DIVISION 03 - CONCRETE

Exposed concrete finishes shall be sealed (See Division 7).

For exposed architectural concrete where appearance is important, require formwork design submittal and mock-ups. Set clear tolerances for finish surfaces acceptance.

EXPOSED AGGREGATE SIDEWALKS AND FLATWORK

General Requirements

Application of the following exposed aggregate concrete specification is primarily intended to be used in conjunction with new building construction or extensive hardscape developments where an accepted uniform concrete finish and overall appearance for exterior concrete hardscape is desired. This specification, therefore, applies to the new sidewalks, pathways, courtyards and plaza areas of and surrounding new campus buildings. Additionally, when existing campus facilities are undergoing renovation and replacement of sidewalks, pathways, courtyards and similar areas, evaluation of utilizing this specification is required. When the scope of the work is limited to relatively small areas, the guidelines specified in SECTION 01732 - CUTTING, PATCHING AND MATCHING shall take precedence.

Scope of Work

Exterior concrete sidewalks, pathways, courtyards and plazas shall conform to the following design criteria:

1. Shall be designed consisting of concrete panels with 12-inch wide smooth banded perimeter sections surrounding interior sections or exposed aggregate.
2. Width, length and spacing of individual concrete panel sections to be a function of the surrounding physical requirements and constraints and shall attempt to incorporate the desired architectural theme of the campus improvement.
3. Sidewalks and pedestrian pathways shall have a cross-sectional thickness conforming to the following:

<table>
<thead>
<tr>
<th>Width of Walkway</th>
<th>Thickness of Concrete Slab</th>
<th>Reinforcing Steel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 6-feet wide</td>
<td>Slab thickness = 4 inches thick</td>
<td>#4 rebar surrounding each panel w/6&quot; x 6&quot; - 10G x 10G welded wire mesh throughout panel</td>
</tr>
<tr>
<td>Less than 6-feet wide</td>
<td>Slab thickness = 6 inches thick</td>
<td>None</td>
</tr>
<tr>
<td>Greater or equal to 6-feet wide, less than or equal to 8-feet wide</td>
<td>Slab thickness = 6 inches thick</td>
<td>#4 rebar surrounding each panel w/6&quot; x 6&quot; - 10G x 10G welded wire mesh throughout panel</td>
</tr>
<tr>
<td>Greater than or equal to 8-feet wide</td>
<td>Slab thickness = 6 inches thick</td>
<td>#4 rebar surrounding each panel w/6&quot; x 6&quot; - 10G x 10G welded wire mesh throughout panel</td>
</tr>
</tbody>
</table>
4. Crack and slab expansion control shall be per the following:
   a. Where new concrete joins existing concrete, #4 x 7-inch long smooth dowels shall be
      installed at maximum 24-inch centers with one end left loose or in a smooth outer
      sleeve or jacket to allow for expansion and/or contraction. Where applicable, 1/2"
      thick felt shall be placed in-between the joint where new and existing concrete slabs
      come together.
   b. Expansion joints shall be incorporated at 40-foot maximum intervals with dowels and
      asphalt impregnated felt spacers placed as specified in (a) above.
   c. Weakened Plane Joint: Crack control shall be incorporated into the concrete cross
      section through inclusion of a deep rake joint spaced not greater than 10-feet in-
      between each weakened plane joint with 1/4" radius edges and 1" to 1-1/4" deep
      score.
   d. Design Finish Delineating Joint: Separation between the smooth surface finishes and
      the exposed aggregate surface finishes of the concrete slab shall be incorporated
      using a shallow rake joint with 1/4" radius edges.

Materials
1. Portland cement shall conform to the provisions of Section 90 of the Standard
   Specifications and pavement shall be constructed of Class A, 6-sack concrete as defined
   by Cal Trans Standard Specifications. Concrete shall be provided at point of final
   discharge with a 4-inch slump per ASTM C143.
2. Aggregate shall be clean and free of foreign material and will conform to the provisions
   of Section 90-2.02 of the Standard Specifications.
3. Exposed Aggregate Paving Mix Design
   a. Design mix: Six (6) sack Portland Cement mix, Type II/V, (564 lbs cement, 2.87
      cubic feet, +/- 5% by volume).
   b. Course aggregate: Cache Creek 3/8" x #8 pea gravel, (1,650 lbs, 9.94 cubic feet, +/-
      5% by volume).
   c. Fine aggregates: Cache Creek concrete sand (1,482 lbs sand, 9.99 cubic feet, +/-
      5% by volume).
   d. Water: (308 lbs, 4.94 cubic feet, +/- 5% by volume).
   e. Stone color: Red, black, brown and a minor amount of white evenly distributed.
      NOTE: Contractor to coordinate with the University's Representative regarding mix
      and finish. This may require, at the discretion of the University's Representative that
      a sample panel be provided by the Contractor for evaluation and approval by the
      University.
   f. Reference mix design: Mix Number X8W6041A (Teichert Cache Creek Plant), or
      equal. NOTE: A reference site to serve as a control sample for finished appearance of
      this mix design is present in sidewalks located on the south and west sides of Hunt
      Hall on the UC Davis Campus.
4. Water shall conform to the provisions of Section 90-2.03 of the Standard Specifications.
5. Aggregate base, if used, shall conform to the provisions of Section 26-1.02A of the
   Standard Specifications.
6. Expansion joint material shall be 1/2" thick, asphalt impregnated pre-molded fiber conforming to the latest revision standard specification for Preformed Expansion Joint Filler for Concrete, ASTM D1752.
7. Curing compound shall be non-pigmented curing compound conforming to the requirements of ASTM Designation C309, Type I, Class B.
8. Reinforcement bars: ASTM A615, Grade 40.
9. Wire ties to reinforcement: ASTM A82.

Inspection
1. Verify sub-base grades and compaction before starting concrete placement operations.
2. Thoroughly clean all surfaces, which will be in contact with new cement surfaces.
3. Verify control joints in sidewalk stabs are constructed at 1-foot maximum intervals unless otherwise indicated or permitted by the specified standards.
4. Verify that all reinforcement bars have been placed such that a minimum of 1-1/2" of concrete cover exists over the bars and that all dowels are in place and spaced according to the specifications.

Finishing
Use concrete retardant over exposed aggregate areas. Shield broom finished areas from retardant. Apply retardant per manufacturer's specifications. No direct exposure is allowed until broom finish is set.

Protection
Protect concrete surfaces from traffic during and following all operations until the concrete is thoroughly set and cured and does not pickup under foot or wheeled traffic.

Refer to Drawings section of Campus Standards & Design Guide for typical sidewalk detail.