

UPDATE LOG FOR TECHNICAL PROVISIONS – DIVISION 2		
Date	Item(s) Changed	Page #
12/1/15	<p>TECHNICAL PROVISIONS DIVISION 2- CONCRETE SPECIFICATIONS</p> <p>2.8 Proportioning and Mixing</p> <p>2.8.2.2 Transit Mixed Concrete</p> <p>The drum of the mixer shall be completely emptied of any previously mixed load. The proper proportions of the required ingredients for each load of concrete shall be placed in the mixer and shall be mixed between 70 and 100 revolutions at the manufacturer’s designated mixing speed unless otherwise approved by the Engineer. Additional revolutions of the drum shall be at the manufacturer’s designated agitating speed.</p> <p>Adequate control of ready-mixed concrete may require additional added water mixed into the batch at the discharge point. This water shall be mixed for a minimum of 30 revolutions at the manufacturer’s designated mixing speed. Water shall not be added to the load during transit.</p> <p>Concrete shall be delivered to the job site and discharged within 90 minutes after the addition of the cement to the aggregates or before the drum has revolved 100 250 revolutions, whichever occurs first.</p> <p>Each batch of transit mixed concrete delivered at the job site shall be accompanied by a ticket showing volume of concrete in cubic yards, weight of cement in pounds, quantity of water batched in gallons, quantity of water added at the job site in gallons, and the total weight of all ingredients in pounds. The ticket shall also show the time of day the materials were batched, when the truck arrived at the job site, and when all concrete was discharged. The ticket, or a legible copy thereof, shall be furnished to Owner.</p> <p>2.10 Construction Joints</p> <p>Construction joints shall be constructed as shown on the Construction Drawings and in accordance with Section 303-1.8.6 and Section 303-5.4 of the Standard Specifications.</p>	<p>2-4 and 2-5</p> <p>2-6</p>

Change Legend:

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DIVISION 2

CONCRETE SPECIFICATIONS

2.1 General

2.1.1 Scope

Contractor shall furnish all material, equipment, and labor and perform all operations necessary to construct the Portland cement concrete work specified.

2.1.2 Submittals

Prior to beginning work, Contractor shall submit the following to Owner:

- a. Concrete Design Mix
- b. Reinforcing Steel Placing Plan

2.2 Standards

Whenever "Standard Specifications" are used herein, they shall mean the Standard Specifications for Public Works Construction, latest edition, as published by Building News, Incorporated of Los Angeles, California.

2.3 Materials

2.3.1 General

Concrete shall consist of Portland cement, concrete aggregates, water, and admixtures (when permitted or specified).

2.3.2 Portland Cement

Cement shall conform to ASTM C150, Type II low alkali Portland cement, in accordance with Section 201-1.2.1 of the Standard Specifications.

2.3.3 Aggregate

Fine aggregates shall consist of sand conforming to Section 200-1.5.3 and Section 200-1.5.5 of the Standard Specifications.

Coarse aggregate shall consist of gravel conforming to Section 200-1.4 of the Standard Specifications.

2.3.4 Water

Water shall be clean and fresh. It shall be free from oil, acids, alkali, sewage, and organic or other deleterious matter and it shall conform to Section 201-1.2.3 of the Standard Specifications.

2.3.5 Admixtures

2.3.5.1 General

Admixtures shall conform to Section 201-1.2.4 of the Standard Specifications.

2.3.5.2 Air-Entraining Admixtures

Class A and Class B Concrete shall contain an air-entraining admixture. Said admixture shall provide an air content of 5% + 1%. Contractor shall provide tests by an approved laboratory to determine time-strength characteristics of the concrete mix with the admixture.

2.3.5.3 Water-Reducing and Retarding Admixtures

Class A concrete shall contain a water-reducing, set retarding admixture. The use of said admixture shall conform to the manufacturer's recommendation for dosage, re-dose, and point of addition. Water reducing, set-retarding admixture shall conform to ASTM C 494 (Type D) and said admixture shall be Masters Builders Inc. "Pozzolith 300R" or W. R. Grace & Company "Daratard 17," or "WRDA-79."

