January 2026 Specifications Committee Meeting

SPECIFICATIONS COMMITTEE MEETING AGENDA

Meeting Date
Tuesday, January 27, 2025 @ 9:00AM
Meeting Location: 190 Dry Branch Road, Conference Room, MCS&T Division, Charleston, WV
Also meeting virtually via Google Meet video conference. E-mail distribution message includes instruction.

Approved Supplemental Specification changes from last Committee meeting (12/25)

- **101.2-Definitions:** The revision adds and updates definitions for Consultant, Subcontractor, Delivery Tickets, Paper Tickets, Image File Tickets, and Electronic Tickets.
- **106.1.4-Use of Domestic Construction Materials:** The revision add routes to waive Build America Buy America requirements and where to find that information.
- **107.14-Responsibility for Damage Claims:** The revision clarifies language and broadens the indemnity clause expanding on losses and exceptions.
- **406.3-Acceptance Testing:** The revision removes Subsection 406.3.1-Skid Testing.
- **659.2,660.2, 662.2-"Materials":** The revision states that Materials wanting to be included on Approved Product Lists (APL's) are subject to field evaluations and provides details and timeline for that process.
- **420.3-Mixture Requirements:** The revision adds the new T420 Form as a requirement to be used when submitting micro surfacing job mix formulas (JMF) for approval.
- **506.3-Proportioning:** The revision updates methods of calibration and adds reference to MP 679.02.99.
- **642.4-General Requirements:** The revision adds the WVDOH Environmental Construction Inspection Form.

Approved Special Provisions (SP) from last Committee meeting (09/24/25)

- **SP207.7-Settlement Pins:** The revision removes Geotechnical personal from the scope of work.
- **SP689-Cathodic Protection of Concrete Structures:** The Special Provision establishes requirements and outlines materials, design, performance criteria, etc.

Items removed from the Agenda:

- **651-Furnishing and Placing Soil**
- **652-Seeding and Mulching**
- **715.25-.32-Ground Agricultural Limestone, Fertilizers, Mulch Material, Seed, Inoculating Bacteria Growth Stimulants, and Hydraulic Growth Material.**

Important Announcements:

- **2026 Supplemental Specifications Manual**
- **Janie Adkins and Steve Boggs returning as consultants.**

January 2026 Specifications Committee Meeting

Old Business Items

SECTION	TITLE	DESCRIPTION
642	**642.6-Silt Fence** **642.7-Method of Measurement** D. Kirk	**7th time to Committee! (January, March, May, July, September, December, January)** Specification Change to Section 642, Subsection 642.6 Silt Fences. The revision updates APL's and adds guidance for installation and Silt Fence selection. This was previously approved but has been pulled for review of several unaddressed comments made by the CAWV and Industry. This item is pending revision and will not be voted on.
601	**601.1–Description, 601.2–Materials, 601.3-Proportioning, 601.4-Testing, 601.8-Forms, 601.9-Adverse Weather Conditions, 601.10-Placing Concrete, 601.12-Curing and Protecting Concrete** Developed by WVU Vetted by A. Thaxton	**6th time to Committee! (March, May, July, September, December, January)** Specification Change to Section 601-Structural Concrete. The revision adds requirements for Class M concrete. WVU was contracted to research and develop a specification for mass concrete. This item was tabled by the champion last meeting.
SP697	**697-Safety Inspection of In-Service Bridges During Construction.** T. Brown	**2nd time to Committee! (December, January)** Special Provision for Section 697-Safety Inspection of In-Service Bridges During Construction. The revision updates names for NBI inspection and reduces the time to submit reports to align better with our Consultant Inspection Contracts.
SP	**SP__- Electronic Submission of Payrolls and Subcontractor Payments** D. Ballard	**2nd time to Committee! (December, January)** Special Provision for Electronic Submission of Payrolls and Subcontractor Payments. The revision clarifies language and use while removing all references to Disadvantages Business Enterprises (DBE's).

January 2026 Specifications Committee Meeting

New Business Items

720	**Section 720-Smoothness Testing** C. Farley	**1st time to Committee!** Specification Update to Section 720 Smoothness Testing. The revision makes small language and grammar updates throughout the section. The revision also includes the addition of section 720.7-Testing of Bridge Decks and Approaches as well as subsections and tables for their new proposed section.
SP601	**Special Provision 601 "Class S Concrete"** A. Thaxton	**1st time to Committee!** Special Provision 601 for Class S Concrete, proposing changes to section 601.3-Proportioning. The revision expands upon the section referring to Shrinkage and updates reference section numbers.

Deadline for new items & updates for the March 3rd, 2026 Meeting are due February 6th, 2026.

If you are the '**champion**' of any Specification Changes and/or Project Specific Special Provisions currently in the Specification Committee, it is your responsibility to edit/update/revise your items in a timely manner per Specification Committee Guidelines.
NOTE: *Failure to submit updates may result in removal of item and/or delays.*

Comments
Comments are requested for Specifications Changes and Project Specific Special Provisions as they help in the decision-making process. Please send comments by Friday prior to the meeting!

Please Send Comments to: **Jacinda.n.Chapman@WV.gov**

File Format Structure and Progression of items through Specifications Committee
The purpose of the below protocol is to provide guidance on the file structure of Proposed Specifications & Project Specific Provisions as they progress through Specifications Committee. This procedure would facilitate a means of tracking changes from meeting to meeting as the agenda & provisions are posted publicly online on the Spec Committee website.

TYPES OF PROVISIONS:
There are three standard types of provisions typically discussed in committee:

1. **Specification Changes** – These are permanent changes to the WVDOH Standard Specifications.
    - Unless inserted into a project proposal, these changes typically go into effect in January (of subsequent year) with the Supplemental Specifications
2. **Special Provisions (SP)** – Are applied to an individual project or a small group of projects and require two (2) meetings for approval.
3. **Project Specific Special Provisions (PSSP)** – Can be shown to committee-but not required, does not require two (2) meetings for approval, **REQUIRES MANAGEMENT APPROVAL** (from the State Highway Engineer level or above). Project Specific Special Provisions are applied to only an individual project.

NEW BUSINESS ITEMS:

January 2026 Specifications Committee Meeting

New items should be setup & submitted in the following format along with a brief overview of the item or reason for the change:

1. **Specification Changes** – Show as red-line copy (see note)
2. **Project Specific Special Provisions (SP)** – Will be shown in all black.
3. **Updates to approved SP** – Shown as red-line copy.

NOTE: Red-line copy is a form of editing which indicates removal or addition of text. You can redline a Microsoft Word document by using the built-in "Track Changes" feature.

OLD BUSINESS ITEMS:

Updated provisions that were discussed at the last committee meeting should be set up in the following format:

- Redline copy from prior meeting would not be shown.
- Redline copy of new changes/updates (from previous meeting)

PROGRESSION OF ITEMS THRU COMMITTEE AND APPROVAL:

Depending on how important the project and/or comments/discussion of item at previous meeting, then several things can happen in no particular order.

- Few comments/discussion/minor changes…will recommend approval of item at next meeting.
- A lot of comments/discussion…will not recommend approval at next meeting; item will be updated and reviewed again at the next meeting.
- SPs in committee may be used in advertised project. Hope to work to address comments & finish approving at subsequent meeting.

2023 Standard Specification Roads and Bridges and the 2025 Supplemental Specifications Manuals

Both available on our Publications Webpage:

https://transportation.wv.gov/highways/mcst/Pages/specifications.aspx

Both available for order:

https://transportation.wv.gov/highways/mcst/Specifications/BLANKBookOrderFormSpec23Sup25202504 01-MCST.pdf

NOTE: WVDOH Employees may contact Jacinda Chapman or stop by MCS&T for a copy(ies).

DRAFT

February 11, 2025

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

~~**STATE PROJECT NUMBER:**~~ _____

~~**FEDERAL PROJECT NUMBER:**~~ _____

SECTION 642
TEMPORARY POLLUTION CONTROL

642.6-TEMPORARY PIPE, CONTOUR DITCHES, BERMS, SLOPE DRAINS, ROCK CHECK DAM, SILT FENCE, AND SUPER SILT FENCE:

REMOVE AND REPLACE 642.6.5 WITH THE FOLLOWING:

642.6.5-Silt Fence: The ~~minimum~~ height above ground for the silt fence shall be sixteen (16) ~~-~~inches and twenty-four (24) inches~~two (2) feet~~. Minimum embedment depth shall be eight (8) inches. ~~The maximum post spacing shall be based on elongation of the geotextile as measured in accordance with Test Method D 4632. Silt fence geotextile with elongation 50 % shall have a maximum post spacing of four (4) feet. Silt fence geotextile with elongation < 50 % shall have a maximum post spacing of 6.5 feet. When silt fence is installed in valleys where water can pond behind the fence then the post spacing shall be half of the maximum post spacing for the geotextile used.~~

~~When silt fence is installed by the trenching method the geotextile at the bottom of the fence shall be buried in a "J" configuration to a minimum depth of eight (8) inches in a trench so that no flow can pass under the silt fence. Backfill the trench and compact the soil over the geotextile.~~

~~When silt fence is installed by the soil slicing method the geotextile shall be installed in a slit in the soil eight (8) to twelve (12) inches deep so that no flow can pass under the silt fence. Create the slit such that a horizontal chisel point (approx. 3 inches wide) at the base of a soil slicing blade (approx. ¾ inches wide) that slightly disrupts soil upward as the blade slices through the soil. This upward disruption minimizes horizontal compaction and creates an optimal soil condition for mechanical compaction against the geotextile. Overturning of the soil shall not be permitted. The geotextile shall be mechanically inserted directly behind the soil slicing blade in a simultaneous operation, achieving consistent placement and depth.~~Soil along the fence shall be compacted to ensure that the fence fabric is well anchored in the soil.

The silt fence geotextile shall be spliced together with a sewn seam only at a support post, or two sections of fence may be overlapped.

Silt fence posts shall be driven to a minimum of twenty (20) inches into the ground. This depth shall be increased to two (2) feet if the fence is placed on a slope of 3:1 or greater. Where the minimum

depth is ~~impossible~~ difficult to attain, the steel posts may be necessary. ~~shall be adequately secured to prevent overturning of the fence due to loading.~~ The geotextile shall be properly fastened to the upslope side of the fence posts.

Silt fences shall be continuous and transverse to the flow. The silt fence shall follow the level contours of the site ~~as closely as possible~~to prevent concentrated flow. ~~Place the fence such that the water cannot runoff around the end of the fence~~To prevent water from flowing around the end of the silt fence, turn the ends of the fence upslope.

~~The silt fence trench shall be compacted on the upstream side first, and then the downstream side. The silt fence trench shall be compacted to a minimum of 90% of the original ground density and the posts must be installed after compaction of the trench. The trench compaction will be based on visual inspection and the engineer may require compaction testing to verify the visual inspection.~~

The contractor shall inspect and maintain all silt fences ~~immediately after each rainfall and at least daily during prolonged rainfall~~in accordance with all applicable permits and the site specific Stormwater Pollution Prevention Plan (SWPPP). The contractor shall immediately correct any deficiencies. The contractor shall also make a daily review of the location of silt fences in areas where construction activities have altered the natural contour and drainage runoff to ensure that the silt fences are properly located for effectiveness. Where deficiencies exist as determined by the Qualified Person or Environmental Monitor,~~engineer,~~ additional silt fence shall be installed as necessary and as directed by the E~~e~~ngineer. Accumulation of sediment along the silt fence indicates inadequate protection of upslope disturbed ground. When this is observed, corrective action shall be taken to reduce erosion. When the sediment deposits reach a depth of six (6) inches sediment shall be removed. Also, remedial BMP measures shall be implemented as red-line changes to the SWPPP to prevent erosion above the silt fence. The cost of sediment removal is incidental to Silt Fence. Remedial BMP's shall be paid in accordance with the provisions of the contract.~~When the sediment deposits reaches half the height of the fence the sediment shall be removed or a second silt fence shall be installed as directed by the engineer. The cost of this work shall be paid as "Sediment Removal" or "Silt Fence".~~

The silt fence shall remain in place until the E~~e~~ngineer directs it ~~be~~to be removed. Upon removal the contractor shall remove and dispose of any excess sediment accumulations~~, dress the area to give it a pleasing appearance~~, and vegetate all bare areas. Removed silt fence may be used at other locations provided the geotextile and other material requirements continue to be met to the satisfaction of the E~~e~~ngineer.

Silt fence material shall be selected from the WVDOH Approved Products List for Engineering Fabric for Sediment Control (Silt Fence). Longer duration projects will require stronger silt fence materials with greater UV stability in accordance with the following table.

Silt Fence Application Table

	ASTM Standard	Temporary	Standard	High Performance
Application	n/a	1 construction season	2 construction seasons	Longer projects and challenging situations
Grab Strength Machine Direction (lb)	D-4632	120	280	400
Maximum Elongation (%)	D-4632	50	50	50

Min. Permittivity (sec^{-1})	D-4491	0.05	0.05	0.05
Max. Apparent opening size (mm)	D-4751	0.6	0.6	0.6
UV Stability (%)	D-4355	70	80	90

Refer to the following table for post spacing

Max. Post Spacing (ft)		
	16" high fence	24" high fence
Steel T-post		
0.95#/ft	5	3
1.25#/ft	6	4
1.33#/ft	7	5
Wood stakes		
1-1/4" x 1-3/4"	6	4
1-3/4" x 1-3/4"	6	4

Longer and steeper slopes require multiple rows of silt fence for effective protection. Add rows of silt fence in accordance with the following table.

