

**FEDERAL HIGHWAY ADMINISTRATION  
FEDERAL LANDS HIGHWAY**

**ERRATA**

**STANDARD SPECIFICATIONS FOR CONSTRUCTION OF  
ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS,  
FP-24**

Corrections, additions, and revisions to the Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects, FP-24 are listed below:

**Section 101. — TERMS, FORMAT, AND DEFINITIONS**

**101.04 Definitions.** Delete the definition of (c) Supplemental agreement under Contract Modification.

**Section 106. — ACCEPTANCE OF WORK**

**106.03(b) Production certification.** Delete the first sentence of (3) and substitute the following:

Substantiating evidence that the material conforms to the contract quality requirements, including the following:

**Section 107. — LEGAL RELATIONS AND RESPONSIBILITY  
TO THE PUBLIC**

**107.03 Bulletin Board.** Delete Subsections (a) and (f).

## Section 108. — PROSECUTION AND PROGRESS

**108.01 Commencement, Prosecution, and Completion of Work.** Delete the first sentence.

**108.04 Determination and Extension of Contract Time.** Delete the first sentence.

**108.04(c) Time extensions.** Add the following:

If a quantity variation described in Subsection 109.06(e) results in an increase in the time necessary for completion, the Contractor may request, in writing, an extension of time, to be received by the CO within 10 days from the beginning of the delay, or within such further period as may be granted by the CO before the date of final settlement of the contract. Upon the receipt of a written request for an extension, the CO will ascertain the facts and make an adjustment for extending the completion date as, in the judgement of the CO, is justified.

## Section 109. — MEASUREMENT AND PAYMENT

**109.01 Measurement of Work.** Delete the sixth paragraph.

**109.02(d)(1)(a) Average end area method.** Delete this Subsection and substitute the following:

*(a) Average end area method.* Take cross-sections of the original ground. Use design or staked templates to determine end areas. Compute the quantity using the average end areas multiplied by the horizontal distance along a centerline or reference line between the end areas.

**109.06(c)(3) Profit.** Delete this Subsection and substitute the following:

**(3) Profit.** Include a reasonable profit, except when precluded by the FAR. Limit profit to 10 percent of the total cost. Due to the limited risk in post-work pricing, a lower profit percentage may be determined by a profit analysis according to FAR 15.404-9 Profit.

**109.06(d) Cost or pricing data.** Delete the first paragraph and substitute the following:

When the contract modification exceeds the amount indicated in FAR Clause 52214-27 Price Reduction for Defective Cost or Pricing Data – Modifications – Sealed Bidding, FAR Clause 52.215-10 Price Reduction for Defective Certified Cost or Pricing Data, or FAR Clause 52.215-11 Price Reduction for Defective Cost or Pricing Data – Modifications, and the CO has determined that an exception does not apply, submit cost or pricing data according to Subsection 109.06(b) or (c) as applicable and as defined in FAR Subpart 2.1 Definitions, for the Contractor and each major subcontractor. See FAR Subpart 15.4 Contract Pricing and FAR Table 15-1 Instructions for Submitting Cost/Price Proposals When Certified Cost or Pricing Data Are Required for guidance.

**109.06 Pricing of Adjustments.** Add the following:

(e) **Variation in Estimated Quantity.** If the quantity of a unit-priced item is an estimated quantity and the actual quantity of the unit-priced item varies more than 15 percent above or below the estimated quantity, an equitable adjustment in the contract price will be made upon demand of either party. The equitable adjustment will be based upon any increase or decrease in costs due solely to the variation above 115 percent or below 85 percent of the estimated quantity.

**Section 204. — EXCAVATION AND EMBANKMENT****204.16(c)(1)(a).** Delete this Subsection and substitute the following:

(a) Roadway prism embankments. Use the design volume. The design volume is defined as the bid schedule quantity less any allowance, as shown in the plans. This volume is subject to adjustments resulting from changes to slope stakes according to Subsection 152.05(d);

**Section 255. — MECHANICALLY-STABILIZED EARTH WALLS**

**255.04 Wall Erection.** Delete the second sentence of footnote (1) in Table 255-1 and substitute the following:

For example, 65 feet wall height multiply  $6.5 \times$  value.

