

SECTION 32 0523
CEMENT AND CONCRETE FOR EXTERIOR IMPROVEMENTS
Addendum #1

PART 1 – GENERAL

- 1.1 RELATED DOCUMENTS
 - A. Drawings, Division 1 Specification Sections, and Agreements apply to this section.
 - B. See civil drawings and soils report for additional specifications.
- 1.2 SUMMARY
 - A. Extent of Portland cement concrete paving is shown on drawings, including curbs, gutters, walkways not part of landscape work, and pavement at Loading Area.
 - B. Prepared subbase is specified in "Earth Moving" section.
- 1.3 SUBMITTALS
 - A. Provide samples, manufacturer's product data, test reports, and materials' certifications as required in referenced sections for concrete and joint fillers and sealers.
- 1.4 QUALITY ASSURANCE
 - A. Standards:
 - 1. City of Simi Valley Standards, and Specifications.
 - 2. "Greenbook" - Standard Specifications for Public Works Construction, latest edition.
 - B. Codes:
 - 1. California Building Code, 2016
- 1.5 JOB CONDITIONS
 - A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

PART 2-PRODUCTS

- 2.1 MATERIALS
 - A. Forms: Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects.
 - 1. Use flexible spring steel forms or laminated boards to form radius bends as required.
 - B. Coat forms with a nonstaining form release agent that will not discolor or deface surface of concrete.
 - C. Welded Wire Mesh: Welded plain cold-drawn steel wire fabric, ASTM A 185.
 - D. Reinforcing Bars: Deformed steel bars, ASTM A 615, Grade 60.
 - E. Fabricated Bar Mats: Welded or clip-assembled steel bar or rod mats, ASTM A 184. Use ASTM A 615, Grade 60 steel bars, unless otherwise indicated.
 - F. Joint Dowel Bars: Plain steel bars, ASTM A 615, Grade 60. Cut bars true to length with ends square and free of burrs.
 - G. Hook Bolts: ASTM A 307, Grade A bolts, internally and externally threaded. Design hook bolt joint assembly to hold coupling against pavement form and in position during concrete operations, and to permit removal without damage to concrete or hook bolt.
 - H. Concrete Materials: Unless otherwise specified on the Civil Drawings, concrete shall be 520-C-2500. Admixtures, bonding materials, curing materials, or other concrete additives shall be approved by the Engineer prior to use.
 - 1. Expansion Joint Materials: Concrete Tie "Fiber Expansion Joint" or approved alternate, conforming to AASHTO M-213, and ASTM D1751. Concrete Tie "Rubber Calk #280" or approved alternate, conforming to ASTM C920-79.
 - J. Antispalling Compound: Combination of boiled linseed oil and mineral spirits, complying with AASHTO M-233.
- 2.2 CONCRETE MIX, DESIGN, AND TESTING

- A. Concrete mix design shall conform to the recommendations of the Geotechnical Engineer, as well as the Standard Specifications for Public Works construction. Portland cement concrete shall be sampled and tested in accordance with the ASTM and California tests.
- B. Design mix to produce normal-weight concrete consisting of portland cement, aggregate, water-reducing or high-range water-reducing admixture (superplasticizer), air-entraining admixture, and water to produce the following properties:
 - 1. Compressive Strength: See Section 201-1.1.2, Standard Specification for Public Works Construction, latest Edition.
 - 2. Slump Limits: See Section 201-1.1.2, Standard Specification for Public Works Construction, latest Edition.

PART 3 – EXECUTION

3.1 SURFACE PREPARATION

- A. Remove loose material from compacted subbase surface immediately before placing concrete.
- B. Proof-roll prepared subbase surface to check for unstable areas and need for additional compaction. Do not begin paving work until such conditions have been corrected and are ready to receive paving.

3.2 FORM CONSTRUCTION

- A. Set forms to required grades and fines, braced and secured. Install forms to allow continuous progress of work and so that forms can remain in place at least 24 hours after concrete placement.
- B. Check completed formwork for grade and alignment to following tolerances:
 - 1. Top of forms not more than 1/8 inch in 10 feet.
 - 2. Vertical face on longitudinal axis, not more than 1/4 inch in 10 feet.
- C. Clean forms after each use and coat with form release agent as required to ensure separation from concrete without damage.

3.3 REINFORCEMENT

- A. Locate, place and support reinforcement as indicated on the Civil Drawings, Structural Drawings and/or Architectural Drawings.

3.4 CONCRETE PLACEMENT

- A. General: See Standard Specification for Public Works Construction, Section 201-1.4, latest Edition for mixing and placing concrete, and as herein specified.
- B. Do not place concrete until subbase and forms have been checked for line and grade. Moisten subbase if required to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.
- C. Place concrete by methods that prevent segregation of mix. Consolidate concrete along face of forms and adjacent to transverse joints with internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand-spreading and consolidation. Consolidate with care to prevent dislocation of reinforcing, dowels, and joint devices.
- D. Use bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- E. Deposit and spread concrete in a continuous operation between transverse joints as far as possible. If interrupted for more than 1/2 hour, place a construction joint.
- F. When adjacent pavement lanes are placed in separate pours, do not operate equipment on concrete until pavement has attained sufficient strength to carry loads without injury.
- G. Fabricated Bar Mats: Keep mats clean and free from excessive rust, and handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities or replace units as required before placement. Set mats for a minimum 2-inch overlap to adjacent mats.
 - 1. Place concrete in 2 operations; strike off initial pour for entire width of placement and to the required depth below finish surface. Lay fabricated bar mats

