

SECTION 32 13 13
CONCRETE PAVING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Forming, jointing, placing and curing of concrete pavements, curbs, gutters, cross pans, traffic islands and sidewalks.

1.02 RELATED SECTIONS

- A. Geotechnical report.
- B. Section 31 23 00, Excavation and Fill.

1.03 REFERENCES

- A. City and County of Denver Construction Standards.
- B. CABO/ANSI A117.1 for accessibility requirements related to walks, ramps, parking areas, drives, curb ramps, etc.
- C. ACI 214 - Recommended Practice for Evaluating Compression Test Results of Field Concrete.
- D. ACI 304 - Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete.
- E. ACI 305/305R - Hot Weather Concreting.
- F. ACI 306/306R - Cold Weather Concreting.
- G. ACI 308 - Standard Practice for Curing Concrete.
- H. ASTM A82 - Cold Drawn Steel Wire for Concrete Reinforcement.
- I. ASTM A497 - Welded Deformed Steel Wire Fabric for Concrete Reinforcement.
- J. ASTM A615 - Deformed and Plain Billet-Steel for Concrete Reinforcement.
- K. ASTM C31 - Making and Curing Concrete Test Specimens in the Field.
- L. ASTM C33 - Concrete Aggregates.
- M. ASTM C39 - Test Method for Compressive Strength of Cylindrical Concrete Specimens.
- N. ASTM C94 - Ready Mix Concrete.
- O. ASTM C143 - Test Method of Slump of Hydraulic Cement Concrete.
- P. ASTM C150 - Portland Cement.
- Q. ASTM C260 - Air-Entraining Admixtures for Concrete.
- R. ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete.
- S. ASTM C494 - Chemical Admixtures for Concrete.
- T. ASTM C618 - Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete.
- U. ASTM D994 - Preformed Expansion Joint Filler for Concrete (Bituminous Type).
- V. ASTM D1190 - Concrete Joint Sealer, Hot-Poured Elastic Type.
- W. ASTM D1751 - Preformed Expansion Joint Fillers for concrete Paving and Structural Construction.
- X. ASTM D1752 - Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.

1.04 SUBMITTALS

- A. Provide under provisions of Division One Specifications.

1.05 QUALITY ASSURANCE

- A. Perform work in accordance with ACI 301, Conform materials and installation to applicable portions of City of Denver, Colorado Department of Transportation, Colorado Department of Highways, and the construction specifications, standards and details.

1.06 REGULATORY REQUIREMENTS

- A. For work on public streets or rights-of-way conform to the requirements of City of Denver construction specifications, standards and details for the construction of curbs, gutters, sidewalks, driveways, street paving, and other public right-of-way improvements.
- B. Comply with applicable requirements of CABO/ANSI A117.1 for accessibility requirements related to walks, ramps, parking areas, drives, curb ramps, etc.
- C. Obtain cementitious materials and aggregate from same source for all work.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle materials under provisions of Division One Specifications.
- B. Reinforcing steel: Store on supports which will keep materials from contact with the ground and cover.
- C. Rubber and plastic materials: Store in a cool place, do not expose to direct sunlight.
- D. Prepare a delivery ticket for each load of ready-mixed concrete.
- E. Contractor shall submit tickets for all concrete delivered to site:
 - 1. Quantity delivered.
 - 2. Actual quantity of each material in batch.
 - 3. Outdoor temp in the shade.
 - 4. Time at which cement was added.
 - 5. Numerical sequence of the delivery.
 - 6. Quantity of water that can be added in the field based on mix design.
 - 7. Free moisture in fine and coarse aggregate in percent by weight.
 - 8. Temperature of batch.

1.08 ENVIRONMENTAL REQUIREMENTS

- A. Do not place concrete when base surface temperature is less than 40 degrees F, or surface is wet or frozen.
- B. Protect concrete from rapid loss of moisture during hot water placement.

PART 2 PRODUCTS

2.01 CONCRETE MIX (EXTERIOR FLATWORK, WALKS AND PAVING)

- A. Cement type, ASTM C150.
- B. Concrete strength: 4,500 psi minimum compressive strength at 28 days per ASTM C39.
- C. Water-Cement Ratio: 0.40 max.
- D. Flyash: is not allowed.
- E. Maximum course aggregate size: 1 inch.
- F. Water: Potable. Water/cement ratio shall not exceed 0.42 (water to total weight of cementitious materials).
- G. Air entraining admixture: 5% - 8%.
- H. Water reducing admixture: Specify brand or generic description and ounces per unit of cement.
- I. Slump: 4" (maximum) without superplasticizer, 9" (maximum) with superplasticizer. These parameters do not apply to self-consolidating concrete.
- J. Specify mix approved by City and County of Denver for work in public right-of-way.

2.02 ACCEPTABLE CONCRETE PRODUCTS

- A. Lithocrete®
- B. Bomanite®
- C. Grasscrete
- D. Other with owner approval.

PART 3 EXECUTION

3.01 GENERAL

- A. Reference Division 3 sections for other concrete requirements.
- B. The start of paving work implies acceptance of sub-grade with test results for verification. Refer to Section 31 23 00, Excavation and Fill.
- C. Curing and sealing compound:
 - 1. Apply curing and sealing compound uniformly to new exterior flatwork, concrete slabs and walks, where the concrete is exposed to view and wear in the finished construction.
 - 2. Sandblasted flatwork requires an epoxy resin applied to prevent silting.
 - 3. Refer to Section 03 35 00, Concrete Finishing.
- D. Tolerances:
 - 1. Vertical tolerance of 0.1 feet for walks, drives and curb work.
 - 2. Vertical tolerance of 0.05 feet for ADA ramps and flatwork adjacent to building entrances.
 - 3. Minimum 1.5% slope on all concrete surfaces to drain.
 - 4. Sloped concrete surfaces shall not pond water (regardless of other tolerances specified).
- E. Protection: The Contractor shall be responsible for protecting newly-placed concrete from damage due to traffic and vandalism.

3.02 STRIPING AND PAINTING

- A. Refer to section 32 17 23, Pavement Markings.

3.03 FIELD QUALITY CONTROL

- A. Refer to Sections 31 23 00, Excavation and Fill for subgrade testing and quality control.

END OF SECTION 32 13 13