Inspector who, by training and experience in metals

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~~fabrication, inspection and testing, is found to be equivalent to either (1) or (2).~~

~~B. NDT Technician/Inspector shall be qualified in accordance with the D1.5 code, as follows:~~

~~(1) Personnel performing NDT, other than visual examination, shall be certified in conformance with the American Society for Nondestructive Testing's (ASNT) Recommended Practice No. SNT TC 1A, Personnel Qualification and Certification in Nondestructive Testing.~~

~~Individuals who perform NDT shall be certified as:~~

- ~~a. NDT Level II, or~~
- ~~b. NDT Level I working under the direct supervision of an individual qualified for NDT Level II or NDT Level III.~~
- ~~c. NDT Level III and qualified per ASNT SNT TC 1A as a Level II for NDT performed.~~

504.07 Inspector's Authority The QAI has the authority to reject material or workmanship that does not meet the contract requirements. The acceptance of material or workmanship by the QAI will not prevent subsequent rejection if the work or material is found unacceptable.

504.08 Rejections Correct or replace rejected material and/or workmanship. Generate a non-conformance report (NCR). Provide a copy to the QAI and forward a copy to the Fabrication Engineer for review and comments. Structural Defects: Repair structural defects only with the approval of the Fabrication Engineer. Submit a nonconformance report (NCR) to the Fabrication Engineer with a proposed repair procedure. Do not perform structural repairs without an NCR that has been reviewed by the Fabrication Engineer. Give the QAI adequate notice prior to beginning structural repairs.

In the event that an item fabricated under this Specification does not meet the contract requirements but is deemed suitable for use by the Department, said item may be accepted in accordance with Section 100 of the Standard Specifications (see 106.8), Non-Conforming Work.

504.09 Facilities for Fabrication Inspection Provide a private office at the fabrication plant for QA personnel. The office shall be in close proximity to the work. The office shall be climate controlled to maintain the temperature between 68° F and 75° F and have the exit(s) closed by a door(s) equipped with a lock and two keys which shall be furnished to the QAI (s).

The QAIs' office shall meet the following minimum requirements:

Description
Quantity

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Office area (minimum ft ²)	
100	
Drafting Table Surface (ft ²)	
35	
Drafting stools-each	
1	
Office Desk	
1	
Ergonomic Swivel Chairs	1 per
inspector	
Folding Chairs	
2	
High-speed internet connection (ports) or wireless	1 per inspector
Fluorescent Lighting of 100 ft-candles minimum for all work areas	2
110 Volt 60 Cycle Electric Wall Outlets	
3	
Wall Closet	
1	
Waste Basket with trash bags	
1	
Water Cooler	
1	
Broom	
1	
Dustpan	
1	
Cleaning Materials-floor, surfaces, windows -	duration of the project

The Contractor is responsible for disposing of trash and supplying commercially bottled water for the water cooler.

The QAI will have the option to reject any furniture or supplies provided to the Inspector's Office based on general condition.

Provide parking spaces for QA personnel in close proximity to the QAIs' Office. Maintain the pathway between the parking area and the QAIs' office so that it is free of obstacles, debris, snow and ice.

The facilities and all furnishings shall remain the property of the Contractor upon completion of the work. Payment for the facilities, heating, lighting, telephone installation, internet connection, basic monthly telephone and internet charges and all furnishings shall be incidental to the Contract.

Failure to comply with the above requirements will be considered denial of access to work for the purpose of inspection. The Department will reject all work done when access for inspection is denied.

504.10 Mill Test Reports Provide legible Certified Mill Test Reports (CMTRs) for all steel and iron material. Provide the CMTRs prior to fabrication. If the Contractor begins fabrication, including cutting material, before the QAI has verified the CMTRs and mill markings, the material will be rejected.

Furnish Certified Mill Test Reports for fasteners. The supplier shall perform a Rotational Capacity Test (RCT) for both plain and galvanized bolts in accordance with AASHTO M 164M/M 164 (ASTM A 325) for each combination of bolts, nuts and washers supplied. Each combination shall be assigned a unique Rotational Capacity (R-C) lot number.