Maximum Slope Length Above Silt Fence		
Slope		Slope Length (ft)
0% - 2%	Flatter than 50:1	250
2% - 10%	50:1 - 10:1	125
10% - 20%	10:1 - 5:1	100
20% - 33%	5:1 - 3:1	75
33% - 50%	3:1 - 2:1	50

642.9-PAY ITEMS:

ADD THE FOLLOWING TO THE TABLE:

ITEM	DESCRIPTION	UNIT
642011-*	Temporary Silt Fence	Linear Foot
642012-*	Standard Silt Fence	Linear Foot
642013-*	High Strength Silt Fence	Linear Foot

*Sequence number

DRAFT

~~January 1, 2023~~ January 1, 2026

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 642
TEMPORARY PLLUTION CONTROL

NOTE: This table will be posted at :
https://transportation.wv.gov/highways/TechnicalSupport/specifications/642.7UnitValueMethod/Pages/default.aspx/
(this link will be revised prior to publication of 2026 Supplemental Specifications).

642.7-METHOD OF MEASUREMENT:

ADD THE FOLLOWING:

TABLE 642.7.1 – Pollution Control Device Rate Schedule

Description	(Item)	Unit	Value per Unit	Specification Note 2
Temporary Berm	(642001-001)	LF	2	Yes
Slope Drain	(642002-001)	LF	21	Yes
Seed Mixture, Temporary	(642004-001)	LB	2	Yes
Seed Mixture, B	(642004-002)	LB	5	Yes
Seed Mixture, D	(642004-003)	LB	20	Yes
Seed Mixture, L	(642004-004)	LB	18	Yes
Mulch, Straw or Hay	(642005-001)	TN	450	Yes
Mulch, Wood Cellulose Fiber	(642005-002)	TN	2,500	Yes
Mulch	(642005-003)	TN	2,500	Yes
Hydraulic Erosion Control Product, function longevity (1 to < 6 months)		LB	1	-
Hydraulic Erosion Control Product, function longevity (> 6 months)		LB	1	-
Hydraulically Applied Polymers		LB	1	-
Biotic Soil Amendment		LB	1	-
Fertilizer	(642006-001)	TN	850	Yes
Fiber Matting	(642007-001)	SY	2	Yes
Temporary Pipe	(642008-001)	LF	73	Yes
Contour Ditch	(642009-001)	LF	2	Yes
Agricultural Limestone	(642010-001)	TN	68	Yes
Wattle, ≥ 8 IN		LF	12	-

TABLE 642.7.1 – Pollution Control Device Rate Schedule

Description	(Item)	Unit	Value per Unit	Specification Note 2
Silt Fence	(642012-001)	LF	4	Yes
Super Silt Fence	(642015-001)	LF	10	Yes
SMARTFence, 36 IN		LF	5	-
SMARTFence, 42 IN		LF	10	-
Simplified Diversion Fence		LF	5	-
Compost Filter Sock, 8 IN	(642016-001)	LF	7	SP
Compost Filter Sock, 12 IN	(642016-002)	LF	8	SP
Compost Filter Sock, 18 IN	(642016-003)	LF	9	SP
Compost Filter Sock, 24 IN	(642016-004)	LF	10	SP
Compost Filter Sock, 32 IN	(642016-005)	LF	11	SP
Rock Check Dam	(642031-001)	EA	93	Yes
Sediment Trap	(642033-001)	CY	17	Yes
Sediment Basin	(642034-001)	CY	17	Yes
Riser	(642035-001)	EA	9,000	Yes
Skimmer	(642035-002)	EA	2,800	SP
Sediment Removal	(642036-001)	CY	7	Yes
Inlet Protection	(642040-001)	EA	270	Yes
Flocculant Block	(642042-001)	EA	180	SP
Polyacrylamide		LB	1	-
Premanufactured Ditch Check	(642043-001)	EA	67	-
Turbidity Curtain	(642045-002)	FT	100	SP
Coir Baffles		LF	9	-
Dewatering Device	(642050-001)	EA	720	Yes
Erosion Control Matting	(642055-001)	SY	2	-
Coconut Matting		SY	4	-
Non-Woven Geotextile Fabric		SY	3	-
Rock Borrow Excavation	(211008-000)	TN	75	Yes
Impervious Core	(211017-001)	SF	4	Yes
~~Seed Mixture, B, C-1, or C-2~~	~~(652003-001)~~	~~LB~~	~~20~~	~~Yes~~
~~Seed Mixture, D~~	~~(652003-002)~~	~~LB~~	~~20~~	~~Yes~~
~~Mulch, Straw or Hay~~	~~(652004-001)~~	~~TN~~	~~450~~	~~Yes~~
~~Mulch, Wood Cellulose Fiber~~	~~(652004-002)~~	~~TN~~	~~850~~	~~Yes~~
~~Fertilizer, 10-20-10~~	~~(652002-001)~~	~~TN~~	~~500~~	~~Yes~~
~~Fertilizer, Urea Formaldehyde~~	~~(652002-002)~~	~~TN~~	~~60~~	~~Yes~~
Tied Concrete Block Mattress	(655002-002)	SY	90	SP

Note 1: Units are calculated by multiplying the quantity of temporary pollution control devices installed on project by the rate value.

Example: 175 lbs of "Seed Mixture, Temporary" X 2 = 350 Units

Note 2 Items not covered by WVDOH Specification or Special Provision (SP) shall be handled and installed according to the manufacturer's recommendations.

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~~February 11, 2025~~ April 3, 2025

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 601
STUCTURAL CONCRETE

601.1–DESCRIPTION:

ADD THE FOLLOWING:

Class M concrete shall be used to produce less heat of hydration and intended for use in large concrete bridge substructure elements including pier stems, pier caps, footers, and abutments.

601.2–MATERIALS:

ADD THE FOLLOWING AFTER "Class H Concrete Requirements":

Class M Concrete Requirements: All coarse aggregate used in Class M concrete shall be limestone. River, manufactured silica , or limestone sand shall be used as fine aggregate in Class M concrete. Slag cement used in Class M concrete shall be Grade 100 or Grade 120. Fly ash used in Class M concrete shall be Class F. Sources of each type of supplemental cementitious material (SCM) shall be approved by the Engineer. Multiple sources of the same type of supplem~~ntal~~entary cementitious material shall not be permitted.

601.3–PROPORTIONING:

601.3.1-Mix Design Requirements:

ADD CLASS "M" CONCRETE AND UPDATE THE FIRST FOOTNOTE TO TABLE 601.3.1A:

TABLE 601.3.1A

Class of Concrete	Design 28 Day Compressive Strength	Target Cement Factor	Maximum Water Content	Standard Size of Coarse Aggregate***	Entrained Air
	Pounds per Square inch	lbs./c.y.*	lb. of water / lb. of cement **	Number	Percent

M	3500	See Table 601.3.1E	0.42	57, 67	6.0

* An equal mass of a SCM may be substituted for Portland cement up to the maximum amount in Table 601.3.1B. Only one SCM is permitted in a mix design, except for Class H concrete. The target cement factor of Class H concrete shall consist of Option 1 or Option 2 from Table 601.3.1C. The target cement factor of Class M concrete shall consist of Option 1, Option 2, or Option 3 from Table 601.3.1F. The Contractor may choose either option.

ADD THE FOLLOWING TO TABLE 601.3.1B:

TABLE 601.3.1B

Material	Class of Concrete	Quantity
Fly Ash	All Classes Except H and M	20%

ADD THE FOLLOWING TABLE TO SUBSECTION:

TABLE 601.3.1F

Option	Cement	Fly Ash	Slag Cement	Silica Fume
1	564 lb/c.y.			
2	254 lb/c.y.		254 lb/c.y.	
3	340 lb/c.y.	168 lb/c.y		

601.3.2-Field Tolerances and Adjustments:

601.3.2.2-Air Content:

REMOVE AND REPLACE THE 2nd PARAGRAPH IN SUBSECTION 601.3.2.2 WITH THE FOLLOWING:

The target of the entrained air content of Class H and Class M concrete at the time of placement shall be as shown in Table 601.3.1A. If the concrete is pumped, the air content shall be measured before the concrete pump. If the entrained air does not conform with the target value within plus or minus 1.5 percentage points, the Contractor shall take immediate steps to adjust the air content of succeeding loads by making necessary adjustments in the mixture. If the entrained air content of Class H and Class M concrete does not conform to the target value plus 2.0 percentage points, the concrete shall be rejected. When Class H and Class M concrete is delivered in a truck mixer and the air content is less than the target value minus 2.0 percentage points, the concrete shall be rejected or the Contractor may use an additional air-entraining agent in an amount that is intended to achieve the target value specified. The addition is permitted under the conditions listed below.

ADD THE FOLLOWING SUBSECTION:

601.3.3-Class M Mix Development: The chemical reaction of cement and water releases heat which can cause detrimental thermal cracking in large concrete structures. To prevent thermal cracking, Class M concrete shall obtain minimum strength in accordance with 601.3.3.1. The Division will approve Supplementary Cementitious Materials, admixtures, and

Cements based on their chemical, and thermal properties for Class M concrete during mix design approval.

601.3.3.1–Tests for Strength Acceptance of Class M Concrete: Class M concrete shall obtain a minimum 1-day and 3-day strength shown in Table 601.3.3.1.

TABLE 601.3.3.1

Minimum Compressive Strength of Class M Concrete			
Testing Age	Option 1	Option 2	Option 3
1-Day	1580 psi (10.9 MPa)	710 psi (4.9 MPa)	1010 psi (6.9 MPa)
3-Day	2700 psi (18.6 MPa)	1680 psi (11.6 MPa)	1810 psi (12.5 MPa)

A strength test shall consist of three test specimens. Specimens shall be cured in a water bath at 73.5 ± 3.5 °F. The test shall be the average of the three specimens, except if one specimen shows manifest evidence of improper sampling, molding, or testing, it shall be discarded, and the remaining two strengths averaged. Should more than one specimen representing a given test show definite defects due to improper sampling, molding, or testing, the entire test shall be discarded. The maximum acceptable range of compressive strengths within a set of three cylinders is 9.5%. This range is found by multiplying 9.5% times the average compressive strength of the three cylinders. If this acceptable range is exceeded, the cylinder that varies the most from the average shall be discarded, and the remaining two cylinders shall be evaluated as outlined in the following paragraph. The maximum acceptable range of compressive strengths within a set of two cylinders is 8.0%. This range is found by multiplying 8.0% times the average compressive strength of the two cylinders. If this acceptable range is exceeded, the entire test shall be discarded. Under no circumstances shall a compressive strength test consist of less than the average of two specimens.

601.4–TESTING:

601.4.1–Sampling and Testing Methods:

ADD THE FOLLOWING TO THE TABLE:

~~Splitting tensile strength of cylindrical concrete specimens~~	~~AASHTO T 198~~

601.8–FORMS:

601.8.7-Removal of Forms and Construction of Superimposed Elements:

ADD THE FOLLOWING PARAGRAPH AT THE END OF SUBSECTION 601.8.7:

Concrete elements cast with Class M or Class B concrete shall have forms remain in place for a minimum of 96 hours. Insulated concrete elements with Class M concrete shall follow 601.8.11. Insulated concrete elements with Class B concrete shall have forms remain in place for a minimum of 11 days.

ADD THE FOLLOWING SUBSECTION:

601.8.11–Removal of Form Insulation of Class M Concrete: Insulated forms shall remain in place for a minimum of 96 hours. The insulation may be removed when the temperature difference between the concrete surface and the lowest daily ambient temperature is less than 40 °F after 96 hours. The lowest forecast ambient temperature during the week of formwork removal shall be used as the lowest daily ambient temperature. The concrete surface temperature measurement shall be taken before exposing the concrete surface to the ambient temperature. The concrete surface temperature may be measured using an embedded temperature sensor 2-in from the concrete surface at the center of the side face closest to the center of the element. In the absence of an embedded temperature sensor, other approved temperature devices may be used to measure the concrete side face temperature closest to the center of the element. In lieu of concrete surface temperature measurements, the form insulation removal time for an R = 5 insulation in an ambient temperature ranging from 60 °F to 30 °F is shown in Table 601.8.11. Ambient temperature outside the 60 °F to 30 °F range requires a temperature sensor. The actual minimum dimension shall be rounded up to the nearest tabulated minimum dimension. If the minimum dimension exceeds the minimum dimension tabulated in Table 601.8.11, the structure shall be designated as mass concrete and require a thermal control plan meeting the requirements in 601.9.3.5. Concrete placement outside the 60 °F to 30 °F temperature range and without an embedded temperature sensor specified above shall meet 601.12.2 requirement for insulation removal: "When protection is removed from the structure after the specified curing is complete, the temperature of the concrete shall not be permitted to fall at a greater rate than 20 ˚F per 24-hrs." The specified curing for these cases shall be at least 7-days. Additionally, the temperature difference between the concrete surface and the lowest daily ambient temperature shall not be greater than 40°F.