**Section 301. — UNTREATED AGGREGATE COURSES**

**301.07 Acceptance.** Delete Table 301-1 and substitute the following:

**Table 301-1  
Sampling, Testing, and Acceptance Requirements**

<b>Material or Product (Subsection)</b>	<b>Type of Acceptance (Subsection)</b>	<b>Characteristic</b>	<b>Category</b>	<b>Test Methods Specifications</b>	<b>Sampling Frequency</b>	<b>Point of Sampling</b>	<b>Split Sample</b>	<b>Reporting Time</b>	<b>Remarks</b>
<b>Source</b>									
Aggregate quality (703.05(a), (b), & (c))	Measured & tested for conformance (106.04 & 105)	LA abrasion (coarse)	-	AASHTO T 96	1 per type & source of material	Source of material	Yes	Before using in work	Not required if using Government-furnished sources
		Soundness using sodium sulfate (coarse & fine)	-	AASHTO T 104	"	"	"	"	"
		Fractured faces	-	AASHTO T 335	"	"	"	"	"
		Liquid limit	-	AASHTO R58 & T 89, Method A	"	"	"	"	"
Surface course aggregate (703.05(c))	Measured & tested for conformance (106.04 & 105)	Plasticity index	-	AASHTO R 58, T 89, & T 90	1 per type & source of material	Crusher belt or after processing	Yes	Before using in work	Not required if using Government-furnished sources
Subbase, base, or surface course aggregate (703.05(b) & (c))	Process control (153.03)	Gradation	-	AASHTO T 11 & T 27	2 per day per stockpile minimum	Crusher belt	No	24 hours	Not required if using a pre-crushed commercial source
		Fractured faces	-	AASHTO T 335	"	"	"	"	-
Surface course aggregate (703.05(c))	"	Plasticity index	-	AASHTO R 58, T 89, & T 90	2 per day per stockpile minimum	Crusher belt or after processing	Yes	24 hours	Not required if using a pre-crushed commercial source

**Table 301-1 (continued)  
Sampling, Testing, and Acceptance Requirements**

Material or Product (Subsection)	Type of Acceptance (Subsection)	Characteristic	Category	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time	Remarks
<b>Production</b>									
Subbase course	Statistical (106.05)	Gradation		AASHTO T 27 & T 11	1 per 1000 tons	From windrow or roadbed after processing	Yes	4 hours	-
		No. 4	I						
		No. 200	I						
		Other specified sieves	II						
Base course	Statistical (106.05)	Gradation		AASHTO T 27 & T 11	1 per 1000 tons	From windrow or roadbed after processing	Yes	4 hours	-
		3/8 in	I						
		No. 4	I						
		No. 200	I						
Subbase & base course	Measured & tested for conformance (106.04)	Liquid limit	-	AASHTO R 58 & T 89, Method A	1 per 1000 tons	From windrow or roadbed after processing	Yes	4 hours	-
		Moisture-density (maximum density)	-	AASHTO T 180, Method D <sup>(1)</sup>	1 per type & source of material	Stockpile or production output	"	"	-
		Density	-	AASHTO T 310 or other approved procedures	1 per 500 tons	In-place after compaction	No	End of shift	-
		Moisture content (in-place)	-	"	"	"	"	"	-
Surface course aggregate	Statistical (106.05)	Gradation		AASHTO T 27 & T 11	1 per 1000 tons	From windrow or roadbed after processing	Yes	4 hours	-
		No. 4	I						
		No. 40	I						
		No. 200	I						
				Other specified sieves	II				
		Plasticity index	I	AASHTO R 58, T 89, & T 90	"	"	"	"	-

**Table 301-1 (continued)  
Sampling, Testing, and Acceptance Requirements**

<b>Material or Product (Subsection)</b>	<b>Type of Acceptance (Subsection)</b>	<b>Characteristic</b>	<b>Category</b>	<b>Test Methods Specifications</b>	<b>Sampling Frequency</b>	<b>Point of Sampling</b>	<b>Split Sample</b>	<b>Reporting Time</b>	<b>Remarks</b>
<b>Production (continued)</b>									
Surface course aggregate	Measured & tested for conformance (106.04)	Moisture-density (maximum density)	-	AASHTO T 180, Method D <sup>(1)</sup>	1 per type & source of material	Stockpile or production output	Yes	"	-
		Density	-	AASHTO T 310 or other approved procedures	1 per 500 tons	In-place after compaction	No	End of shift	-
		Moisture content (in-place)	-	"	"	"	"	"	-
		Fractured faces	-	AASHTO T 335	1 per 1000 tons	From windrow on roadbed after processing	Yes	4 hours	-
<b>Finished Product</b>									
Subbase, base, & surface course	Measured & tested for conformance (106.04)	Surface tolerance & grade	-	Subsection 301.06	As directed	Surface of final course	No	Before placement of next lift or as requested	-

(1) At least 5 points per proctor.