504.11 Material Identification and Control Mark steel plates and shapes as specified in AASHTO M 160 (ASTM A 6). Only use material from stock if it can be positively identified, properly documented and the direction of rolling can be determined.

Store material and fabricated items off the ground. Protect the material and fabricated items from dirt, grease, other foreign materials and significant corrosion.

Store fasteners in a protected environment. Provide four fastener assemblies for each lot, length and combination to the Fabrication Engineer for testing. A fastener assembly consists of a bolt, washer, nut and direct tension indicator (when required). Provide the fastener samples to the Fabrication Engineer immediately upon delivery to the fabrication shop or job site.

Provide Certificates of Conformance for welding consumables that are not on the Department's pre-approved electrode list.

504.12 Protective Coatings If paint is specified, apply the coating in accordance with Section 506 of the Standard Specifications or Special Provision 506 as applicable.

When galvanizing is specified, clean the steel in accordance with SSPC-SP 6 prior to galvanizing. Galvanize in accordance with AASHTO M 111 (ASTM A 123). Galvanize fasteners in accordance with ASTM F 2329-05 or AASHTO M 198 Class 50 (ASTM B 695 Class 50). Galvanized nuts shall be lubricated with a water-soluble lubricant containing a dye that contrasts with the color of the galvanizing.

504.13 Unpainted Steel Clean all surfaces to a minimum SSPC-SP 6, Commercial Blast Cleaning. Steel may be abrasive-blast cleaned prior to fabrication. Clean steel that is abrasive cleaned prior to fabrication in accordance with SSPC-SP 6 shall be cleaned in accordance with SSPC-SP 1 Solvent Cleaning after fabrication is complete. Disassemble bolted field splices and solvent clean all faying surfaces in accordance with SSPC-SP 1

Solvent Cleaning after drilling or reaming is complete. Inspect the splices prior to re-assembly.

HIGHWAY BRIDGE FABRICATION

504.14 Materials for Bridges The grade of steel is designated on the Plans. Do not substitute material without the approval of the Fabrication Engineer.

504.15 Handling Material Handle material in a manner that prevents nicks, gouges or other damage from chains, wire ropes or other handling devices during all phases of fabrication.

504.16 Plates for Fabricated Members Cut plates subject to calculated stress, including splice plates, so that the direction of rolling is parallel to the primary stresses. The direction of primary stresses for web and field splice material is parallel to the flanges unless otherwise shown. Transfer heat numbers to each primary member used in fabrication. Primary members include flanges, webs, splice plates, bearing stiffeners, connection plates and diaphragm material on curved bridges.

504.17 Correcting Materials Correct material by a method that does not damage the material. If heating of the steel is required, submit a written procedure to the Fabrication Engineer for review. Do not use external force in conjunction with heating unless authorized in the procedure. Following corrective work, inspect the steel with nondestructive testing methods acceptable to the Fabrication Engineer. The presence of cracks or fractures will be cause for rejection of the material.

504.18 Base Metal Repairs Make base metal repairs in accordance with the D1.5 Code. Submit an NCR to the Fabrication Engineer for review if the repair area exceeds the allowable limits for base metal repairs as specified in the D1.5 Code. Notify the QAI prior to beginning the repairs.

504.19 Thermal Cutting Thermal cut steel using automatic equipment or a mechanical guide. Adjust the rate of travel of the cutting equipment to prevent hardening the steel. Do not cut material freehand.

504.20 Edge Hardness Edge Hardness testing is not required.

504.21 Edge Planing Plane sheared edges of plates greater than 5/8 inch thick to a depth of 3/16 inch.

504.22 Bent Plates Cold-bend rolled steel plates in accordance with the AASHTO/NSBA S 2.1 Steel Bridge Fabrication Guide Specifications, Table 4.2 and the following:

- (a) The bend line will be at right angles to the direction of rolling.

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