TABLE 601.8.11

Form Insulation Removal Times (Class M concrete with R = 5 Insulation)					
Type	Cross-Section	Minimum Dimension (ft)	Class M Concrete: Option 1	Class M Concrete: Option 2	Class M Concrete: Option 3
Pier Stem	Circular	6 or less	288-hrs	216-hrs	192-hrs
		7	See 601.9.3.5	240-hrs	240-hrs
		8	See 601.9.3.5	288-hrs	288-hrs
	Square	3.5 or less	168-hrs	168-hrs	144-hrs
		4.5	264-hrs	216-hrs	216-hrs
		5.5	See 601.9.3.5	288-hrs	264-hrs
	Rectangular	2 or less	144-hrs	120-hrs	120-hrs
		3	240-hrs	192-hrs	192-hrs
		4	See 601.9.3.5	288-hrs	288-hrs
Pier Cap		5 or less	228-hrs	192-hrs	204-hrs

	Hammerhead (Less than 14-ft in width and less than 5-ft in height)	6	See 601.9.3.5	216-hrs	240-hrs
		7	See 601.9.3.5	240-hrs	See 601.9.3.5
	Hammerhead (Less than 36-ft in width and less than 10-ft in height)	2.5 or less	180-hrs	180-hrs	192-hrs
		3	240-hrs	216-hrs	228-hrs
		3.5	See 601.9.3.5	240-hrs	240-hrs
	Two-column pier cap (Less than 23-ft in span, and less than 5-ft in height)	3 or less	264-hrs	204-hrs	240-hrs
		3.5	See 601.9.3.5	240-hrs	See 601.9.3.5
		4	See 601.9.3.5	264-hrs	See 601.9.3.5
	Three-column pier cap (Less than 16-ft in each span, and less than 5-ft in height)	3 or less	240-hrs	144-hrs	192-hrs
		4	See 601.9.3.5	216-hrs	See 601.9.3.5
		5	See 601.9.3.5	240-hrs	See 601.9.3.5
Rectangular Footer (Thickness = H x Width x Length)	H X 3H X 4H	3 or less	240-hrs	144-hrs	144-hrs
		3.5	See 601.9.3.5	192-hrs	240-hrs
		4	See 601.9.3.5	240-hrs	See 601.9.3.5
	H X 4H X 4H	2.5 or less	96-hrs	96-hrs	120-hrs
		3	240-hrs	168-hrs	192-hrs
		3.5	See 601.9.3.5	240-hrs	240-hrs
	H X 4H X 5H	2.5 or less	96-hrs	120-hrs	120-hrs
		3	240-hrs	168-hrs	240-hrs
		3.5	See 601.9.3.5	240-hrs	See 601.9.3.5
	H X 4H X 36	2.5 or less	240-hrs	240-hrs	240-hrs
		3	See 601.9.3.5	264-hrs	See 601.9.3.5

601.9 ~~MASS CONCRETE~~TEMPERATURE CONTROL:

601.9.1–Cold Weather Concreting:

ADD THE FOLLOWING TO THE END OF THE SUBSECTION:

Class M Concrete Cold Weather Provisions: Cold weather periods shall be defined as those periods when temperatures above 50 °F do not occur for more than half of any 24-hour

duration. The temperature of the surface on which the concrete is to be placed shall not be less than 40 °F immediately prior to the placement of the concrete. During the cold weather periods, as defined above, the temperature of the concrete immediately after placement shall be between 50 °F to 65 °F

ADD THE FOLLOWING CONTENT AS A NEW SUBSECTION:

601.9.3-Mass Concrete:

~~601.9.3.1 General:~~ Mass concrete is defined as "Any large volume of cast-in-place concrete with dimensions large enough to require measures to be taken to cope with the generation of heat and attendant volume changes to minimize cracking". A concrete element's dimensions will be classified as mass concrete when the early-age tensile stresses exceed 80% of the tensile strength. Rock socketed drilled shafts shall not be classified as mass concrete.

~~This section describes the requirements for concrete used in mass concrete elements and is intended to produce structures free of thermal cracks caused by the heat of hydration during the curing of large concrete cross-sections. This is accomplished by using appropriate mix designs, cross-section, and managing the structure's temperature differential. This section does not apply to rock socketed drilled shafts.~~ Concrete pier stems, pier caps, footers, and abutments shall be considered mass concrete if they exceed the dimensions in Section 601.9.3.1.1~~2~~, Section 601.9.3.1.2, and Section 601.9.3.1.3~~4~~, respectively.

Compensation for conforming to these requirements will be at no additional cost and shall be included in Pay Items for individual elements identified in the plans.

601.9.3.1.~~1 Requirements for~~Requiremnts for Miscellaneous Mass Concrete ~~Mass Definition Tables~~: Tables in Section 601.9.3.1.1~~601.9.2~~, Section 601.9.3.1.2~~601.9.3~~ and Section 601.9.3.1.3~~601.9.4~~ shall be cast with Class M and Class B concrete meeting the requirements in Table 601.3.1A, Table 601.3.1B, and Table 601.3.1F. The placement temperature of a concrete element shall meet the requirements of 601.10.1.4. Concrete forms for non-insulated concrete elements shall remain in place for a minimum of ninety-six (96) hours. Concrete shall be cured following 601.12.1. When insulation is not used, a plastic sheet shall cover the concrete forms to protect the concrete element from excessive wind. Tables labeled as "non-insulated" shall only be used in ambient temperatures above 60 °F. Ambient temperature below the 60 °F range shall require insulation. Insulated concrete elements shall have insulated formworks or blankets with a minimum overall R-value of five (5). The insulation shall remain in place until the requirements in 601.8.11 are met for Class M concrete and the requirements in 601.8.7 are met for Class B concrete.

601.9.3.1.1-Pier Stems: Pier stems with minimum dimensions per Table 601.9.3.1.1 – Table 601.9.3.1.6 shall be designated as mass concrete and require a thermal control plan meeting the requirements in 601.9.3.5.

TABLE 601.9.3.1.1

Class M Option 1 (Non-Insulated)	
Geometry	**Minimum Cross-Section**

Circular	**≥ 3.5 ft**
Square	**≥2.5 ft**
Rectangular	**≥1.5 ft**

TABLE 601.9.3.1.2

Class M Option 1 (Insulated R≥5)	
Geometry	**Minimum Cross-Section**
Circular	**≥ 6.0 ft**
Square	**≥4.5 ft**
Rectangular	**≥3.0 ft**

TABLE 601.9.3.1.3

Class M Option 2 & 3	
Geometry	**Minimum Cross-Section**
Circular	**≥ 4.5 ft**
Square	**≥3.0 ft**
Rectangular	**≥2.0 ft**

TABLE 601.9.3.1.4

Class M Option 2 & 3 (Insulated R≥5)	
Geometry	**Minimum Cross-Section**
Circular	**≥ 8.0 ft**
Square	**≥5.5 ft**
Rectangular	**≥4.0 ft**

TABLE 601.9.3.1.5

Class B (Non-Insulated)	
Geometry	**Minimum Cross-Section**
Circular	**≥ 3.0 ft**
Square	**≥2.0 ft**
Rectangular	**≥1.5 ft**

TABLE 601.9.3.1.6

Class B (Insulated R≥5)	
Geometry	**Minimum Cross-Section**
Circular	**≥ 5.5 ft**
Square	**≥4.0 ft**
Rectangular	**≥2.5 ft**

601.9.3.2~~3~~-Pier Caps: Pier caps with minimum dimensions (W) per Table 601.9.3.2.1 — Table 601.9.3.2.6 shall be designated as mass concrete and require a thermal control plan meeting the requirements in 601.9.3.5. A hammerhead type pier cap with less than 14-ft in width and less than 5-ft in height shall be treated as a “14-ft Hammerhead”. A hammerhead type pier cap with less than 36-ft in width and less than 10-ft in height shall be treated as a “36-ft hammerhead”. “Two-column” pier cap shall have the span of less

than 23-ft, and height of less than 5-ft. "Three-column" pier cap shall have the span of less than 16-ft, and height of less than 5-ft. A schematic drawing of a hammerhead, a two-column and a three-column pier cap is shown in Figure 601.9.3.2A.

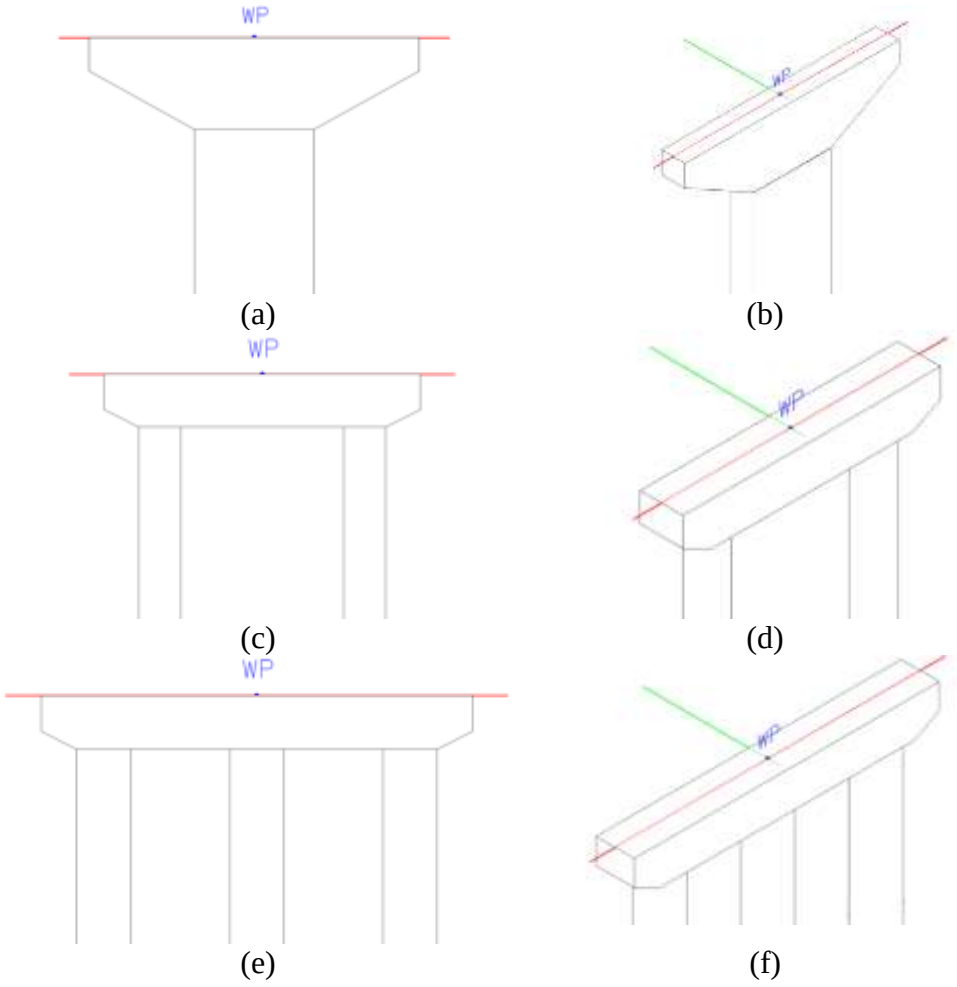

Figure 601.9.3.2A: Schematic drawing of a hammerhead pier cap (a) front view (b) isometric view, a two-column pier cap (c) front view (d) isometric view, a three-column pier cap (e) front view (f) isometric view.

Detailed dimensions of each pier cap type are shown in TABLE 601.9.3.2. A schematic of the pier cap geometry and the parameters used in TABLE 601.9.3.2 are shown in Figure 601.9.3.2B. The dimensions shown in TABLE 601.9.3.2 remain the same and only the thickness 'W' changes.

TABLE 601.9.3.2

Types	~~**L (ft)**~~ ~~**H (ft)**~~ ~~**HM (ft)**~~

	~~LD and RD (ft)~~Pier Cap Dimensions			
	L (ft)	H (ft)	HM (ft)	LD and RD (ft)
Hammerhead (14ft)	14	5	3.5	3.5
Hammerhead (36ft)	36	10	3.625	11.5
Two-Column Pier Cap (30ft)	30	5	3.333	3.3
Three-Column Pier Cap (40ft)	40	5	3.333	3.3

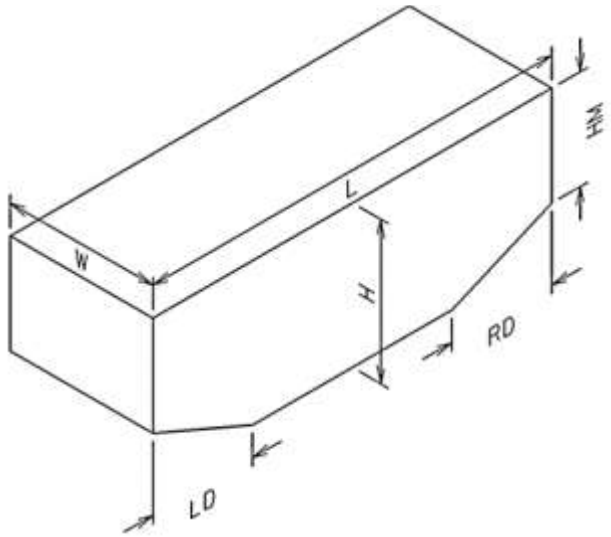

Figure 601.9.3.2B: Pier Cap Geometry

TABLE 601.9.3.2.1

Class M Option 1 (Non-Insulated)	
Geometry	**Minimum Cross-Section**
14 ft Hammerhead	**≥ 2.0 ft**
36 ft Hammerhead	
Two-Column	
Three-Column	

TABLE 601.9.3.2.2

Class M Option 1 (Insulated R≥5)	
Geometry	**Minimum Cross-Section**
14 ft Hammerhead	**≥ 5.0 ft**
36 ft Hammerhead	**≥3.0 ft**
Two-Column	**≥2.5 ft**
Three-Column	**≥3.0 ft**

TABLE 601.9.3.2.3

Class M Option 2 & 3 (Non-Insulated)	
Geometry	**Minimum Cross-Section**
14 ft Hammerhead	**≥ 2.5 ft**
36 ft Hammerhead	
Two-Column	

Three-Column	

TABLE 601.9.3.2.4

Class M Option 2 & 3 (Insulated R≥5)	
Geometry	**Minimum Cross-Section**
14 ft Hammerhead	**≥ 6.0 ft**
36 ft Hammerhead	**≥3.5 ft**
Two-Column	**≥3.0 ft**
Three-Column	**≥3.5 ft**

TABLE 601.9.3.2.5

Class B (Non-Insulated)	
Geometry	**Minimum Cross-Section**
14 ft Hammerhead	**≥ 2.0 ft**
36 ft Hammerhead	
Two-Column	
Three-Column	

TABLE 601.9.3.2.6

Class B (Insulated R≥5)	
Geometry	**Minimum Cross-Section**
14 ft Hammerhead	**≥ 4.5 ft**
36 ft Hammerhead	**≥2.5 ft**
Two-Column	**≥2.0 ft**
Three-Column	**≥2.5 ft**

601.9.3.3 ~~3.4~~-Footers: Footers with minimum dimensions per Table 601.9.3.3.1 – Table 601.9.3.3.6 shall be designated as mass concrete and require a thermal control plan meeting the requirements in 601.9.3.5. "H" in the tables shall be referred to as the minimum dimension in thickness. The actual minimum dimension shall be rounded up to the nearest tabulated minimum dimension.