**Section 407. — CHIP SEAL**

**407.13 Acceptance.** Delete Table 407-3 and substitute the following:

**Table 407-3  
Sampling, Testing, and Acceptance Requirements**

Material or Product (Subsection)	Type of Acceptance (Subsection)	Characteristic	Category	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time	Remarks
<b>Source</b>									
Chip seal aggregate <sup>(1)</sup> (703.09)	Measured & tested for conformance (106.04 & 105)	Quality	–	Subsection 703.09	1 per material type	Source of material	Yes	Before producing	–
	Process control (153.03)	Gradation	–	AASHTO T 27 & T 11	2 per day per stockpile	Crusher belt (during production)	No	24 hours	Not required if using a pre-crushed commercial source
Blotter (703.12)	"	"	–	Subsection 703.12	"	"	"	"	–
Asphalt binder <sup>(2)</sup> (702.01) or emulsified asphalt <sup>(2)</sup> (702.02)	Measured & tested for conformance (106.04)	Quality	–	Section 702	1 per material type	Point of shipment or delivery	Yes <sup>(4)</sup>	Before incorporating into work	–
<b>Production</b>									
Chip seal aggregate <sup>(1)</sup> (703.09)	Statistical <sup>(3)</sup> (106.05)	Gradation (See Table 703-5 for applicable sieves)	I	AASHTO T 27 & T 11	(3)	Spreader discharge	Yes	24 hours	–
	Process control (153.03)	Moisture on surface of aggregates	–	Visual inspection (407.10)	Contractor determined	Stockpile or spreader discharge	No	Before incorporating into work	–
Asphalt binder <sup>(2)</sup> (702.01) or emulsified asphalt <sup>(2)</sup> (702.02)	Measured & tested for conformance (106.04)	Quality	–	Section 702	1 per tanker truck including trailer	Tanker or Distributor	Yes <sup>(4)</sup>	–	Tested by Government
	Process control (153.03)	Placement temperature	–	–	1 per distributor truck minimum	Distributor truck	No	Before incorporating into work	–

(1) Applies to each aggregate grade provided.

(2) Applies to each asphalt material provided.

(3) For plan quantities less than 40,000 square yards, material will be accepted according to Subsection 106.03. For plan quantities equal to or greater than 40,000 square yards, material will be accepted according to Subsection 106.05. For plan quantities between 40,000 and 240,000 square yards, the sampling frequency will be determined by dividing the plan quantity by eight. If plan quantity exceeds 240,000 square yards, the sampling frequency will be one every 30,000 square yards.

(4) Two 1-quart samples for asphalt binder. One 1-gallon sample for emulsified asphalt.

**Section 501. — MINOR CONCRETE PAVEMENT**

**501.03 Composition (Concrete Mix Design).** Delete Table 501-1 and substitute the following:

**Table 501-1  
Composition of Concrete**

<b>Maximum Water/Cementitious Material Ratio</b>	<b>Maximum Slump AASHTO T 119, inch</b>	<b>Minimum Air Content, percent</b>	<b>Maximum Coarse Aggregate Size AASHTO M 43, inch<sup>(1)</sup></b>	<b>Minimum 28-Day Compressive Strength AASHTO T 22, pounds per square inch</b>
0.45	4 (fixed form)	5.0	1½	4000

(1) Meet size number gradation and requirements from AASHTO M 43 for coarse aggregates. Blending of standard sizes to optimize gradation is allowed.

**Section 552. — STRUCTURAL CONCRETE**

**552.03(a)(12)(c) Hydration stabilizing admixtures.** Delete this Subsection and substitute the following:

*(c) Hydration stabilizing admixtures.* Hydration stabilizing admixtures may be used to extend the allowable delivery time for concrete. Base the dosage on the time needed to delay the initial set of the concrete for delivery and discharge on the job. Include the design discharge time limit shown in Table 552-4.

**552.03(a) Structural Concrete.** Delete Subsection (17) and substitute the following:

(17) Reserved.

**552.03(a) Structural Concrete.** Delete Subsection (23) and substitute the following:

(23) Specified design strength and required average strength ( $f'_{cr}$ ) for the concrete mixture at 28 days as determined by the process described in Section 4 of ACI 301. This process and associated calculations are outlined on Form FHWA 1608. Pending 28-day strength results, a mix design may be approved on the basis that 7-day compressive strength results are at least 85 percent of the required average strength ( $f'_{cr}$ ) at 28 days;

**Section 554. — REINFORCING STEEL**

**554.08 Placing and Fastening.** Delete the fourth sentence of the fourth paragraph and substitute the following:

Place reinforcing steel in deck slabs within  $\pm\frac{1}{4}$  inch of the vertical plan location.

**Section 555. —STEEL STRUCTURES**

**555.16(f)(7)(b)** Threaded fasteners. Delete the first paragraph and substitute the following:

Use an inspection torque wrench to verify tensioning unless DTI devices are used.