2. immediately in final position. Place top layer of concrete, strike off, and screed.
2. Remove and replace portions of bottom layer of concrete that have been placed more than 15 minutes without being covered by top layer or use bonding agent if acceptable to the governing agency inspector.
- H. Curbs and Gutters: Automatic machine may be used for curb and gutter placement at Contractor's option. If machine placement is to be used, submit revised mix design and laboratory test results that meet or exceed minimums specified. Machine placement must produce curbs and gutters to required cross-section, lines, grades, finish, and jointing as specified for formed concrete. If results are not acceptable, remove and replace with formed concrete as specified

3.5 JOINTS

- A. General: Construct expansion, weakened-plane (contraction), and construction joints true to line with face perpendicular to surface of concrete. Construct transverse joints at right angles to the centerline, unless otherwise indicated.
- B. When joining existing structures, place transverse joints to align with previously placed joints, unless otherwise indicated.
- C. Construction Joints: Place construction joints at end of placements and at locations where placement operations are stopped for more than 1/2 hour, except where such placements terminate at expansion joints.
 1. Construct joints as shown or, if not shown, use standard metal keyway-section forms.
 2. Where load transfer-slip dowel devices are used, install so that one end of each dowel bar is free to move.
- D. Expansion Joints: Provide premolded joint filler for expansion joints abutting concrete curbs, catch basins, manholes, inlets, structures, walks, and other fixed objects, unless otherwise indicated.
 1. Locate expansion joints at 50 feet o/c. for each pavement lane unless otherwise indicated on plans or specified in Soils Report.
- E. Extend joint fillers full width and depth of joint, not less than 1/2 inch or more than 1 inch below finished surface where joint sealer is indicated. If no joint sealer, place top of joint filler flush with finished concrete surface.
- F. Furnish joint fillers in one-piece lengths for full width being placed wherever possible. Where more than one length is required, lace or clip joint filler sections together.
- G. Protect top edge of joint filler during concrete placement with a metal cap or other temporary material. Remove protection after concrete has been placed on both sides of joint.
- H. Fillers and Sealants: See Standard Specification for Public Works Construction, Section 201-3, latest Edition for preparation of joints, materials, installation, and performance.

3.6 CONCRETE FINISHING

- A. After striking-off and consolidating concrete, smooth surface by screeding and floating. Use hand methods only where mechanical floating is not possible. Adjust floating to compact surface and produce uniform texture.
- B. After floating, test surface for trueness with a 10-ft, straightedge. Distribute concrete as required to remove surface irregularities, and refloat repaired areas to provide a continuous smooth finish.
- C. Work edges of slabs, gutters, back top edge of curb, and formed joints with an edging tool, and round to 1/2-inch radius, unless otherwise indicated. Eliminate tool marks on concrete surface.
- D. After completion of floating and when excess moisture or surface sheen has disappeared, complete troweling and finish surface as follows:
 1. Broom finish by drawing a fine-hair broom across concrete surface perpendicular to line of traffic. Repeat operation if required to provide a fine line texture acceptable to the Design/Builder.
 - a. On inclined slab surfaces, provide a coarse, non-slip finish by scoring surface with a stiff bristled broom, perpendicular to line of traffic.

- E. Do not remove forms for 24 hours after concrete has been placed. After form removal, clean ends of joints and point-up any minor honeycombed areas. Remove and replace areas or sections with major defects, as directed by the Architect
 - F. Exposed Aggregate Finish
 1. Place, screed, compact and float concrete as specified for all other slabs, using the gap-graded mix.
 2. Apply the retarder in compliance with its manufacturers printed instructions before initial set takes place. Cover with wet curing burlap and cure for not less than 8 nor more than 18 hours; test surface with knife to determine when to commence revealing aggregates.
 3. Test a sample panel, and after the concrete has set sufficiently use clean water and a stiff broom to remove the retarded cement paste, washing thoroughly until the aggregates are uniformly exposed approximately 1/8 inch deep and the finish matches the approved sample panel by the Architect.
 4. Replace burlap, or apply curing compound to complete the curing cycle.
- 3.7 CURING
- A. Protect and cure finished concrete paving in compliance with applicable requirements of Division 3 sections. Use membrane-forming curing and sealing compound or approved moist-curing methods.
 - B. Antispalling Treatment: Apply treatment to concrete surfaces no sooner than 28 days after placement, to clean, dry concrete free of oil, dirt, and other foreign material. Apply curing and sealing compound at a maximum coverage rate of 300 s.f. per gallon. Apply antispalling compound in 2 sprayed applications. First application at rate of 40 sq. yds. per gal.; second application, 60 sq. yds. per gallon. Allow complete drying between applications.
- 3.8 REPAIRS AND PROTECTIONS
- A. Repair or replace broken or defective concrete, as directed by the Architect.
 - B. Drill test cores where directed by the Architect when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with portland cement concrete bonded to pavement with epoxy adhesive.
 - C. Protect concrete from damage until acceptance of work. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.
 - D. Sweep concrete pavement and wash free of stains, discolorations, dirt, and other foreign material just before final inspection.

END OF SECTION