

Section 601. — MINOR CONCRETE

Description

601.01 This work consists of constructing minor concrete.

Material

601.02 Conform to the following Section and Subsections:

Coarse aggregate for concrete	703.02
Color coating	725.15
Concrete curing material and additives	711
Fine aggregate for concrete	703.01
Hydraulic cement	701.01
Penetrating stain for concrete	719.05
Pozzolans	701.03
Reinforcing steel	709.01
Sealants, fillers, and seals	712.01
Water for cementitious materials	725.01(a)

Construction Requirements

601.03 Composition (Concrete Mix Design). Conform to [Table 601-1](#). Before batching concrete, submit the proposed concrete proportions for approval on Form FHWA 1606, *Minor Portland Cement Concrete Mix Design* or other approved form. As a minimum, submit the following at least 30 days before production:

(a) Concrete. Include the following in each mix design submittal:

- (1) Type and sources of material;
- (2) Material certification for material;
- (3) Saturated surface dry mass of the fine and coarse aggregate per cubic yard of concrete;
- (4) Gradation of fine and coarse aggregate;
- (5) Mass of mixing water per cubic yard of concrete;
- (6) Mass of cement per cubic yard of concrete. Fly ash, ground iron blast-furnace slag, or silica fume (micro-silica) may be substituted for cement according to [Table 552-2](#);
- (7) Entrained air content of plastic concrete in percent by volume; and
- (8) Maximum slump of plastic concrete in inches.

(b) Integral colored admixture. If integral color admixture is used, prepare five 2- by 2-foot test panels. Construct the test panels using the proposed mix design. Determine coloring agent batch amounts by weight. Use variable quantities of coloring agent as approved. Provide additional mixing

time according to the manufacturer's recommendations. Cure the test panels similar to the structure. Transport the panels to an approved location. Provide at least 2 weeks outside exposure. The CO will select the acceptable test panel. Use the same rate of integral color admixture for the item of work.

Table 601-1
Composition of Minor Concrete

Property	Specification
Water to cementitious material ratio	0.49 maximum
Air content	4% minimum
Size of coarse aggregate	AASHTO M 43 with 100% passing the 1½-in sieve
28-day compressive strength	4000 psi minimum

601.04 General. Excavate and backfill according to [Section 209](#).

Design and construct forms that are free of bulge and warp and allow for removal without injuring the concrete. Design the forms for a lateral pressure equal to that exerted by a fluid weighing 150 pounds per cubic foot.

Use wood, metal, or other suitable material for forms. Keep forms clean and coat with a form release agent or form oil before placing concrete.

Place and fasten reinforcing steel according to [Subsection 554.08](#).

601.05 Placing Concrete. Conform to [Subsection 552.07](#). Moisten the forms and foundation immediately before placing concrete. Discharge concrete within the time limit shown in [Table 552-5](#).

Place concrete to avoid segregation of material. Consolidate with vibrators according to [Subsection 552.08\(c\)](#). Do not use aluminum pipe for transporting or placing concrete. Do not exceed 30 minutes between deliveries of batches for a single pour on a structure.

Do not apply water to plastic concrete surfaces during finishing operations.

601.06 Curing and Finishing of Concrete. Cure concrete at least 7 days. Cure according to [Subsection 552.13](#). Finish exposed concrete surfaces according to [Subsection 552.14](#) as applicable.

Do not place backfill against concrete until 80 percent of the design strength is attained. Construction loads less than 4000 pounds may be placed on the concrete when 80 percent of the design strength is attained.

Remove and replace cracking, spalling, or scaling concrete to the nearest joint.

601.07 Acceptance. See [Table 601-2](#) for sampling, testing, and acceptance requirements.

Material for minor concrete including concrete, reinforcing steel, and structural steel for minor structures will be evaluated under [Subsections 106.02](#) and [106.03](#).

The concrete mixture's density, air content, slump, temperature, and compressive strength will be evaluated under [Subsections 106.02](#) and [106.04](#).

Section 601

Construction of minor concrete will be evaluated under [Subsections 106.02](#) and [106.04](#).

Excavation and backfill will be evaluated under [Section 209](#).

Measurement

601.08 Measure the [Section 601](#) pay items listed in the bid schedule according to [Subsection 109.02](#) and the following as applicable:

When concrete is measured by the cubic yard, measure in the structure.

Payment

601.09 The accepted quantities will be paid at the contract price per unit of measurement for the [Section 601](#) pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See [Subsection 109.05](#).

Table 601-2
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
Source									
Aggregate (fine & coarse)	Measured & tested for conformance (106.04 & 105)	Quality	–	Subsections 703.01 & 703.02	1 per material type	Source of material	Yes	Before producing	–
Mix Design									
Concrete composition (601.03)	Measured & tested for conformance (106.04 & 105)	All	–	Subsection 601.03	1 per mix design	Source of material	If requested	Before producing	–
Production									
Concrete ⁽¹⁾	Measured & tested for conformance (106.04)	Density	–	AASHTO T 121	1 per load after 0.25 yd ³ minimum is discharged ⁽⁴⁾	Point of discharge	No	Upon completing tests	–
		Air content	–	AASHTO T 152 or AASHTO T 196	"	"	"	"	–
		Slump	–	AASHTO T 119	"	"	"	"	–
		Temperature	–	ASTM C1064	"	"	"	"	–
		Compressive Strength ^{(2),(3)} (28-day)	–	AASHTO R 100 & T 22	1 set per 30 yd ³ but not less than 1 per day	"	Yes	28 days	Deliver verification cylinders to the CO or designated laboratory for scheduled testing

Table 601-2 (continued)
Sampling, Testing, and Acceptance Requirements

(1) Sample according to AASHTO R 60, except composite samples are not required.
(2) Cast at least four compressive strength test cylinders for 6- by 12-inch specimens or six compressive strength cylinders for 4- by 8-inch and carefully transport the cylinders to the job site curing facility.
(3) A single compressive strength test result is the average result from two 6- by 12-inch or three 4- by 8-inch cylinders cast from the same load.
(4) If three successive samples are tested and compliance to the specifications is indicated, screening tests may be reduced to an approved frequency. Resume Table 601-2 testing frequency if a test shows a failing temperature, air content, slump, or when directed.