**Section 560. — REMOVAL OF CONCRETE BY HYDRODEMOLITION**

**560.04 General.** Delete the third paragraph and substitute the following:

Dispose of wastewater and debris according to Subsection 203.07.

**Section 569. — CONCRETE OVERLAYS FOR BRIDGE DECKS**

**569.04 Composition (Concrete Mix Design).** Delete Table 569-1 and substitute the following:

**Table 569-1  
Composition of Concrete**

Concrete Overlay Class	Property				Performance Characteristics			
	Total Cementitious Material Content, pounds per cubic yard <sup>(1)</sup>	Maximum Water/Cementitious Material Ratio <sup>(4)</sup>	Slump, inches	Air Content, percent	Coarse Aggregate Size Number AASHTO M 43 <sup>(5)</sup>	Minimum Apparent Surface Resistivity at 28 days, AASHTO T 358 (4 by 8 inch cylinder), kΩ.cm	Minimum Bond Strength at 14 days, ASTM C1583, pounds per square inch	Minimum Compressive Strength at 28 days, AASHTO T 22, pounds per square inch
HPC(O) <sup>(2)</sup>	564 to 750	0.45	2 to 8	<a href="#">Table 552-1</a>	7, 78, 8	27	150	4500
LMC <sup>(3)</sup>	564 to 750	0.45	2 to 8	3.0 to 10.0	7, 78, 8	27	150	4000

- (1) The total cementitious material content includes portland cement and pozzolans added to the concrete mixture (such as ground granulated blast furnace slag, fly ash, and silica fume). Meet the requirements shown in Table 552-2.
- (2) Add 1.5 gallons per cubic yard of concrete of an approved Shrinkage Reducing Admixture (SRA).
- (3) Add 3.5 gallons of latex emulsion admixture per 94 pounds of cement.
- (4) Include the water contained in the aggregate above the amount of absorbed water in the calculation of the water-to-cementitious material ratio.
- (5) Meet the processing requirements of AASHTO M 43, Table 1 – Standard Sizes of Processed Aggregate.
- (6) AASHTO T 277 may be used instead of AASHTO T 358. If using AASHTO T 277, convert test results to AASHTO T 358 results using S=5801.2(RCP)-0.819.

**569.16 Concrete Curing.** Add the following:

Only allow construction traffic for placement of bridge overlay on the bridge deck for the first 7 days of curing.

**569.16 Concrete Curing.** Delete the fifth paragraph and substitute the following:

Minimum apparent surface resistivity will be evaluated under Subsection 106.05. The specification limit is the shown in Table 569-1. A single surface resistivity test result is the average result from 3 samples cast from the same load and tested.

**569.18 Acceptance.** Delete Table 569-2 and substitute the following:

**Table 569-2  
Sampling, Testing, and Acceptance Requirements**

Material or Product (Subsection)	Type of Acceptance (Subsection)	Characteristic	Category	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time	Remarks
<b>Source</b>									
Aggregate (fine & coarse)	Measured & tested for conformance ( <a href="#">106.04</a> & <a href="#">105</a> )	Quality	-	<a href="#">Subsection S 703.01</a> & <a href="#">703.02</a>	1 per material type	Source of material	Yes, if requested	Before producing	Date reports within 1 year of intended use
<b>Mix Design</b>									
Concrete composition	Measured & tested for conformance ( <a href="#">106.04</a> & <a href="#">105</a> )	All	-	<a href="#">Subsection 569.04</a>	1 per mix design	Source of material	Yes, if requested	Before producing	-
<b>Production Start-up (Test Section)</b>									
HPC(O)	Measured & tested for conformance ( <a href="#">106.04</a> )	Minimum apparent surface resistivity <sup>(1)</sup>	-	AASHTO T 358	1 set per test placement	Discharge stream at point of placement <sup>(1)</sup>	Yes, if requested	Upon completing tests	-
		Compressive strength <sup>(2)</sup>	-	AASHTO T 23 & 22	"	"	"	"	-
		Tensile bond strength	-	ASTM C1583	5 cores per test placement	In-place after curing is complete	"	"	-
LMC	Measured & tested for conformance ( <a href="#">106.04</a> )	Minimum apparent surface resistivity <sup>(1)</sup>	-	AASHTO T 358	1 set per test placement	Discharge stream at point of placement	Yes	Upon completing tests	-
		Compressive strength <sup>(3)</sup>	-	AASHTO T 23 & 22	"	"	"	"	-
		Tensile bond strength <sup>(7)</sup>	-	ASTM C1583	5 cores per test placement	In-place after curing is complete	"	"	-
HPC(O) and LMC	"	Density <sup>(4)</sup>	-	AASHTO T 121	1 per load	Point of discharge	No	Upon completing tests	-
		Air content <sup>(4)</sup>	-	AASHTO T 152 or AASHTO T 196	"	"	"	"	-
		Slump <sup>(4),(5)</sup>	-	AASHTO T 119	"	"	"	"	-
		Temperature	-	Field measured	"	"	"	"	-