2.3.5.4 Calcium Chloride

Calcium Chloride shall not be added to concrete mix under any circumstances.

2.4 Concrete Classes

2.4.1 General

Concrete class will be specified on the Construction Drawings or in the Contract Documents.

Concrete Class	Designation	Maximum Slump	Use
A	560-C-3250	4-inch	Reinforced Concrete Construction
B	520-C-2500	4-inch	Unreinforced Concrete Slab Construction
C	450-C-2000	4-inch	Pipe Encasement, Anchor, and Thrust Block Construction
D	100-E-100	5-inch	Trench Backfill

The above designations are described in Section 201-1.1.1 and Section 201-1.1.2 of the Standard Specifications.

2.4.2 Combined Aggregate

The combined aggregates shall conform to Section 201-1.3.2.

2.4.3 Water

The maximum quantity of water shall conform to Section 201-1.3.3.

2.5 Form Work

2.5.1 Construction

Forms shall be of suitable material and of a type, size, shape, quality, and strength to insure construction as designed. Forms shall be true to line and grade, mortar tight, and sufficiently rigid to resist deflection during placing of the concrete. Contractor shall be responsible for the design and construction of said forms. Forms shall conform to Sections 303-1.3 through 303-1.6 of the Standard Specifications.

2.5.2 Form Surfaces

Form contract surfaces or form lining materials shall conform to the Schedule of Finishes. All exposed outside corners shall be chamfered $\frac{3}{4}$ ", unless specified otherwise.

2.5.3 Removal of Forms

Forms shall not be removed until the concrete has a minimum compressive strength of 2,000 psi. In any event, forms shall not be removed for a minimum period of ten (10) days after placement of concrete. Forms shall then be removed in such a manner as to insure the complete safety of the structure. As soon as the forms are removed, the surface of the concrete shall be carefully examined and any irregularities in the surface shall be repaired.

2.6 Reinforcement

2.6.1 General

Reinforcing bars shall conform to the requirements of ASTM A615, Grade 40 or 60. Wire fabric (mesh) reinforcement shall conform to the requirements of ASTM A185. Wire reinforcement shall conform to the requirements of ASTM A82. Reinforcement shall conform accurately to the dimensions and details shown on the Construction Drawings.

2.6.2 Fabrication and Placement of Reinforcement

Reinforcement shall be detailed, fabricated, placed, and supported in place, in accordance with the Manual of Standard Practice of the Concrete Reinforcing Steel Institute.

Reinforcement shall be secured in place with concrete or metal spacers. Metal spacers extending to the surface of the concrete or wooden supports shall not be used. Reinforcement shall be free from scale, rust, or coatings that will reduce the bond between reinforcement and concrete. Reinforcement splices shall not occur in areas of maximum stress and shall have a minimum lap of 30-bar diameters.

2.6.3 Inspection

Reinforcement shall be inspected and approved by Owner prior to placing concrete.

2.7 Preparation for Placing

Forms, soil bottoms, reinforcement, and all embedded items shall be inspected and approved by Owner before concrete is placed. Water and all foreign matter shall be removed from forms, excavation, and mixing and conveying equipment. Soil bottom shall be in a thoroughly moist, unsaturated condition when concrete is placed. Forms must be complete, all embedded items in place, and all material, personnel, and equipment required for placement, including standby vibrators, on the job site before placing operations are started.

2.8 Proportioning and Mixing

2.8.1 Proportioning

Aggregates and cement shall be proportioned by weight, in accordance with Section 201-1.3.1 of the Standard Specifications. The amount of water added shall take into account the free water in the aggregates. Said amount of water shall not exceed the amount necessary to permit practical placement and consolidation of the concrete.

2.8.2 Mixing

2.8.2.1 General

The concrete shall be mixed in accordance with Section 201-1.4 of the Standard Specifications.