TABLE 601.9.3.3.1

Class M Option 1 (Non-Insulated)	
Geometry	**Minimum Cross-Section**
H x 3H x 4H	**≥ 2.5 ft**
H x 4H x 4H	
H x 4H x 5H	
H x 4H x 36	

TABLE 601.9.3.3.2

Class M Option 1 (Insulated R≥5)	
Geometry	**Minimum Cross-Section**
H x 3H x 4H	**≥ 3.0 ft**
H x 4H x 4H	
H x 4H x 5H	

H x 4H x 36	**≥2.5 ft**

TABLE 601.9.3.3.3

Class M Option 2 & 3 (Non-Insulated)	
Geometry	**Minimum Cross-Section**
H x 3H x 4H	**≥ 3.0 ft**
H x 4H x 4H	
H x 4H x 5H	
H x 4H x 36	**≥2.5 ft**

TABLE 601.9.3.3.4

Class M Option 2 & 3 (Insulated R≥5)	
Geometry	**Minimum Cross-Section**
H x 3H x 4H	**≥ 3.5 ft**
H x 4H x 4H	
H x 4H x 5H	**≥ 3.0 ft**
H x 4H x 36	**≥2.5 ft**

TABLE 601.9.3.3.5

Class B (Non-Insulated)	
Geometry	**Minimum Cross-Section**
H x 3H x 4H	**≥ 2.0 ft**
H x 4H x 4H	
H x 4H x 5H	
H x 4H x 36	

TABLE 601.9.3.3.3

Class M Option 2 & 3 (Insulated R≥5)	
Geometry	**Minimum Cross-Section**
H x 3H x 4H	**≥ 2.5 ft**
H x 4H x 4H	
H x 4H x 5H	
H x 4H x 36	**≥2.0 ft**

601.9.3.5-Thermal Control Plan: When it is determined that a Thermal Control Plan is required, as outlined in Section 601.9.2, the following provisions shall apply. The Thermal Control Plan shall describe the measures and procedures the Contractor intends to use to satisfy the following Temperature Control Requirements for each mass concrete element.

i. The Maximum Allowable Temperature Differential shall be limited to 35 °F. The temperature differential between the hottest interior location and exterior portions of the designated mass concrete elements during curing will be maintained to be less than or equal to this Maximum Allowable Temperature Differential, and

ii. The Maximum Allowable Concrete Temperature shall be limited to 160 °F.

A change to the Temperature Control Requirements specified above can be addressed in the Thermal Control Plan through a demonstration that deleterious effects to the concrete can be avoided through adherence to the Thermal Control Plan. Such a change requires approval by the Engineer.

As a minimum, the Thermal Control Plan shall include the following:

A. Mix Design.
B. Methodology used to determine the heat of hydration.
C. Duration and method of curing.
D. Methods of controlling maximum concrete temperature and temperature differentials.
E. An analysis of the anticipated thermal developments in the mass concrete elements for all expected project temperature ranges using the proposed mix design, casting procedure, and materials. It shall show complete details and determine the maximum allowable temperature differentials between the hottest point of the concrete and the exterior faces.
F. Temperature sensor type and location including installation details.
G. Temperature Monitoring System includes description, operating plan, recording, and reporting plan, and remedial action plan.
H. Field measures to ensure conformance with the maximum concrete temperature and temperature differential requirements.
I. Field methods of applying immediate corrective action should the temperature differential approach the Maximum Allowable Temperature Differential.

The Contractor shall submit the Thermal Control Plan to the Engineer for approval a minimum of thirty (30) working days prior to concrete placement. Mass concrete placement shall not begin until the Engineer has accepted the Thermal Control Plan and the demonstration placement has verified the accuracy of the temperature predictions. If the demonstration placement fails to verify the accuracy of the temperature predictions to the satisfaction of the Engineer, the Thermal Control Plan shall be revised and resubmitted. If necessary, a second demonstration placement shall be required by the Engineer.

601.9.3.5.1–Temperature Monitoring System: The temperature monitoring and recording system for mass concrete shall consist of temperature sensors connected to a data acquisition system capable of printing, storing, and downloading data to a computer. Temperature sensors shall be located such that the maximum temperature difference within a mass concrete element can be monitored. As a minimum, concrete temperatures shall be monitored: within 1 inch of the calculated hottest location, an outside vertical edge of the outer face that is furthest from the center of the element, and at both the center and an outside edge of the top surface. No temperature sensor shall be placed within the clear distance between the reinforcing steel and the outer concrete surface

Temperature readings shall be automatically recorded on an hourly or more frequent basis. A redundant set of sensors shall be installed near the primary set. Provision shall be made for recording the redundant set, but records of the redundant sensors need not be made if the primary set is operational.

Methods of concrete consolidation shall prevent damage to the temperature monitoring and recording system. Wiring from temperature sensors cast into the concrete shall be

protected to prevent movement. Wire runs shall be kept as short as possible. The ends of the temperature sensors shall not come into contact with either supports or concrete form or reinforcing steel.

When any equipment used in the temperature control and monitoring and recording system fails during the mass concrete construction operation, the Contractor shall take immediate remedial measures to correct the situation. Remedial measures shall be included in the Thermal Control Plan.

601.9.3.5.2–Construction: Temperature readings will begin immediately after casting is complete. Temperature reading will continue until the maximum temperature differential (not maximum temperature) is reached and a decreasing temperature differential is confirmed as defined in the Thermal Control Plan and the maximum concrete temperature is within the Maximum Allowable Temperature Differential of the ambient air temperature in the shade. Data shall be submitted to the Engineer daily.

601.9.3.5.3-Temperature Control Failure: If monitoring indicates the Temperature Control Requirements have been exceeded, the Contractor shall take immediate corrective action as defined in the Thermal Control Plan. The Contractor will provide all analyses and test results deemed necessary by the Engineer for determining the structural integrity and durability of the mass concrete element. If, in the sole opinion of the Engineer, the concrete placement has been damaged so as not to be serviceable as a result of exceeding the Temperature Control Requirements, then the Contractor shall remove and replace the concrete placement at no additional cost to the project. The Contractor will make the necessary revisions to the approved Thermal Control Plan to satisfy the Temperature Control Requirements on any remaining placements. Revisions to the approved plan must be approved by the Engineer prior to implementation. The revised plan will be used on future placements. No extension of time or compensation will be made for any rejected mass concrete element or revisions of the Thermal Control Plan.

If the monitoring indicates that the Temperature Control Requirements have been exceeded then a penalty shall be assessed for bullets (i) and (ii) above in 601.9.3.5 if the concrete is allowed to remain in place, independently as follows:

$~~100~~?/ °F or fraction there-of the allowable temperature range multiplied by the number of yards in the element.

601.10–PLACING CONCRETE:

601.10.1–General:

ADD THE FOLLOWING SUBSECTION:

601.10.1.4–Class M Concrete Placement Limitations: The maximum concrete placement temperature of Class M concrete shall not exceed 75 °F. Class M concrete shall not be used in cold weather placements, as defined in 601.9.1, without form insulation. The anticipated placement completion time of non-insulated Class M concrete shall be between 12:00 AM to 10:00 AM.

601.12–CURING AND PROTECTING CONCRETE:

601.12.1–Curing Under Normal Conditions:

DELETE THE SECOND PARAGRAPH IN THE SUBSECTION AND REPLACE WITH THE FOLLOWING:

Concrete surfaces shall be kept completely and continuously moist. Curing shall be continued for a period of at least seven (7) days. This curing period may be reduced if the contractor presents evidence that the in-place concrete has attained 70% of the specified strength for the class of concrete under cure. Under no circumstances shall the period of cure be less than three (3) days. The reduced curing period option does not apply to Class H, Class K, or Class M concrete. When placing concrete elements with a minimum dimension greater than two (2)- feet ~~(0.61 m))~~, the contractor shall not be permitted to add additional cement to the target cement factor in the approved mix design to obtain high-early strength and/or reduce curing time. Water spreading directly on the concrete surface shall not be permitted for concrete elements with a minimum dimension greater than 1.5-feet. Plastic sheets shall be used to protect exposed concrete surfaces from wind and evaporation. Moist burlap shall be placed on the plastic sheets. Mass concrete placement shall be completely protected from exposure to precipitation to prevent cooling of the surface this includes extruding steel reinforcement. Mass concrete placement shall be continuously moist cured for at least seven (7) days. Concrete forms shall be considered to prevent moisture loss for mass concrete placements and be counted as moist curing days. The temperature of any water used for moist curing of concrete shall be controlled to within 10°F of the mean concrete surface temperature. Surfaces may have coverings temporally removed for finishing, but the covering shall be restored as soon as possible. When protection is removed from the structure after the specified curing is complete, the temperature of the concrete shall not be permitted to fall at a greater rate than 20°F per 24- hrs.

DRAFT

~~June 1, 2023~~ ~~June 28, 2023~~August 22, 2025

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 697
SAFETY INSPECTION OF IN-SERVICE BRIDGES DURING CONSTRUCTION

697.1–DESCRIPTION:

The work shall consist of performing all bridge safety inspection requirements of the Federal Highway Administration's current National Bridge Inspection Standards (NBIS) for normally scheduled inspections, temporary structures, and for any structure or portion thereof that utilizes staged construction until the construction project is fully complete. The inspection team leader shall meet the minimum requirements of a team leader as specified by the NBIS, shall be approved by WVDOH Operations Division, and shall be on site during the duration of all inspection activities. Operations Division shall be notified of the times and dates that any field inspection activities will be occurring.

697.1.1–Inspection Requirements for Normally-Scheduled Inspections: A list of upcoming scheduled bridge safety inspections and the respective inspection types required for the existing structure, or any portion(s) of the existing structure that remain(s) open to traffic, shall be noted in the construction plans. Each inspection shall be performed and completed during the month and year as noted in the plans in accordance with the department's requirements for the noted inspection type as described in the current edition of the WVDOH Bridge Inspection Manual. In cases where an inspection and inspection type are scheduled but no portion(s) of the existing structure remain(s) open to traffic, the Pay Item for that particular inspection will be non-performed. An inspection report, in accordance with the WVDOH Bridge Inspection Manual for the given inspection being performed, shall be compiled and submitted to the District Bridge Engineer within ~~sixty (60)~~forty-five (45) calendar days of completing the inspection utilizing the Department's inspection data software. The inspection and the finalized inspection report must meet the approval of WVDOH Operations Division. The District Construction Engineer shall be notified in writing once the inspection report has been finalized and approved by Operations Division.

697.1.2–Inspection Requirements for Temporary Structures: An initial inspection shall be performed immediately prior to opening any temporary structure or portion thereof to public traffic. The initial inspection shall be in accordance with current NBIS requirements and in accordance with the department's requirements for an Initial~~Inventory~~ Inspection as described in the current edition of the WVDOH Bridge Inspection Manual. ~~An~~ A ~~In-Depth~~Hands-On Routine Inspection, in accordance with the WVDOH Bridge Inspection Manual, shall be performed concurrently with the ~~Inventory~~ Initial Inspection. An ~~Inventory~~ Initial Inspection Report and a~~n~~ ~~In-Depth~~Hands-On Routine Inspection Report shall be compiled and submitted to the District Bridge Engineer within ~~sixty (60)~~forty-five (45) calendar days of completing the inspection utilizing the Department's inspection data software. The inspection and the finalized inspection reports must meet the approval of WVDOH Operations Division. The District Construction Engineer shall be notified in writing once the inspection reports have been finalized and approved by Operations Division.

A Bridge Rating Submission in accordance with Design Directive 202, meeting the requirements for Rating by District Bridge Engineer, shall be attached to the ~~Inventory~~ Initial Inspection Report for the temporary structure. It will not be necessary to include a title sheet with a proposed sheet index. However, all other required items listed for the submission shall be supplied. Load rating of the temporary structure will be performed by WVDOH evaluation personnel once the ~~Inventory~~ Initial Inspection Report has been submitted.

If a temporary structure or portion thereof is open to traffic twenty-four (24) months after the inspection date of the initial inspection, a routine inspection shall be performed in accordance with current NBIS requirements and in accordance with the department's requirements for a Routine Inspection as described in the current edition of the WVDOH Bridge Inspection Manual. A Routine Inspection Report shall be compiled and submitted to the District Bridge Engineer within ~~sixty (60)~~forty-five (45) calendar days of completing the inspection utilizing the Department's inspection data software. The inspection and the finalized inspection report must meet the approval of WVDOH Operations Division. The District Construction Engineer shall be notified in writing once the inspection report has been finalized and approved by Operations Division.