**Table 569-2 (continued)  
Sampling, Testing, and Acceptance Requirements**

Material or Product (Subsection)	Type of Acceptance (Subsection)	Characteristic	Category	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time	Remarks
<b>Production Start-up (Test Section) (continued)</b>									
Aggregate (fine & coarse)	Measured & tested for conformance (106.04)	Gradation	-	AASHTO T 27 & T 11	1 per day	Flowing aggregate stream (bin, belt, discharge conveyor belt, or stockpile)	Yes	Before batching	-
		Fineness modulus	-	AASHTO T 27	-	"	"	"	-
		Moisture test	-	AASHTO T 255	-	"	"	"	-
<b>Production</b>									
HPC(O) & LMC	Statistical (106.05)	Minimum apparent surface resistivity <sup>(1)</sup>	II	AASHTO T 277	1 set per 30 yd <sup>3</sup> but not less than 1 per day	Discharge stream at point of placement	Yes	Upon completing tests	-
		Compressive strength <sup>(6)</sup>	II	AASHTO T 23 & T 22	"	"	"	"	-
		Tensile bond strength <sup>(7)</sup>	II	ASTM C1583	1 set per 3000 ft <sup>2</sup> of overlay but not less than 1 per day	In-place after curing is complete	No	"	-
HPC(O) & LMC	Measured & tested for conformance (106.04)	Density <sup>(4)</sup>	-	AASHTO T 121	1 per load	Point of discharge	No	Upon completing tests	-
		Air content <sup>(4)</sup>	-	AASHTO T 152 or AASHTO T 196	"	"	No	"	-
		Slump <sup>(4),(5)</sup>	-	AASHTO T 119	"	"	"	"	-
		Temperature	-	ASTM C1064	"	"	"	"	-

**Table 569-2 (continued)  
Sampling, Testing, and Acceptance Requirements**

Material or Product (Subsection)	Type of Acceptance (Subsection)	Characteristic	Category	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time	Remarks
<b>Production (continued)</b>									
Aggregate (fine & coarse)	Measured & tested for conformance (106.04)	Gradation	-	AASHTO T 27 & T 11	1 per day	Flowing aggregate stream (bin, belt, discharge conveyor belt, or stockpile)	Yes, if requested	Before batching	-
		Fineness modulus	-	AASHTO T 27	-	"	"	"	-
		Moisture test	-	AASHTO T 255	-	"	"	"	-

- (1) Cast at least three 4- by 8-inch minimum apparent surface resistivity cylinders per set and carefully transport the cylinders to the job site curing facility. Cure the HPC(O) cylinders according to AASHTO M 201. Test for surface resistivity at 28 days according to AASHTO T 358. The test result is the average of the measurements on three cylinders cast from the same load. If pigment is used in the concrete mixture, sample concrete at the batch plant before and after adding pigment. Test at least three specimens with and without pigment. Determine the average difference between the pigmented and non-pigmented test results. Adjust production test results by the average difference. Report both initial and adjusted test results. After completion of resistivity testing, at 28 days the same cylinders may be used for compressive strength testing.
- (2) For HPC(O), cast at least fifteen 4- by 8-inch compressive strength cylinders per set and carefully transport the cylinders to the job site curing facility. Test three cylinders each at 1, 3, 7, 14 and 28 days. A single compressive strength test result is the average result from three cylinders cast from the same load.
- (3) For LMC, cast at least eighteen 4- by 8-inch compressive strength cylinders per set and carefully transport the cylinders to the job site curing facility. Test three cylinders each at 1, 2, 4, 7, 14 and 28 days. A single compressive strength test result is the average result from three cylinders cast from the same load.
- (4) For LMC, measure density, slump, and plastic air content 5 minutes after discharge from the mixer chute. Cover wheelbarrow or other receptacle used to hold sample with a sheet of plastic to prevent evaporation during the 5 minutes before sampling.
- (5) If reinforcing fibers are used at an addition rate greater than 0.3 percent by volume, measure slump at the batch plant before adding fibers.
- (6) Cast at least six 4- by 8-inch compressive strength cylinders per set and carefully transport the cylinders to the job site curing facility. Test three cylinders at 28 days. Use the remainder of cylinders as directed.
- (7) At random locations determined by the CO, core 2-inch diameter specimens through the overlay and ½ inch into the substrate concrete. Cure the specimens in situ for the same length of time as the overlay. Test the specimens in situ by attaching a loading disk with fast setting, high strength epoxy. Measure the tensile pull-off bond strength in pounds per square inch according to ASTM C1583. The average bond strength is the average of the results from three test specimens adjusted as follows: For tests where failure occurs in the substrate concrete at a depth of at least ¼ inch for more than 50 percent of the specimen, use 150 pounds per square inch for that specimen test result in the calculation of the average of the three test specimens. When two of the three test results have been adjusted, the average bond strength results use the greater of 150 pounds per square inch or the calculated value.