2.8.2.2 Transit Mixed Concrete

The drum of the mixer shall be completely emptied of any previously mixed load. The proper proportions of the required ingredients for each load of concrete shall be placed in the mixer and shall be mixed between 70 and 100 revolutions at the manufacturer's designated mixing speed unless otherwise approved by the Engineer. Additional revolutions of the drum shall be at the manufacturer's designated agitating speed.

Adequate control of ready-mixed concrete may require additional added water mixed into the batch at the discharge point. This water shall be mixed for a minimum of 30 revolutions at the manufacturer's designated mixing speed. Water shall not be added to the load during transit.

Concrete shall be delivered to the job site and discharged within 90 minutes after the addition of the cement to the aggregates or before the drum has revolved 250 revolutions, whichever occurs first.

Each batch of transit mixed concrete delivered at the job site shall be accompanied by a ticket showing volume of concrete in cubic yards, weight of cement in pounds, quantity of water batched in gallons, quantity of water added at the job site in gallons, and the total weight of all ingredients in pounds. The ticket shall also show the time of day the materials were batched, when the truck arrived at the job site, and when all concrete was discharged. The ticket, or a legible copy thereof, shall be furnished to Owner.

2.9 Placing Concrete

2.9.1 General

Concrete shall be conveyed, deposited, and consolidated in accordance with Sections 303-1.8.1, 303-1.8.3, and 303-1-8.4 of the Standard Specifications.

2.9.2 Adverse Weather Conditions

2.9.2.1 Cold Weather Placement

Concrete shall not be placed when the atmospheric temperature is below 40°F. Concrete may be placed when the atmospheric temperature is 40°F, minimum, rising and expected to stay above 40°F until concrete has reached sufficient strength to resist freezing.

2.9.2.2 Hot Weather Placement

Concrete shall not be placed when the atmospheric temperature is above 100°F. When the maximum daytime temperatures are expected to exceed 90°F, the following steps shall be taken:

- (a) All materials and equipment shall be stored in the shade.
- (b) The time between the introduction of the cement to the aggregate and discharge of the concrete shall not exceed 60 minutes.
- (c) The temperature of the concrete shall not exceed 80°F.
- (d) Work area, forms, and reinforcing steel shall be lightly wetted just prior to placement of the concrete.
- (e) Special care shall be taken to prevent evaporation from exposed concrete surfaces immediately after placing or finishing.

2.10 Construction Joints

Construction joints shall be constructed as shown on the Construction Drawings and in accordance with Section 303-1.8.6 and Section 303-5.4 of the Standard Specifications.

2.11 Concrete Finishes

Contractor shall finish the concrete with a class of finish described below and as specified on the Construction Drawings or by Owner:

Class 1 - Troweled finish. Surface shall be steel-troweled to a hard, smooth finish. Dusting will not be permitted. Except where warped surfaces are indicated, slab shall be finished to a true plane surface, free from humps or sags.

Class 2 - Surface formed with new plywood or approved form liner. No fins permitted.

Class 3 - Surface formed with new or reused (in good condition) plywood, finished tongue and groove, or matched boards. Fins to be removed.

Class 4 - Surface formed as specified for Class 3, or with rough boards, or with plywood in good condition.

Class 5 - Wood float finish. Surface shall be true to grade and free from humps or sags. Tamper and float marks shall be floated out.

Class 6 - Broom finish. Surface shall be floated to grade, then permitted to take set. It shall then be given a uniform texture by raking with an approved broom, as directed by Owner.

2.12 Curing

Concrete shall be cured in accordance with Section 303-1.10 of the Standard Specifications. If curing compounds are utilized, they shall be Type 2 (white pigmented), in accordance with Section 201-4.1 of the Standard Specifications applied at a rate recommended by the manufacturer. In any event, said rate shall not be less than one (1) gallon per 150 square feet. If plastic sheets are utilized, they shall be white polyethylene sheets. Sheets shall be well-lapped at the joint and joints, ends, and edges shall be securely fastened to prevent sheets from blowing away.