In cases where a panel-type bridge is being utilized, such as those bridges manufactured by Mabey, Acrow, or Bailey, a Special Inspection shall be performed at a maximum interval of every six (6) months, beginning at the inspection date of the ~~initial~~ Initial ~~Inventory~~ Inspection, for the entire period that the structure is open to traffic. This inspection shall be in accordance with the WVDOH Bridge Inspection Manual and shall consist of a hands-on inspection of all truss members, connections, pins, and retainer clips. A Special Inspection Report shall be compiled and submitted to the District Bridge Engineer within ~~sixty (60)~~forty-five (45) calendar days of completing the inspection utilizing the Department's inspection data software. The inspection and the finalized inspection report must meet the approval of WVDOH Operations Division. The District Construction Engineer shall be notified in writing once the inspection report has been finalized and approved by Operations Division. If a panel-type bridge is anticipated and a pay item has been included on the project to accommodate the inspection(s), the pay item will be non-performed if a panel-type bridge is not ultimately used.

697.1.3–Inspection Requirements for Structures Utilizing Staged Construction: An initial inspection shall be performed on each individual construction stage immediately prior to opening each stage or portion thereof to public traffic. A revised initial inspection will be

required for each additional phase prior to opening each phase to public traffic. The initial inspection shall be in accordance with current NBIS requirements and in accordance with the department's requirements for an ~~Inventory~~ Initial Inspection as described in the current edition of the WVDOH Bridge Inspection Manual. A~~n~~ ~~In-Depth~~Hands-On Routine Inspection, in accordance with the WVDOH Bridge Inspection Manual, shall be performed concurrently with each ~~Inventory~~ Initial Inspection. A~~n~~ ~~Inventory~~ Initial Inspection Report and a~~n~~ ~~In-Depth~~Hands-On Routine Inspection Report shall be compiled and submitted to the District Bridge Engineer within ~~sixty (60)~~forty-five (45) calendar days of completing the inspection utilizing the Department's inspection data software. The inspection and the finalized inspection reports must meet the approval of WVDOH Operations Division. The District Construction Engineer shall be notified in writing once the inspection reports have been finalized and approved by Operations Division.

If a construction stage, subsequent construction stages, or portions thereof are open to traffic twenty-four (24) months after the inspection date of the most recently performed ~~In-Depth~~Hands-On Routine Inspection, a routine inspection shall be performed in accordance with current NBIS requirements and in accordance with the department's requirements for a Routine Inspection as described in the current edition of the WVDOH Bridge Inspection Manual. A Routine Inspection Report shall be compiled and submitted to the District Bridge Engineer within ~~sixty (60)~~forty-five (45) calendar days of completing the inspection utilizing the Department's inspection data software. The inspection and the finalized inspection report must meet the approval of WVDOH Operations Division. The District Construction Engineer shall be notified in writing once the inspection report has been finalized and approved by Operations Division.

697.2–Blank

697.3–METHOD OF MEASUREMENT:

Bridge safety inspection work will be paid for per each inspection and inspection type performed for each individual bridge or construction stage.

697.4–PENALTIES FOR LATE PERFORMANCE OR NON-PERFORMANCE:

In order for West Virginia to be compliant with the National Bridge Inspection Standards (NBIS), all bridge safety inspections are required to be performed and completed within the given month and year they are due. Therefore, if an inspection is not performed and completed within the month and year it comes due, all work shall be suspended on the project and all payments withheld until the inspection has been fully completed and the complete inspection report has been delivered to the Division. In addition, liquidated damages will be assessed to the Contractor in accordance with the amounts depicted in Section 108.7, beginning with the first day of the subsequent month that the inspection was due until the inspection report is received from the Contractor. If the Division is required to perform the inspection, or hire a separate entity to perform the inspection, the Contractor shall be responsible for all costs incurred by the Department. No extensions shall apply or be applicable for any reason, regardless of extensions that might be given for other work being performed on the project.

697.5–BASIS OF PAYMENT:

Payment for the above described work, including all materials, equipment, labor, and any other incidental work necessary to complete this item, will be considered completely covered by the contract unit price for the item below.

697.6–PAY ITEM:

ITEM	DESCRIPTION	UNIT
697001-*	NBIS Bridge Safety Inspection, “designation”, “type”	Each

* Sequence number
“designation” Bridge, temporary bridge, or stage name designation
“type” Inspection type, typically ~~Inventory~~ Initial Inspection or ~~In Depth~~Hands-On Routine Inspection

Note 1: Each individual bridge inspection should be added as separate line item in project proposal.

Example:
697001-001, NBIS Bridge Safety Inspection, Temporary Bridge, ~~Inventory~~ Initial Inspection, Each
697001-001, NBIS Bridge Safety Inspection, Stage One, ~~In Depth~~Hands-On Routine Inspection, Each

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

ELECTRONIC SUBMISSION OF PAYROLLS AND SUBCONTRACTOR PAYMENTS

1.0-GENERAL REQUIREMENTS:

The Contractor and all subcontractors shall submit ~~all~~ certified payrolls and subcontractor payments for federally funded projects only~~, including those made to Disadvantaged Business Enterprises (DBEs),~~ using the AASHTOWare™ Project (AWP) Civil Rights and Labor (CRL) ~~system~~ module in accordance with this provision. For subcontractor payments, the term "subcontractor" shall include all vendors subject to the Required Contract Provisions Federal-Aid Construction Contracts (FHWA-1273). All subcontracting agreements made by the Contractor shall include this Special Provision.

There will be no direct payment for recording and reporting of this information. All costs associated with this provision shall be considered incidental. More information about the AWP CRL ~~system~~ module can be located at: https://www.aashtowareproject.org/index.php.

2.0-SYSTEM REQUIREMENTS:

The ~~CRL~~ AWP system is web-based. The Contractor shall ensure compatibility with the CRL ~~system~~ module as necessary to successfully execute the work. The CRL ~~system~~ module requires the ability to read, create, and edit spreadsheets in the .xlsx file format.

Contractors with new AWP accounts ~~will be~~ must contact~~ed~~ ~~by~~ the Department's Civil Rights Division after the project is awarded to begin the process for accessing the CRL ~~system~~ module for them and their subcontractors. Contractors must register for payroll access and develop a method of payroll import prior to the Pre-Construction Conference. The Department's Civil Rights ~~Compliance~~ Division will provide training for entry of certified payrolls and subcontractor payments in CRL. Detailed information can be found on the Department's Civil Rights ~~Compliance~~ Division webpage at: https://transportation.wv.gov/crc/Pages/default.aspx

Contractors shall ensure each subcontractor~~, including DBEs,~~ has registered for ~~payroll~~ AWP access and developed their method of payroll import prior to commencing work. ~~The~~ Contractors and subcontractors with new AWP accounts will be granted CRL access after submitting Request Access forms for each individual user who requires an account. Only those

firms with a contract in the system should submit the Request Access form. The software is configured so that each firm can only see their specific contract information. There will only be one single sign-on process for multiple application access within the Department.

The Department will provide access and a log-in identification (ID) for the ~~CRL~~ AWP system to designated employees of the Contractor and approved subcontractors entered into the system for the contract. The login ID and password are unique to the designated employee and must not be shared with other employees. There are no fees associated with accessing the system or receiving a login ID.

3.0-PROCEDURES:

3.1-Certified Payroll and Subcontractor Data Submission: The Contractor and all subcontractors shall use the CRL ~~system~~ module to provide the Department with electronic certified payrolls for federally funded projects only. The Contractor shall assume all responsibility for ensuring all payrolls and all subcontractor payrolls are submitted and certified electronically in CRL for each week in which any contract work is performed. If all payrolls are not received in this timeframe, the progress payment shall be withheld until all necessary payrolls have been received and approved. Electronic submittal of certified payrolls can be submitted using the following methods:

- Manually add, copy, or modify data directly into CRL;
- Import payroll data with the CRL payroll spreadsheet XML converter tool available at https://xml.cloverleaf.net/spreadsheet/;
- Convert payroll system program data to Payroll XML and import it into the CRL system. Information on how to convert to payroll program data to an XML file can be located at https://xml.cloverleaf.net/resourcekit/;
- The Contractor may send, on behalf of a subcontractor, payroll payment information based on a signed, certified paper payroll through the Electronic Proxy Payroll Process. Import payroll data with the CRL payroll spreadsheet XML converter tool available at https://xml.cloverleaf.net/spreadsheet/.

The Department's Civil Rights Compliance Division may require at any time certified paper copies of payrolls conforming to FHWA-1273 from any or all Contractors working on the project.

3.2-Subcontractor Payment Submission Requirements: The Contractor shall ~~post~~ make payment to subcontractors and post such in the CRL module~~, including DBE firms listed on their DBE plan towards meeting their contract DBE goal,~~ within fourteen (14) days after receipt of payment from the ~~Department~~ State. The Contractor shall submit, and shall require each subcontractor to provide, payment amounts relative to all involvement on the project during the life of the contract in which participation occurs and verification is available. The Contractor shall enter all payments made to all subcontractors ~~into the Payment area of CRL~~ for each estimate. The Contractor shall also require all subcontractors to review and endorse receipt of payments in CRL.

Refer to the Special Provision for Subcontractor Prompt Payment for further information regarding subcontractor payments.

The Department's Civil Rights Compliance Division may require at any time proof of payments from any or all subcontractors working on the project~~, including any information related to Contractor DBE payments~~.

SECTION BREAK

NEW BUSINESS ITEMS

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 720
SMOOTHNESS TESTING

720.1-DESCRIPTION:

REMOVE AND REPLACE THE CONTENTS OF THE ENTIRE SUBSECTION WITH THE FOLLOWING:

To measure and evaluate the ride quality of pavement surfaces in accordance with the International Roughness Index (IRI), as well as the most recent forms of AASHTO R-56, AASHTO M328, and AASHTO R-57.

720.2-EQUIPMENT:

720.2.1-High-Speed or Low Speed Inertial Profiler: Provide a high-speed or low speed inertial profiler for measuring and evaluating the ride quality of pavement surfaces. The inertial profiler shall be certified at a facility approved by the Materials Control, Soils and Testing Division (MCS&T). Certification facilities should conduct the evaluation in accordance with the most recent edition of AASHTO R-56 "Standard Practice for Certification of Inertial Profiling Systems". All inertial profilers shall be maintained in accordance with the most recent edition of AASHTO M 328 "Standard Specifications for Inertial Profiler" Calibration and verification shall be done in accordance with MP 720.10.0. The Contractor shall submit equipment certification documentation after becoming certified or after recertification. Proof of equipment certification shall be available upon request.

720.2.2-Inertial Profiler Operator Certification: Certification through the Material Control, Soils and Testing Division shall be required to operate an inertial profiler in the State of West Virginia. The operator shall pass a written exam administered by MCS&T. All operators receiving a passing score on the written exam will be placed on the WVDOH Materials Certification Directory that is found on the MCS&T webpage. Certification shall be for a period of three years. Certified operators shall contact MCS&T for certification renewal.

720.3-RIDE QUALITY TESTING:

720.3.1-~~Quliaty~~ Quality Control (QC) Testing: QC testing on all eligible projects is the responsibility of the Contractor. QC testing is optional, but when performed shall be completed in accordance with MP 720.10.01 Section 8 and shall be completed no later than thirty (30) calendar days after all lanes are continuously open to traffic. Data collection shall be done by a certified inertial profiler and certified inertial profiler operator (See 720.2.1 and 720.2.2). Collected profile data shall be submitted to the DOH MCS&T roadway inbox DOHMCSnTRoadway@wv.gov in accordance with MP 720.10.01 Section 10 within seven (7) calendar days of testing. Price adjustments will be calculated according to Contractor's QC data unless QA testing determines otherwise.

720.3.2-Quality Assurance (QA) Testing: QA testing is the responsibility of the Division. The Engineer shall submit a pavement testing request form to MCS&T to the DOH MCS&T roadway inbox DOHMCSnTRoadway@wv.gov within five (5) calendar days after all lanes are continuously open to traffic. QA testing will be completed in accordance with MP 720.10.01 Section 8 and should be completed no later than thirty (30) calendar days after receiving the pavement testing request from the Contractor, or within 30 calendar days of the Contractor's QC test. In the event QA testing cannot be completed within thirty (30) calendar days of QC testing, price adjustments will be calculated solely based on QC data. If QC testing was not performed, then price adjustments will be calculated solely based on QA data regardless of time frame. The Division will perform testing using a certified inertial profiler and a certified inertial profiler operator in accordance with the most recent edition of AASHTO R 56 " Standard Practice for Certification of Inertial Profiling Systems".

720.3.3-QA Testing Comparison: The Division's profile data and the Contractor's profile data will be compared to determine the IRI differences. Final project price adjustments will be made using the Contractor's profile data if the IRI differences are within the allowable limits outlined in Table 720.3.3. If the QA testing IRI differences do not meet the maximum allowable difference from Table 720.3.3, QA testing data will be used for final price adjustments. This Comparison is only applicable if both profiles are completed within thirty (30) calendar days of each other.

TABLE 720.3.3
QA Testing Allowable IRI Differences

Contractor's IRI Mean (in/mi)	Maximum Allowable Differences
50.0 or Less	8.5% of Contractor's IRI Mean
50.1 to 150.0	6.0% of Contractor's IRI Mean
150.1 or Greater	7.0% of Contractor's IRI Mean

720.3.4-Testing After Repairs: Should repairs be needed to the surface from the defects in the pavement prior to project closeout, QA testing shall be conducted after all repairs are made. This will be the final tested value for the lot.

720.4-RIDE QUALITY ANALYSIS

720.4.1-Data Location: The average IRI number used in ride quality analysis shall be the mean roughness index (MRI) which is the average IRI of both the left and right wheel path. Analysis shall be done in accordance with MP 720.10.01 Section 9.