## Section 572. —CONCRETE REPAIR

**572.03(a) Hydraulic cement concrete.** Delete Tables 572-1 and 572-2 and substitute the following:

**Table 572-1  
Composition of Repair and High Early Strength (HES) Concrete**

Class of Concrete <sup>(1)</sup>	Early Age 48-Hour Design Compressive Strength, AASHTO T 22, pounds per square inch	28-Day Design Compressive Strength, AASHTO T 22, pounds per square inch	Plastic Air Content, percent minimum <sup>(2)</sup>	Maximum Water/Cementitious Material Ratio <sup>(4)</sup>	Slump, inches <sup>(3)</sup>	Nominal Maximum Size Aggregate, AASHTO M 43
Repair	2000	4500	5.0	0.45	±1 from provided target	#67 or #78
HES	3000	5000	5.0	0.40	±1 from provided target	#67 or #78

(1) Conform to ASTM C1157 for portland cement in concrete.

(2) Measure plastic air content according AASHTO T 152 Method B. Maximum plastic air content is 9 percent.

(3) Conform to the supplier provided target slump. Maximum slump is 8 inches if approved mix design includes a high-range water reducer.

(4) If supplementary cementitious materials are used, conform to Table 552-2 limits.

**Table 572-2  
Composition of Very High Early Strength (VHES) Concrete**

Class of Concrete <sup>(1)</sup>	Early Age 4-Hour Design Compressive Strength, AASHTO T 22, pounds per square inch	28-Day Design Compressive Strength, AASHTO T 22, pounds per square inch	Freeze Thaw Resistance, ASTM C666 Method A (minimum)	Maximum Water/Cementitious Material Ratio	Slump, inches <sup>(3)</sup>	Nominal Maximum Size Aggregate, AASHTO M 43
VHES	3000	5000	RDME <sup>(2)</sup> > 96%	0.42	±1 from provided target	#67 or #78

(1) Conform to ASTM C1600 Class URH or Class VRH for hydraulic cement in concrete.

(2) Relative dynamic modulus of elasticity (RDME) measured according to ASTM C666.

(3) Conform to the supplier provided target slump.



## **Section 628. — TEMPORARY STREAM DIVERSIONS**

**628.05(d) Bypass pumping diversion.** Delete the third sentence and substitute the following:

Place a mesh screen over the intake with a maximum mesh size of  $3/32$  inch.

## **Section 629. — ROLLED EROSION CONTROL PRODUCTS AND CELLULAR CONFINEMENT SYSTEMS**

**629.06(a)(3) Check slot.** Delete this Subsection and substitute the following:

**(3) Check slot.** Install two rows of fasteners 4 inches apart on 4-inch centers across the top edge of the RECP. Drive fasteners flush with soil surface.

**629.06(b) Channel installations.** Delete the second paragraph and substitute the following:

Securely fasten RECP to the soil by installing fasteners at a minimum rate of 2 per square yard. Significantly higher anchor rates may be necessary in sandy, loose, or wet soils and in severe applications.

**629.07 Cellular Confinement Systems.** Delete the first paragraph and substitute the following:

Excavate to the depth of the cellular confinement system and smooth and compact the slope. Install the top of the system flush or lower than the adjacent slope. Expand the geocell down the slope. Connect adjacent geocell sections with fasteners in every other cell.

## **Section 634. — PERMANENT PAVEMENT MARKINGS**

**634.03 General.** Delete the ninth paragraph and substitute the following:

Marking materials meeting state department of transportation specifications in which the project is located may be used if approved.

