

ALABAMA DEPARTMENT OF TRANSPORTATION

General Application Special Provision

DATE: January 22, 2024

GASP No. 22-GA0037

EFFECTIVE DATE: April 1, 2024

SUBJECT: Structural Portland Cement Concrete.

Alabama Standard Specifications, 2022 Edition, SECTION 501 shall be amended as follows:

SECTION 501 STRUCTURAL PORTLAND CEMENT CONCRETE

501.02 Materials.

(c) Proportioning Materials.

10. Concrete Production.

Item 501.02(c)10 shall be replaced with the following:

10. Concrete Production.

During the progress of the work, the relative proportions between the fine and coarse aggregates, and between aggregate and water, may be varied as needed for best results, but the water to total cementitious material ratio shall not be changed except as noted below:

If it is impossible to produce concrete having the desired consistency the total amount of cementitious material may be increased to achieve the desired consistency provided that the maximum water to total cementitious material ratio is not exceeded and there is no additional cost to the Department.

If the Engineer finds it advisable to increase the minimum design strength of the concrete and orders the cementitious factor increased, the State will reimburse the Contractor for the actual amount only of the additional cementitious material used, based on actual f.o.b. destination, with the additional quantity calculated from the theoretical cementitious factor determined by the Engineer and not from count of bags or weight {mass} used.

The concrete mixture designs shall use Type I, Type II, Type IL, Type IP, or Type IS portland cement unless otherwise specified. The Contractor may, for his own convenience and without additional compensation, substitute Type III portland cement, provided prior approval is given by the Materials and Tests Engineer.

It shall be the Contractor's responsibility to carry out uniform construction practices, which will produce concrete with the specified plastic concrete properties and of not less than the minimum specified compressive strength. Concrete with compressive strength below the minimum specified compressive strength will be investigated in accordance with ALDOT-170 prior to repairing or removing the affected concrete. Should low compressive strength occur consistently, the Materials and Tests Engineer may order corrective action as deemed necessary, without additional cost to the Department.

Where the conditions require the use of low tricalcium aluminate cement, the plans or proposal will designate Type II portland cement. In such case, if requested and approved in writing, Type I, Type IL, Type IP, or Type IS blended cement containing a maximum of eight percent tricalcium aluminate may be used. Should Type III portland cement be permitted, a maximum of eight percent tricalcium aluminate shall still apply.

(d) Sampling and Inspection.

Subarticle 501.02(d) shall be replaced with the following:

(d) Sampling and Inspection.

Production of required aggregate gradation in the concrete mixture shall be the Contractor's responsibility.

Cement, aggregates, water, and chemical and mineral admixtures shall be accepted on the basis of requirements currently listed in the Department's Testing Manual.

The Department reserves the right to take samples of aggregates from stockpiles, cementitious materials from storage bins, and chemical admixtures from storage tanks at the mixing or batching plant and to make further tests as needed as the basis for continued acceptance of the materials.

The Contractor shall furnish, without extra compensation, samples of the materials and the concrete mixture for making tests and test cylinders as required to comply with the Department's Testing Manual. Additional testing may be required if deemed necessary by the Engineer.

The Contractor shall furnish for all concrete test cylinders produced, without extra compensation, a cylinder curing box equipped with heating/cooling capabilities, a water circulation pump, and automatic temperature control capable of maintaining a water temperature range from 60°F to 80°F {16°C to 27°C}. The cylinder curing box shall be on a level surface with the supporting surface on which the cylinders are stored level within 0.25 inch/ft {20 mm/m} and available at each site when concrete is placed. The water in the cylinder curing box shall range from 60°F to 80°F {16°C to 27°C} prior to the addition of any concrete cylinder. Only plastic molds shall be used for concrete cylinders to be immersed in water. The Engineer, prior to beginning any concrete placement, shall approve each cylinder curing box.

The Contractor shall be responsible for providing continuous power (wall power or generator) for the cylinder curing box during the initial curing period of cylinders. The Contractor shall also be responsible for providing fuel if a generator is used to power the cylinder curing box.

The Engineer shall be responsible for ensuring that no sample is taken before 10 percent or after 90 percent of the batch has been discharged; however, if this is not practical, then no less than 6 cubic feet or 0.2 cubic yards {0.2 cubic meter} of concrete (e.g., approximately two, half-full wheelbarrow loads) shall be discharged from the truck before sampling to remove non-representative concrete.

Immediately after being struck off and sealed with tight-fitting plastic lids, the concrete test cylinders shall be moved to the cylinder curing box where they shall remain for an initial curing period of not less than 24 hours or more than 72 hours. During the initial curing period, the cylinders shall be stored in the cylinder curing box with the water temperature range from 60°F to 80°F {16°C to 27°C} for up to 72 hours. The water inside the cylinder curing box shall not be allowed to drop more than 2 inches {50 mm} from the top of any cylinder after the cylinders have been placed in the curing box.

The Contractor shall be responsible for providing temperature probes that continuously record the water temperature in the cylinder curing box at intervals of 30 minutes or less and shall provide documentation of the temperature record to the Engineer. The Engineer, prior to beginning any concrete placement, shall approve the temperature probes used to measure the water temperature in the cylinder curing box.

Concrete cylinders are to be transported to the laboratory for final curing within 72 hours after molding. During transportation, protect the cylinders with suitable cushioning material to prevent damage from jarring. During cold weather, protect the cylinders from freezing with suitable insulation material. Prevent moisture loss during transportation by leaving the tight-fitting plastic lids on the plastic molds. Transportation time shall not exceed 4 hours. Upon arrival to the laboratory, the cylinders shall be removed from molds and within 30 minutes placed in final curing in accordance with AASHTO T 23 "Making and Curing Concrete Test Specimen in the Field". When retarding chemical admixtures delay the setting of the concrete beyond 16 hours, the concrete cylinders should not be moved too early and, in accordance with AASHTO T 23, the cylinders shall not be transported until at least 8 hours after final set as measured in accordance with AASHTO T 197.