720.4.2-Omitted Sections: ~~Bridge Structures and any~~ Any sections tested which are not included in the pavement project shall be removed from the Smoothness Analysis. ~~These removed bridges and sections~~These Sections shall also include a Lead-In and Lead-Out distance to be removed from the Ride Quality Analysis. The Lead-In distance shall be two hundred (200) feet and the Lead-Out distance shall be two hundred (200) feet.

720.4.3-Sampling Lots: The pavement shall be divided into sampling lots of one-tenth (0.1) lane mile each. Each Lot shall have a smoothness measurement, expressed in inches per mile (in./mi.).

720.4.3.1-Special Cases for Sampling Lots Less Than One-Tenth (0.1) Lane Mile: In some cases, sampling, lots of one tenth (0.1) lane mile will not be attainable. These cases include areas at the end of the project as well as areas that are before the 'lead in" length of bridges. If these areas are less than five-hundredths (0.05) of a lane mile that will be eliminated from Smoothness analysis. If these areas are more than five-hundredths (0.05 mile) lane mile these areas will be included in analysis and pay adjustments will be prorated to the nearest one hundredth (0.01) mile.

720.5-NATIONAL HIGHWAY SYSTEM (NHS) PAVEMENT PROJECT:

Pavement projects located on any NHS route and greater than 0.2 miles of continuous new pavement shall be tested with a high-speed or low speed inertial profiler certified in accordance with Section 720.2.

720.5.1-Determining National Highway System Routes: The NHS map should be used when determining if a route is on the National Highways System. This tool can be found online at the following link:
https://wvdot.maps.arcgis.com/apps/dashboards/88e87932344946408b7c17f1bd454752

720.5.2-Schedule 1 NHS Pavement Projects: NHS pavement projects with a total new pavement thickness of four (4) inches or greater shall be classified as Schedule 1 NHS Pavement Projects. The final price adjustments for Schedule 1 NHS Pavement Projects shall be determined using the calculations shown in Table 720.5.2.

TABLE 720.5.2
Schedule 1 NHS Pavement Projects

IRI for each 0.1-mile section (in/mi)	Price Adjustment ($)

65.0 or Less	0
65.1 to 95.0	1,300 – 20(IRI)
95.1 or Greater	Corrective Action Required

720.5.2.1-Corrective Action for Schedule 1 NHS Pavement Projects: Corrective action shall be required for Schedule 1 NHS Pavement Projects having an IRI greater than 95.1 in/mi. Corrective action shall be performed using diamond grinding, micro milling, or other work methods approved by the Engineer.

720.5.3-Schedule 2 NHS Pavement Projects: NHS pavement projects with a total new pavement thickness less than four (4) and greater than one (1) inch inches shall be classified as Schedule 2 NHS Pavement Projects. The final price adjustments for Schedule 2 NHS Pavement Projects shall be determined using the calculations shown in Table 720.5.3.

TABLE 720.5.3
Schedule 2 NHS Pavement Projects

IRI for each 0.1-mile section (in/mi)	Price Adjustment ($)
80.0 or Less	0
80.1 to 120.0	1,200 – 15(IRI)
120.1 or Greater	-600

720.6-NON-NATIONAL HIGHWAY SYSTEM PAVEMENT PROJECTS:

Pavement projects located on any Non-NHS routes shall be tested with equipment outlined in 720.2.1, 720.2.2 and 720.3 if the project meets all four of the following requirements:

1. Resurfacing is the primary project type
2. Greater than 1 mile of continuous pavement
3. Edge lines and center line on the new pavement in accordance with Section 663.
4. Thickness of one inch (1) or more of new pavement (including scratch if used)

720.6.1-Ride Quality Analysis Before Project: Non-NHS pavement projects shall be tested before the pavement project begins. Any new construction of a Non-NHS route will be evaluated as an NHS route according to 720.5.

720.6.2-Data Source Collection After Project Completion: The data collection after project completion shall be collected by the Division's high-speed or low speed inertial profiler as referenced in 720.3.2. On non-NHS routes Quality Control Testing is optional for the contractor. If QC testing is performed, it shall follow the process outlined in section 720.3.

720.6.3-Final Price Adjustments for Non-NHS: If the average percent improvement for the entire project is 30.1% or more, no price adjustment will be assessed for the project. If the average percent improvement for the entire project is 30.0% or less, then each 0.1 mile lot that has an IRI of 80.1 or greater, will be penalized based on the following table. Table 720.6.3.

TABLE 720.6.3
Non-NHS Pavement Projects

IRI for each 0.1-mile section (in/mi)	Price Adjustment ($ per 0.1-mile Section)
80.1-170.0	320.4(IRI)
170.1 or Greater	-360

Where:

$$\text{Percent Improvment (\%)} = \frac{\text{Before IRI of Lot} - \text{After IRI of same Lot}}{\text{Before IRI of Lot}} \text{X } 100$$

720.7-TESTING OF BRIDGE DECKS AND APPROACHES

~~b~~ 720.7.1 – PAVEMENTS WITH EXISTING BRIDGES: Profile of new pavements with an existing bridge structure will be taken up to the bridge deck and beyond for 25 feet on each end of the structure. Pay adjustments will be that of the corresponding roadway types located in 720.5 and 720.6.

720.7.2 –INTERSTATE SYSTEM BRIDGE CONSTRUCTION: On new construction or deck replacement on bridges located on Interstate Systems, final testing shall be performed once all wearing courses are in place within the project. Bridges are defined for smoothness testing as 250 feet of entry pavement, entry approach slab, bridge deck, exit approach slab and 250 feet of exit pavement. Smoothness data will be collected in 25 foot sections. The final price adjustment shall be determined using the calculations shown in Table 720.7.2~~nd~~

TABLE 720.7.2
INTERSTATE SYSTEM BRIDGE PROJECTS

IRI for each 25 ft. Section (in/mi)	Price Adjustments ($ per 25 ft) Section
170.0 or Less	0
170.1 to 600.0	27.9(IRI) -4743
600.1 or Greater	Corrective Action

~~.0.0~~

720.7.3-PRICE ADJUSTMENT AND CORRECTIVE ACTION: The sum of the pay adjustment will be made according to Table 720.7.2 based on the localized IRI. The pay adjustments will be based on post completion data. Any section of bridge with an IRI of 600.1 or greater will not be accepted and will require corrective action. For sections above 600.1, the contractor must submit a corrective action work plan with an approved method as mentioned in Section 720.5.2.1.

720.8~~7~~-PROJECTS THAT DO NOT FALL UNDER PREVIOUS CHARACTERIZATIONS:

At the discretion of the Engineer pavement projects not falling into any of the other classifications shall be measured and evaluated for ride quality analysis under the direction of the

Engineer. If recommended by the Engineer this shall be done by the Contractor with a ten (10) foot straightedge. There will not be any pay adjustments based on Smoothness for these projects.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 601
STRUCTURAL CONCRETE

601.1-DESCRIPTION:

ADD THE FOLLOWING AFTER THE TENTH PARAGRAPH IN THE SUBSECTION:

Class S concrete shall be used for bridge decks and other bridge elements when designated in the plans. This mix shall be used to produce a concrete of high durability with low shrinkage potential.

601.2-MATERIALS:

ADD THE FOLLOWING TO THE TABLE:

MATERIAL	SECTION OR SUBSECTION
Expansive Hydraulic Cement	701.5

601.3-PROPORTIONING:

ADD THE FOLLOWING AFTER THE FIFTH PARAGRAPH:

Design mixture testing for Class S concrete shall be in accordance with MP 711.03.23 and shall include air content, slump, compressive strength, surface resistivity, sequential air method (SAM) number, and shrinkage tests. The Contractor shall complete the following tests for mix design acceptance of Class S concrete before mix design submittal and approval:

- **Surface Resistivity-** For establishment of the mixture proportions, specimens for surface resistivity tests shall be made on representative samples prepared and tested in accordance

with AASHTO T 358. A set of three 4-inch x 8-inch cylinders shall be fabricated and moist cured from both of the batches at the minimum cement factor as outlined in Section 4.3.1 ~~3.3~~ of MP 711.03.23, as specified in AASHTO R 39, for 28 days prior to testing, and the results of this test shall not be less than 40 kΩ-cm.

- **SAM number-** For establishment of the mixture proportions, SAM number tests shall be performed on a representative sample from both of the batches at the minimum cement factor as outlined in Section ~~3.3~~4.3.1 of MP 711.03.23. These samples shall be prepared and tested in accordance with AASHTO T 395. The SAM number for both of these samples shall be less than or equal to 0.20.
- **Shrinkage-** For establishment of the mixture proportions with Portland cement, the 28-day drying shrinkage shall not exceed 0.035% based on average of three specimens from a representative sample from one of the batches at the minimum cement factor as outlined in Section 4.3.1 ~~3.3~~ of MP 711.03.23. ~~This sample shall be tested in accordance with ASTM C157. Specimens shall be moist cured for 7 days before beginning the 28-drying shrinkage testing.~~ The time that the specimens are stored in lime-saturated water, specified in Section 10.3 of ASTM C157, shall be 7 days instead of 28 days, including the time in the molds. At the end of that 7 day water storage period, the specimens shall be removed from the lime-saturated water and stored in air, at the conditions specified in Section 5.4.1 of ASTM C157, for an additional 28 days. At the completion of that air storage period, a second comparator reading shall be taken.

  For establishment of the mixture proportions with Expansive hydraulic cement, the 28-day drying shrinkage shall not exceed 0.035% based on average of three specimens from a representative sample one of the batches at the minimum cement factor as outlined in Section 4.3.1 ~~3.3~~ of MP 711.03.23. This sample shall be tested in accordance with ASTM C878. The initial 7-day expansion shall range from 0.03% to 0.06%. Specimens shall be moist cured for 7 days before beginning the 28-drying shrinkage testing.

  The cost of all test mix requirements shall be considered incidental to the cost of Class S concrete.

601.3.1-Mix Design Requirements:

DELETE THE CONTENTS OF THE SUBSECTION AND REPLACE WITH THE FOLLOWING:

Prior to the start of construction, the Contractor shall design and submit to the Engineer for approval the proportion of materials, including admixtures, to be used which will result in a workable concrete having the applicable properties enumerated below, including those of Table 601.3.1A. A mix design prepared in accordance with MP 711.03.23, shall be required for each class of concrete to be used in the work. The mix design shall be accompanied by a statement giving the source of materials and certified test data from a Division approved laboratory demonstrating the adequacy of the mix design. The Contractor shall notify the Engineer of any change in the source of materials or the addition of admixtures during the progress of the work, since such change may necessitate a new mix design. The Contractor shall also state the Ā value of the fine aggregate and the Ā value of the combined grading of the coarse aggregate, fine aggregate, and cement used in the mix design. Each mix design shall remain approved for a period of three years from the date of approval, after which the mix design may be re-approved for an additional time period. The guidelines for this re-approval process are set forth in MP 711.03.23.

Approved Hydration Control Stabilizing Admixtures, as defined in Section 707.15, which are designed to stop the hydration of cement in a concrete mix, enabling an extension to the allowable discharge time from a truck mixer as outlined in Section 601.7, may be added to an

existing approved concrete mix design in accordance with the procedures outlined in MP 711.03.23.

TABLE 601.3.1A

Class of Concrete	Design 28 Day Compressive Strength	Target Cement Factor	Maximum Water Content	Standard Size of Coarse Aggregate***	Entrained Air
	Pounds per Square inch	lbs./c.y.*	lb. of water / lb. of cement **	Number	Percent
A	3500	682	0.51	7, 78, or 8	7.5
K	4000	658	0.44	57, 67	7.0
B	3000	564	0.49	57, 67	7.0
C	2500	494	0.58	57, 67	6.0
D	2000	400	0.62	57, 67	5.5
H	4000	See Table 601.3.1C	0.40	57,67	6.5
DC	4500	705	0.44	7, 78, 8	6.0

* An equal mass of a SCM may be substituted for Portland cement up to the maximum amount in Table 601.3.1B. Only one SCM is permitted in a mix design, except for Class H concrete. The target cement factor of Class H concrete shall consist of Option 1 or Option 2 from Table 601.3.1C. The Contractor may choose either option.

** When using a SCM, masses of these materials shall be considered as cement for purposes of establishing maximum water content.

*** A number 67 coarse aggregate may be used in Class DC concrete, provided the Engineer approves the use of that size aggregate for the specific project on which it is to be used. That approval will depend on the minimum spacing of the reinforcing steel in the drilled shaft foundation.

TABLE 601.3.1B

Material	Class of Concrete	Quantity
Fly Ash	All Classes Except H	20%
Slag Cement	All Classes Except H	50%
Silica Fume	All Classes Except H	8%

TABLE 601.3.1C

Option	Cement	Fly Ash	Slag Cement	Silica Fume
1	470 lbs.	132 lbs.		30 lbs.
2	423 lbs.		195 lbs.	30 lbs.

MP 711.03.26 shall be used to control the cement factor in all classes of concrete except Class H and Class S.

The Contractor may develop mix designs with a reduced target cement factor as indicated in Table 601.3.1D in lieu of Table 601.3.1A, provided the aggregates used in those mix designs meet the requirements for optimized aggregate gradation in Section 601.3.2.4.1. The Ā requirements will not apply for mix designs that use optimized aggregate gradation.

The Contractor shall develop Class S mix designs according to the requirements of Table 601.3.1D. The aggregates used in Class S mix designs shall meet the requirements for

optimized aggregate gradation in Section 601.3.2.4.1. The Ā requirements will not apply to Class S concrete.