**Section 637. — FACILITIES AND SERVICES**

**637.03(b) Residential housing.** Delete Table 637-2 and substitute the following:

**Table 637-2  
Minimum Facility Furnishings**

Property	Field Office, Each	Residential Housing, Each
Table, wood or like, 96 inches L x 30 inches W x 30 inches H	3	–
File cabinet, 2-drawer, fire-resistant, metal, with lock and keys	1	–
File cabinet, 4-drawer, metal	1	–
Desk, wood or like, 60 inches L x 30 inches W x 30 inches H <sup>(1)</sup>	2	–
Desk lamp <sup>(1)</sup>	2	–
Office chair <sup>(1)</sup>	5	–
Storage cabinet, 72 inches H x 36 inches W x 18 inches D	1	–
Fire extinguisher	1	2
Refrigerator, 18-cubic foot	1	1
Range and oven, standard 36-inch	–	1
Microwave oven, 1.1 cubic foot, 1100 watt	1	1
Kitchen table with 4 chairs, wood or like, 60 inches L x 36 inches W x 30 inches H, minimum	–	1 set
Sofa, 90 inches L x 38 inches W x 34 inches H, minimum	–	1
Coffee table, 36 inches L x 18 inches W x 16 inches H, minimum	–	1
Recliner chair	–	2
End table, 28 inches L x 17 inches W x 20 inches H, minimum	–	3
Table lamp, 26 inches H, minimum	–	3
Queen bed with frame, mattress, and box spring as necessary	–	2
Nightstand, 20 inches L x 20 inches W x 25 inches H, minimum	–	4
Nightstand lamp, 26 inches H, minimum	–	4
Dresser, six-drawer, wood or like	–	2
Television, 40-inch	–	✓
Laundry (washer and dryer)	–	✓
Vacuum cleaner, bagless, 12amp	–	✓

(1) Meet accepted industry standards for ergonomics.

## Section 701. — CEMENTITIOUS MATERIAL

**701.05(b) Packaged repair mortar.** Delete Subsection (2) and substitute the following:

- (2) Length change, ASTM C157, except cure according to ASTM C928 when using rapid-hardening mortar. 0.07 percent maximum

## Section 703. — AGGREGATE

**703.05(b) Subbase or base course aggregate.** Delete Table 703-1 and substitute the following:

**Table 703-1  
Target Value Ranges for Subbase, Base, and Surface Course Gradation**

Sieve size	Percent by Mass Passing Designated Sieve (AASHTO T 27 & T 11)							
	Grading Designation <sup>(1)</sup>							
	Subbase		Base				Surface	
	A	B	C	D	E	F	G	H
2½ in	100	—	—	—	—	—	—	—
2 in	97 to 100	100	100	—	—	—	—	—
1½ in	—	97 to 100	—	—	—	—	—	—
1 in	65 to 79	—	80 to 100	100	100	—	100	—
¾ in	—	—	64 to 94	86 to 100	86 to 100	100	—	100
½ in	45 to 59	—	—	—	—	—	70 to 80	—
⅜ in	—	—	40 to 69	51 to 82	51 to 82	62 to 90	—	—
No. 4	28 to 42	40 to 60	31 to 54	36 to 64	36 to 64	36 to 74	40 to 50	41 to 71
No. 10	—	—	—	—	—	—	25 to 40	—
No. 40	9 to 17	—	—	12 to 26	12 to 26	12 to 26	15 to 25	12 to 28
No. 200	4.0 to 8.0	4.0 to 12.0	4.0 to 7.0	4.0 to 7.0	10 max <sup>(2)</sup>	4.0 to 7.0	8.0 to 14.0	9.0 to 16.0

(1) Contractor specified target values. See [Table 703-2](#) for allowable deviations.

(2) Statistical procedures do not apply.

**703.07 Asphalt Concrete Aggregate.** Delete this Subsection and substitute the following:

**703.07 Asphalt Concrete Aggregate.** Provide hard, durable particles or fragments of crushed stone, crushed slag, or crushed gravel conforming to the following:

- (a) Los Angeles abrasion, AASHTO T 96 35 percent maximum
- (b) Soundness of aggregate using sodium sulfate, AASHTO T 104 (5 cycles):
- (1) Coarse aggregate 12 percent loss maximum
- (2) Fine aggregate 12 percent loss maximum
- (c) Fractured faces, AASHTO T 335 (one or more) 90 percent minimum
- (d) Fine aggregate angularity, AASHTO T 304, Method A 40.0 percent minimum

- (e) Flat and elongated particles, ASTM D4791 (1:5 ratio, plus 3/8-inch sieve, calculated by mass, weighted average) 10 percent maximum
- (f) Sand equivalent, AASHTO T 176, Alternative Method No. 2, Reference Method 45 minimum
- (g) Gradation. See [Table 703-3](#)

For the surface course, do not use aggregates known to polish or carbonate aggregates containing less than 25 percent by mass of insoluble residue when tested according to ASTM D3042.