TABLE 601.3.1D

Class of concrete	Design 28 Day Compressive Strength	Target Cement Factor	Maximum Water Content	Nominal Maximum Aggregate Size	Entrained Air
	Pounds per Square inch	lbs./c.y. Note 1	lb. of water/lb. of cement Note 2	Inches	Percent
A	3,500	642	0.51	½ or ⅜	7.5
K	4,000	618	0.44	1 or ¾	7.0
B	3,000	524	0.49	1 or ¾	7.0
C	2,500	454	0.58	1 or ¾	6.0
D	2,000	360	0.62	1 or ¾	5.5
H	4,000	See Table 601.3.1E	0.40	1 or ¾	6.5
S	4,000	600	0.42 Note 4	1 or ¾	6.5
DC Note 3	4,500	665	0.44	½ or ⅜	6.0

Note 1 An equal mass of a SCM may be substituted for Portland cement up to the maximum amount in Table 601.3.1B. Only one SCM is permitted in a mix design, except for Class H concrete. The target cement factor of Class H concrete shall consist of Option 1 or Option 2 from Table 601.3.1E. The Contractor may choose either option. This footnote does not apply to Class S concrete for the substitution of a SCM for cement. The substitution of a SCM for cement is specified in the last paragraph of this subsection.

Note 2 When using a SCM, masses of these materials shall be considered as cement for purposes of establishing maximum water content.

Note 3 Nominal maximum aggregate size of $^{3}/_{4}$ inches may be used in Class DC concrete, provided the Engineer approves the use of that size aggregate for the specific project on which it is to be used. That approval will depend on the minimum spacing of the reinforcing steel in the drilled shaft foundation.

Note 4 The maximum water content for a mix design with Expansive hydraulic cement may be increased to 0.45.

TABLE 601.3.1E

Option	Cement	Fly Ash	Slag Cement	Silica Fume
1	440 lbs.	127 lbs.		25 lbs.
2	397 lbs.		186 lbs.	25 lbs.

The target cement factor for Class S concrete shall include at least one of the SCMs from Table 601.3.1F as a replacement portion by equal mass. The SCM(s) shall be limited to not more than two of the SCMs listed in Table in 601.3.1F. However, the maximum replacement percentage for any individual SCM shall not be exceeded, and the total replacement percentage of any combination of SCMs shall not exceed 50%.

TABLE 601.3.1F

Material	Quantity	
	Minimum %	Maximum %
Fly Ash	15	25
Slag Cement	25	50
Silica Fume	6	10

601.3.1.1-Mix Design Using Potentially Reactive Aggregate:
601.3.1.1.1-Selecting Preventive Measures For ASR:
601.3.1.1.1.3-Level of Prevention:

DELETE THE TABLE AND REPLACE WITH FOLLOWING:

TABLE 601.3.1.1.1.3
Determining the Level of Prevention

Level of ASR Risk	Classes of Concrete		Precast Concrete Member	Prestressed Concrete Member
	D	A, B, C, K, H, S, DC		
Risk Level 0	V	V		V
Risk Level 1	W	X		Y
Risk Level 2	X	Y		Z
Risk Level 3	Y	Z		See footnote**

** It is not permitted to construct prestressed concrete members (Section 603) with Aggregate Reactivity Class of R3. Measures must be taken to reduce the level of risk in these circumstances by selecting the aggregates only from the Reactivity Classes of R0, R1, or R2.

601.3.1.1-Mix Design Using Potentially Reactive Aggregate:
601.3.1.1.1-Selecting Preventive Measures For ASR:
601.3.1.1.1.4-Requirements for Various Prevention Levels:

DELETE THE CONTENTS OF THE SUBSECTION AND REPLACE WITH THE FOLLOWING:

These requirements shall apply to all classes of concrete except Class H and Class S. The prevention levels for Class H and Class S concrete is specified in section 601.3.1.1.1.5.

601.3.1.1-Mix Design Using Potentially Reactive Aggregate:
601.3.1.1.1-Selecting Preventive Measures For ASR:
601.3.1.1.1.4-Requirements for Various Prevention Levels:
601.3.1.1.1.4.2-Preventions Level W, X and Y:

DELETE AND REPLACE THE CONTENTS OF TABLE 601.3.1.1.1.4.2b WITH THE FOLLOWING:

TABLE 601.3.1.1.1.4.2b
Minimum Replacement Level of SCM (percentage by mass of cementitious material)

Type of SCM*****	Alkali Content of SCM* (Na_2Oe)	Level W	Level X	Level Y
Fly ash** (Cao ≤18%)	≤3.0	15	20	25****
	>3.0, ≤4.5	20	25****	Not Allowed
Slag Cement	≤1.0	25	35	50

TABLE 601.3.1.1.1.4.2b

Minimum Replacement Level of SCM (percentage by mass of cementitious material)

Silica Fume***	≤1.0	1.2 x LBA or 2.0 x KGA	1.5 x LBA or 2.5 x KGA	1.8 x LBA or 3.0 x KGA

* The alkali content of all approved SCM sources is listed on the WVDOH approved list of SCMs (APL). If the alkali content of an SCM source is not listed on the APL, the Division will test the SCM from the source to determine the alkali content prior to its use on any WVDOH project.

** The CaO content of approved fly ash sources is listed on the WVDOH approved list of fly ash (APL). If the CaO content of a fly ash source is not listed on the APL, the Division will test the fly ash from the source to determine the CaO content prior to its use on any WVDOH project.

*** The minimum level of silica fume (as a percentage by mass of cementitious material) is calculated on the basis of the alkali (Na_2Oe) content of the concrete contributed by the Portland cement and expressed in lb/yd³ (LBA in Table 601.3.1.1.1.4.2b). LBA is calculated by multiplying the cement content of the concrete in lb/yd³ by the alkali content of cement divided by 100. For example, for a concrete containing 500 lb/yd³ of cement with an equivalent alkali content of 0.81 percent of Na_2Oe, the value of LBA = 500 x 0.81/100 = 4.05 lb/yd³. For this concrete, the minimum replacement level of silica fume for Level Y is 1.8 x 4.05 = 7.3 percent. Regardless of the calculated value, the minimum level of silica fume shall not be less than 7 percent when it is only method of prevention. Mix design with silica fume > 8% shall be reviewed and approved by the Engineer.

**** Mix designs with minimum 25% of fly ash shall be reviewed and approved by the Engineer.

***** If two SCMs are used in Class S concrete in combination, the minimum mass replacement levels given in Table 601.3.1.1.1.4.2b for the individual SCMs may be reduced, provided the sum of the parts of each SCM is greater than or equal to one. For example, if silica fume and slag cement are used together, the silica fume level may be reduced to one-third of the minimum silica fume level in the Table 601.3.1.1.1.4.2b provided the slag cement is at least two-thirds of the minimum slag level required.

Note: The minimum replacement levels in Table 601.3.1.1.1.4.2b are appropriate for use with Portland cements of moderate to high alkali contents (0.71 to 1.00 percent Na_2Oe). Table 601.3.1.1.1.4.2c provides recommendations for adjusting the level of SCM when the equivalent alkali content of the Portland cement is above or below this range. The replacement levels should not be below those given in Table 601.3.1.1.1.4.2b for prevention level W, regardless of the equivalent alkali content of the Portland cement.

DELETE AND REPLACE THE CONTENTS OF OPTION 3 WITH THE FOLLOWING:

Option 3: Using the Lithium Nitrate Admixture: The 30 percent (30%) aqueous solution of Lithium Nitrate Admixture meeting the requirements of Section 707.17 shall be used for all level of prevention including "Level Z" given in Table 601.3.1.1.1.3 except for Class H and Class S concrete. The dosage rate of Lithium Nitrate Admixture shall be based upon the alkali content of cement used in a concrete mix.

Calculation of lithium nitrate ($LiNO_3$) admixture dosage (100 percent) for mitigation without use of SCMs with a 30 percent (30%) aqueous solution of lithium nitrate.

$$\text{Gallons of } LiNO_3/yd^3 = (A \times B \times 0.55)/100$$

Where:

A = Pound of Portland cement per cubic yard in a concrete mix

B = Percentage of Alkali content of cement used in a concrete mix

Example: If the cement content of concrete is 550 lbs/yd^3 and the total alkali content of the cement is 0.82 percent (0.82%), the dosage of lithium nitrate admixture is: (550 x 0.82 x 0.55)/100 = 2.48 Gal/yd^3.

The water content of the mix shall be adjusted by removing 0.85 gallons of water per gallon of lithium nitrate solution.

Example: Amount of water to be reduced (using the value from above example) Gal/yd^3 = 0.85 x 2.48 = 2.11

Any concrete mix using a 100 percent (100%) lithium nitrate admixture dosage will be accepted without evaluation. The contractor shall evaluate the effectiveness of less than 100 percent (100%) lithium nitrate admixture in a concrete mix, alone or in combination with fly ash or slag cement or silica fume, in the reduction of expansion in accordance with ASTM C1567*, when a reactive aggregate(s) is (are) used in a concrete mix, at a Division approved lab (an AASHTO accredited Lab, accredited for ASTM C1567) at the contractor's expense. The dosage rate shall not be less than 50 percent (50 %) when only a lithium nitrate admixture is using for evaluation and no SCMs are included in the concrete mix. The sampling and shipping of all aggregate shall be witnessed by a representative of the Division. The ASTM C1567 test results will be considered valid for 5 years from the date of testing.

If both of the aggregates (coarse and fine) used in a concrete mix are reactive (R1, R2 or R3), the contractor shall evaluate the effectiveness of the lithium nitrate admixture, alone or in combination with fly ash or slag cement or silica fume for both of the aggregates separately. When the same source material** is proposed for the use both as coarse and as fine aggregate, test only a selection of the reactive fine aggregate or reactive coarse aggregate, unless there is reason to expect that the coarse aggregate has a different composition than the fine aggregate or vice-versa. The combination of cement, lithium nitrate admixture, alone or in combination with fly ash or slag cement or silica fume, and aggregate that expands less than 0.10% at 16 days after casting will be considered as meeting the "Requirements for Various Prevention Levels (Section 601.3.1.1.1.4)" except for Class H and Class S concrete.

The approved lithium nitrate admixture shall meet the requirements of Section 707.17 and will be listed as "Type S" admixture with footnote of approved admixture for ASR mitigation on the MCS&T web page under Division Approved Source/Product Listing (APL) for Type S: Special Performance. The alkali level of fly ash used in the subject mix shall not exceed 4.5%. The alkali level of slag cement used in the subject mix shall not exceed 1.00%. The alkali level of silica fume used in the subject mix shall not exceed 1.00%. Mix design shall be reviewed and approved by the Engineer.

* Modify the w/c ratio of the mortar used in the ASTM C1567 test to 0.50.

Replace Section 5.3 (Sodium Hydroxide Solution) of ASTM C1567 with the following:
Sodium Hydroxide Solution - Each liter of solution shall contain 40.0 g of NaOH dissolved in 800 ml of water. Add 71 ml of the lithium nitrate admixture multiplied by the decimal equivalent of the lithium nitrate admixture dosage. (For example,

to test a 75% lithium nitrate admixture dosage, each liter of solution will contain 0.75 times 71 ml of lithium nitrate admixture.) This mixture shall be diluted with additional distilled or deionized water to obtain 1.0 liter of solution. The volume proportion of soaking solution to mortar bars in a storage container shall be 4 ± 0.5 volumes of solution to 1 volume of mortar bars. The volume of a mortar bar may be taken as 184 ml. Include sufficient test solution to ensure complete immersion of the mortar bars.

** Same source material applies to same Limestone, Diabase, Quartzite and Basalt source.

601.3.1.1-Mix Design Using Potentially Reactive Aggregate:
601.3.1.1.1-Selecting Preventive Measures For ASR:
601.3.1.1.1.5-Requirements for Various Prevention Levels for Class H Concrete:

DELETE THE TITLE OF THE SUBSECTION AND REPLACE WITH THE FOLLOWING:

601.3.1.1.1.5-Requirements for Various Prevention Levels for Class H and Class S Concrete:

601.3.1.1-Mix Design Using Potentially Reactive Aggregate:
601.3.1.1.1-Selecting Preventive Measures For ASR:
601.3.1.1.1.6-Evaluation of the effectiveness of SCM to prevent deleterious expansion:

DELETE THE CONTENTS OF THE SECTION AND REPLACE WITH THE FOLLOWING:

The contractor may evaluate the effectiveness of an SCM in the reduction of expansion in accordance with ASTM C1567*, when a reactive aggregate(s) is (are) used in a concrete mix, at a Division approved lab (an AASHTO accredited Lab, accredited for ASTM C1567) at the contractor's expense. The sampling and shipping of all aggregate shall be witnessed by a representative of the Division. ASTM C1567 test will be considered valid for 5 years from the date of testing.

If both of the aggregates (coarse and fine) used in a concrete mix are reactive (R1, R2 or R3), the contractor shall evaluate the effectiveness of SCM for both of the aggregates separately. When the same source material** is proposed for the use both as coarse and as fine aggregate, test only a selection of the reactive fine aggregate or reactive coarse aggregate, unless there is reason to expect that the coarse aggregate has a different composition than the fine aggregate or vice-versa. The combination of cement, SCM and aggregate that expand less than 0.10% at 16 days after casting will be considered as meeting the "Requirements for Various Prevention Levels (Section 601.3.1.1.1.4)" except for Class H and Class S concrete. The evaluation with the higher percentage of SCM replacement shall be selected for the minimum replacement level of SCM for prevention level in a mix design using potentially reactive aggregate.

When more than one mix design, for the same Producer/Supplier, is submitted for evaluation, only one evaluation of the effectiveness of an SCM in the reduction of expansion in accordance with ASTM C1567 testing data, as outlined in paragraphs first through four of this sub-section, will be required for that entire group of mix designs (except Class H and Class S) if all of the mix design in that entire group of mix designs have the same combination of cement, SCM and aggregate sources.