**Table 703–3  
Asphalt Concrete Aggregate Gradation**

Sieve Size	Nominal Maximum Aggregate Size – Percent Passing <sup>(1)</sup>									
	Grading Designation <sup>(2)</sup>									
	1 inch		3/4 inch		1/2 inch		3/8 inch		No. 4	
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
1 1/2 in	100	–	–	–	–	–	–	–	–	–
1 in	90	100	100	–	–	–	–	–	–	–
3/4 in	–	90	90	100	100	–	–	–	–	–
1/2 in	–	–	–	90	90	100	100	–	–	–
3/8 in	–	–	–	–	–	90	90	100	100	–
No. 4	–	–	–	–	–	–	–	90	95	100
No. 8	19	45	23	49	28	58	32	67	70	80
No. 16	–	–	–	–	–	–	–	–	–	–
No. 30	–	–	–	–	–	–	–	–	–	–
No. 50	–	–	–	–	–	–	–	–	–	–
No. 200	1.0	7.0	2.0	8.0	2.0	10.0	2.0	10.0	4.0	10.0

(1) Size, grade and combine the aggregate fractions in mix proportions that result in a composite blend conforming to the specified gradation. Nominal maximum size is one sieve size greater than the first sieve to retain more than 10 percent of the combined aggregate. Test according to AASHTO T 27 and AASHTO T 11

(2) Contractor specified target values. Provide target values for all sieves designated in [Table 703-3](#). See [Table 703-2](#) for allowable deviations.

**703.09 Chip Seal Aggregate.** Delete Subsection (c) and substitute the following:

- (c) Flat and elongated particles, ASTM D4791 (1:3 ratio, plus 3/8-inch sieve, calculated by mass, weighted average) 10 percent maximum

## Section 712. — JOINT MATERIAL

**712.01 Sealants, Fillers, and Seals.** Delete Subsections (h) and (i) and substitute the following:

**(h) Pre-compressed foam-supported silicone joint seal.** Provide a joint system comprised of the following:

- (1) Cellular polyurethane foam impregnated with hydrophobic 100 percent acrylic, water-based emulsion, factory coated with highway-grade, fuel resistant silicone conforming to Table 712-3.
- (2) Field-applied epoxy adhesive primer conforming to Table 712-4.
- (3) Field-injected silicone sealant bands conforming to Table 712-5.

**Table 712-3  
Impregnated Foam Requirements**

Property	Test Method	Minimum Requirement
Base material	–	Cellular, high density, polyurethane foam
Tensile strength	ASTM D3574	18 psi
UV and moisture resistance	ASTM G155	No changes - 2000 hours, Pass
Density	ASTM D545	4 lb./cu. ft.
Elongation	ASTM D3574	125%
Temperature service range	ASTM C711	-40 to 185 °F

**Table 712-4  
Epoxy Adhesive Requirements**

Property	Test Method	Minimum Requirement
Tensile strength	ASTM D638	3500 psi
Shear strength	ASTM D732	3000 psi
Bond strength	ASTM D882	2500 psi
Compressive strength	ASTM D695	8000 psi

**Table 712-5  
Silicone Sealant Bands Requirements**

<b>Property</b>	<b>Test Method</b>	<b>Requirement</b>
Color	Visual	Black
Movement capability	ASTM C719	±50%
Elongation	ASTM D412	> 600%
Tensile strength	ASTM D412	≥ 100 psi

**(i) Reserved.**

### **Section 714. — GEOSYNTHETIC MATERIAL**

**714.01(d) Paving geotextile.** Delete this Subsection and substitute the following:

**(d) Paving geotextile.** Provide geotextile conforming to AASHTO M 355, Table 1, Type II.

**714.01 Geotextile.** Add the following:

**(e) Subgrade stabilization geotextile.** Conform to AASTHO M 288 Table 11, Class 4A.

**714.03 Stabilization Geogrid.** Delete this Subsection and substitute the following:

**714.03 Stabilization Geogrid.** Provide biaxial geogrid conforming to AASHTO M 288, Table 11, Class 4C.

**714.04 Reinforcement Geotextile and Geogrid.** Delete the first paragraph and substitute the following:

Provide reinforcement geotextile and geogrids conforming to AASHTO M 288, Table 8 and 9, and Table 714-2.

**714.06 Geosynthetic Reinforce Soil Reinforcement.** Delete the first paragraph and substitute the following:

Provide reinforcement geotextile and geogrids conforming to AASHTO M 288, Table 8 and 9, and Table 714-4.

### **Section 718. — TRAFFIC SIGNING AND MARKING MATERIAL**

**718.09 Waterborne Pavement Markings.** Delete Subsections (a), (b), and (i).