The alkali level of fly ash shall not exceed 4.5%. The alkali level of slag cement shall not exceed 1.00%. The alkali level of silica fume shall not exceed 1.00%. Mix designs with minimum 25% of fly ash shall be reviewed and approved by the Engineer. Mix design with silica fume > 8% shall be reviewed and approved by the Engineer.

* Modify the w/c ratio of the mortar used in the ASTM C1567 test to 0.50.
** Same source material applies to same Limestone, Diabase, Quartzite and Basalt source.

601.3.2-Field Tolerances and Adjustments:

601.3.2.1-Consistency:

DELETE THE CONTENTS OF THE FOURTH PARAGRAPH AND REPLACE WITH THE FOLLOWING:

Upon addition of a superplasticizer at the job site, the mixing drum shall be turned for a minimum of 60 revolutions or 5 minutes at mixing speed to establish a workable mixture of uniform composition and consistency. If a second job site addition of superplasticizer is used; the mixing drum shall be turned a minimum of 30 additional revolutions at mixing speed. All additions and mixing of the superplasticizer shall be completed before placement of the concrete is started. The total number of revolutions shall not exceed 300, and the concrete shall be discharged within the time limits in section 601.7. The slump of Class H and Class S concrete shall not exceed seven (7) inches under any circumstances.

601.3.2.2-Air Content:

DELETE THE SECTION AND REPLACE WITH THE FOLLOWING:

The target value of the entrained air at the point of placement shall be as shown in Tables 601.3.1A and D. However, when pumping concrete, the air content shall be measured before the concrete pump, and the target value of the entrained air shall be as shown in Tables 601.3.1A and D at that point. If the entrained air does not conform with the target value within plus or minus 2.5 percentage points, the Contractor shall take immediate steps to adjust the air content of succeeding loads by making necessary adjustments in the mixture. The air content shall be measured on loads already batched and enroute, as well as the first load to which any adjustments were made in batching procedures. If the air content exceeds the target value plus 3.0 percentage points the concrete shall be rejected. When the concrete is delivered in a truck mixer and the air content is less than the target value minus 2.5 percentage points the concrete shall be rejected, or the Contractor may use additional air entraining agent in an amount that is intended to achieve the target value specified. The addition is permitted under the conditions listed below.

The target of the entrained air content of Class H and Class S concrete at the time of placement shall be as shown in Tables 601.3.1A and D. If the entrained air does not conform with the target value within plus or minus 1.5 percentage points, the Contractor shall take immediate steps to adjust the air content of succeeding loads by making necessary adjustments in the mixture. If the entrained air content of Class H and Class S concrete does not conform to the target value plus 2.0 percentage points, the concrete shall be rejected. When Class H or Class S concrete is delivered in a truck mixer and the air content is less than the target value minus 2.0 percentage points, the concrete shall be rejected, or the Contractor may use additional air-entraining agent in an amount that is intended to achieve the target value specified. The addition is permitted under the conditions listed below.

i. The air entraining agent is the same as used in the approved mix design and is thoroughly mixed with a minimum of 2 gallons of water. The solution will be directed to the front of the mixer.
ii. The mixer is turned a minimum of 30 revolutions, at mixing speed, or the number of revolutions established in tests to comply with uniformity requirements, whichever is more.

Immediately after mixing, the air content and slump shall be measured by a certified inspector.

An air adjustment may be attempted twice per truck. If after the second addition the specified air content is not achieved, the concrete shall be rejected. These procedures do not alter the limits placed on time to discharge, the total revolutions of the mixing drum, or the specified slump.

601.4-TESTING:

601.4.1-Sampling and Testing Methods:

ADD THE FOLLOWING TO THE TABLE:

Surface Resistivity Test	AASHTO T 358

ADD THE FOLLOWING SUBSECTION:

601.4.6-Surface Resistivity Tests for Acceptance of Class S Concrete: The Contractor shall also be required to fabricate and test three (3) Surface Resistivity test specimens, in accordance with AASHTO R 100 and AASHTO T 358, every time that a set of compressive strength specimens for Class S concrete is fabricated. These test specimens shall be 4-inch x 8-inch, and they shall be tested at an age of 28-days. These test specimens shall be moist cured until as close to the time of testing as possible and the results of this test shall not be less than 30 kΩ-cm. If the testing result is less than 30 kΩ-cm, then the concrete represented by resistivity value may be removed and replaced by the Contractor. If the Contractor elects to leave the material in place, the Engineer shall evaluate it as to the adequacy for the use intended. All concrete evaluated as unsatisfactory for the use intended shall be removed and replaced by the Contractor. When the Engineer's evaluation indicates that the work may satisfactorily remain in place, the subject material shall be paid for at a reduced unit price based on Table 601.4.6.

Table 601.4.6

Resistivity result obtained (values expressed in kΩ-cm)	Percent of unit bid price paid for material in question
28-29	95%
26-27	90%
24-25	85%
22-23	80%
20-21	70%
<20	Remove and replace

601.6-HANDLING, MEASURING, AND BATCHING OF MATERIALS:

ADD THE FOLLOWING PARAGRAPH AFTER THE FOURTH PARAGRAPH

When Expansive hydraulic cement is used, to avoid potential localized volcanic expansions, it is recommended to use pre-blended Type K expansive cement. Alternatively, the Expansive component can be added by a pre-mixed slurry at the plant or by slurry pump at the jobsite, instead of pre-blended cement, to prevent potential localized volcanic expansions.

601.7-MIXING:

DELETE AND REPLACE THE CONTENTS OF THE SIXTH PARAGRAPH OF THE SUBSECTION WITH THE FOLLOWING:

For all classes of concrete except Class H, Class S, and concrete for specialized overlays, the total amount of water in a concrete mix, including any water added at the job site, shall not be more than the amount which would cause the water-cement ratio (w/c) of that concrete mix to exceed the w/c which corresponds to the Mix Design Approved Strength, as outlined in Section 5.4 of MP 711.03.23. The maximum water amount shall also be shown in Attachment 4 or 5 of MP 711.03.23 for all approved concrete mix designs. However, under no circumstances shall the w/c in Table 601.3.1A be exceeded.

601.9-ADVERSE WEATHER CONDITIONS:

601.9.1-Cold Weather Concreting:

DELETE AND REPLACE THE FOLLOWING CONTENTS IN THE LAST PARAGRAPH:

Class H, Class S, and Class K Concrete Cold Weather Provisions: Cold weather periods shall be defined as those periods when temperatures above 50° F do not occur for more than half of any 24-hour duration. The temperature of the surface on which the concrete is to be placed shall not be less than 45° F immediately prior to placement of the concrete. During the cold weather

periods, as defined above, the temperature of the concrete immediately after placement shall be between 55 and 75° F.

601.10-PLACING CONCRETE:

601.10.1-General:

601.10.1.2-Concrete Placement Limitations:

DELETE AND REPLACE THE CONTENTS OF THE FIRST PARAGRAPH IN THE SUBSECTION:

Immediately prior to, and during, placement of Class H and Class S concrete, if the evaporation rate exceeds 0.10 lb./sq. ft. per hour (see Figure 1), the Contractor shall make provisions (i.e. wind breaks, fogging, etc.) to reduce the rate prior to placing concrete. These provisions shall be maintained during the placement of the concrete. If the evaporation rate obtained from Figure 1 is close enough to the maximum allowable value of 0.10 lb./sq. ft. per hour that there may a discrepancy in the exact numerical value, the following equation shall be used to obtain a more accurate value.

601.10.4-Placing Concrete Bridge Decks:

601.10.4.1-Fogging Equipment:

REMOVE AND REPLACE THE CONTENTS OF THE SUBSECTION WITH THE FOLLOWING:

When Class H and Class S concrete is used, fogging equipment shall be available for use in accordance with these specifications. The fogging nozzles shall produce an atomized mist. Fogging nozzles shall incorporate compressed air to create the mist. Handheld or hand operated equipment shall be permitted when the Contractor has demonstrated that his operator has been trained in its use.

601.11-FINISHING CONCRETE SURFACES:

601.11.4-Finishing Concrete Bridge Decks:

601.11.4.2-Class H Bridge Decks:

DELETE THE TITLE AND CONTENT OF THE SUBSECTION AND REPLACE WITH THE FOLLOWING:

601.11.4.2-Class H and Class S Bridge Decks: The surface of the Class H and Class S concrete shall be uniformly smooth, dense and even. The surface shall then be given a suitable texture with an approved burlap drag.

The Contractor shall texture in a transverse or longitudinal direction. Once begun, the direction of texturing shall not change. All texturing shall be performed prior to the beginning of curing operations. Only one pass of the drag over the finished area will be

permitted. Texturing shall be in strict accordance with the time requirements of 601.12.4 for applying wet burlap.

If texturing is done in the transverse direction, the Contractor shall texture by hand methods as soon as practicable after finishing machine passage, without any additional finishing operations between the machine passage and texturing operations.

If texturing is done in the longitudinal direction, the burlap drag shall be a seamless strip and shall be attached to the work bridge such that the surface of the concrete is textured as soon as practicable after finishing machine passage, without any additional finishing operations between the machine passage and texturing operations. Small areas, inaccessible to the attached drag, may be textured by hand methods.

The finishing movement and resulting progress of the burlap drag shall be done in a manner so as to prevent ridges or gouges from forming in the concrete surface. The drag shall be weighted, and the contact area changed as required to produce a texture acceptable to the Engineer. The drag shall be cleaned as required; to remove all hardened concrete particles and shall be replaced after each day's operation.

Texture resulting from the drag shall stop within one foot of curbs or parapets.

Any hand finishing operations shall be kept to a minimum for Class H and Class S bridge decks.

601.11.4.4-Class H Concrete Finished Deck Grooving:

ADD THE FOLLOWING TO THE TITLE OF THE SUBSECTION:

601.11.4.4-Class H and Class S Concrete Finished Deck Grooving:

601.12-CURING AND PROTECTING CONCRETE:

601.12.1-Curing Under Normal Conditions:

DELETE AND REPLACE THE CONTENTS OF THE SECOND PARAGRPAH WITH THE FOLLOWING:

Concrete surfaces shall be kept completely and continuously moist. Curing shall be continued for a period of at least 7 days. This curing period may be reduced if the contractor presents evidence that the in-place concrete has attained 70% of the specified strength for the class of concrete under cure. Under no circumstances, shall the period of cure be less than 3 days. The reduced curing period option is not applicable to Class H, Class S, or Class K concrete. When placing concrete elements with a minimum dimension greater than two (2) feet, the contractor shall not be permitted to add additional cement to the target cement factor in the approved mix design in order to obtain high-early strength and/or reduce curing time. Surfaces may have coverings temporally removed for finishing, but the covering shall be restored as soon as possible.

601.12.2-Curing Under Cold Weather Conditions:

DELETE THE FOURTH PARAGRAPH AND REPLACE WITH THE FOLLOWING:

Class H, Class S, and Class K Concrete Provisions: The surface temperature of the concrete shall be maintained between 55 and 75°F for 72 continuous curing hours immediately after placement. After this 72 hour period, a minimum concrete surface temperature of at least 50°F shall be maintained for an additional 96 continuous curing hours.

601.12.4-Curing Class H Concrete:

REMOVE AND REPLACE THE CONTENTS OF THE TITLE AND SUBSECTION WITH THE FOLLOWING:

601.12.4-Curing Class H and Class S Concrete: It is the nature of Class H and Class S concrete material to quickly form a plastic film at the surface upon drying. This film is to be protected from drying and cracking by prompt covering with wet burlap. Regardless of the type of concrete placed, the use of membrane curing compounds will not be allowed. Floor drains shall be immediately unplugged to permit the deck to drain.

The concrete surface shall be completely covered with clean, wet burlap. The burlap shall be thoroughly saturated over its entire area, but shall be drained of excess water before application. Burlap shall be lapped a minimum of one foot and shall lay flat. Failure to apply wet burlap within 30 minutes after discharge of the concrete from the truck and within 10 minutes of the completion of finishing operations shall be cause for rejection of the work as determined by the Engineer. Care shall be exercised to ensure that the burlap is well drained. Burlap shall be continuously wet for a period of seven days by means of automatic intermittent sprinkling or a continuous wetting system.

601.13-PROTECTIVE SURFACE TREATMENT:

601.13.1-Silane Treatment for Bridge Superstructure:

REMOVE AND REPLACE THE SECOND PARAGRAPH OF THE SUBSECTION WITH THE FOLLOWING:

The application of this silane protective surface treatment is not required for elements constructed from Class H and Class S concrete.

601.14-METHOD OF MEASUREMENT:

REMOVE AND REPLACE THE FIRST AND SECOND PARAPGRAPH OF THE SUBSECTION WITH THE FOLLOWING:

The quantity of work done for Classes A, B, C, D, H, K, M, and S concrete will be measured in cubic yards, complete in place and accepted as determined by the dimensions on the Plans or Contract Documents, subject to adjustments provided for in Sections 104.2 and 109.2.

The quantity of work done for Class H, Class S, and Class K concrete will be measured in cubic yards, complete in place and accepted, as measured from one end of the bridge to the other, fascia to fascia, and from the top of the forms to the finished elevation of the proposed deck surface. The volume of concrete required to fill the flutes of stay-in-place forms shall be calculated by

taking the Contractor's approved SIP_{adj} factor and multiplying by the square yardage of SIP area minus beam widths, expansion dam widths, etc. as applicable.

601.16-PAY ITEMS:

ADD THE FOLLOWING TO THE TABLE:

ITEM	DESCRIPTION	UNIT
601010-*	Class S Concrete	Cubic Yard
601025-009	Modified Concrete, Class S	Cubic Yard
601026-005	Modified Architectural Concrete, Class S	Cubic Yard