



**Public Works  
Engineering Division**

**DESCRIPTION**

Construction between the lip of the gutter and the front property line under City permit and inspection shall be in conformity with these specifications, provided that approved building plans, established good engineering practice, or special instructions given at the job site by the Engineering Inspector shall prevail when a conflict with these specifications is determined.

Work not done according to these specifications, or work which undergoes failure at any time up to six months following installation when, in the judgment of the Director of Public Works, said failure is the result of non-compliance with these specifications, shall be replaced by the permittee, or by the City at the permittee's expense.

**Engineering**

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# CURBS, GUTTERS, SIDEWALKS AND DRIVEWAY APPROACHES

## Constructed Under City Permits

### CONCRETE DETAIL SPECIFICATIONS

#### MATERIALS

- I. **Portland Cement Concrete.** Hereinafter referred to as concrete, shall be five (5) sack, 1" maximum, aggregate and shall conform in all other particulars to City of Berkeley Standard Details, the current edition of Standard Specifications of the State of California of Transportation (hereinafter referred to as State Specifications), or the current edition of the "Greenbook Standard Specifications for Public Works Construction." Engineering Inspectors may reject concrete when concrete temperature is greater than 90 degrees Fahrenheit, when more than 90 minutes has elapsed after hydration, or when slump exceeds (4) inches. Contractor shall retain batch plant delivery tickets for Inspector verification.
- II. **Paving Brick and Paving Tile** (pavers) shall have a surface with a coefficient of friction equal to or greater than broom finished concrete in both wet and dry conditions; the surface relief shall be minimal and joints between units shall be tight to minimize vibration transferred to wheelchair users. A sample of the paver must be submitted to and approved by the Public Works Department prior to the start of construction.
- III. **Cement Mortar** shall consist of three (3) parts washed masonry sand, free of organic material, mixed with one (1) part of Portland cement. About ¼ part of lime or fire clay may be added if desired.
- IV. **Reinforcing Steel** shall be ½" diameter ( #4) deformed bars unless an alternate is specifically approved by the Engineering Inspector or specified in a City of Berkeley standard detail or approved plans. Reinforcing steel shall conform to appropriate ASTM standards.
- V. **Concrete Additives** other than 1½ pints of lampblack per cubic yard (required in concrete for standard finish sidewalks, widened sidewalks and driveways) must be approved in advance by the Engineering Inspector. All additives, other than color additives, must be added at the batch plant. Rapid curing agents, such as NaCl or CaCl may not exceed 1% in any case and are strictly prohibited from concrete with reinforcing steel.
- VI. **Prohibited Material.** The installation of any material other than standard finished concrete or soil in the area between the front property line and the curb is prohibited unless specifically authorized by the Director of Public Works or his representative.
- VII. **Untreated Base** shall be free of deleterious material, and meet the grading and quality requirements found in Section 26 of the current State Specifications for Class 2 aggregate base. Other suitable material may be used if approved by the Engineering Inspector.
- VIII. **Curing Compound** shall conform to ASTM C309, and when used, shall be sprayed on the concrete within one hour after finishing at the rate of one (1) gallon per two hundred (200) square feet.

**CONCRETE DESIGN SPECIFICATIONS**

- I. Sidewalks** shall have a minimum thickness of 3½" of concrete or other approved paving material. Sidewalk widths shall be those designated in the Surface Maps of the Department of Public Works, or as directed by the Engineering Inspector at the job site. Cross-slopes shall not exceed 2% in the accessible path of travel unless specifically approved by the Engineering Inspector. Running slopes shall not exceed 5% in the accessible path of travel unless specifically approved by the Engineering Inspector.
- II. Widened Sidewalk** must be authorized by the Director of Public Works or his/her representative before installation is allowed. Paving of the planter strip between the curb and the front of the sidewalk line is unlawful unless written permission is secured from the Parks, Recreation, and Waterfront Department. The installation of one or more tree wells may be required by the city of Berkeley Forestry Supervisor if widening is approved. The Forester shall be contacted for approval of plans prior to the start of construction so that the number, location, and size of the tree wells can be determined.
- III. Driveways.** All driveway approaches shall be 6" minimum thickness of concrete. Reinforcing steel can only be installed in commercial driveways. Driveway geometry shall conform to the "Parking, Loading, Driveway and Access Standards" found in Chapter 23 of the City of Berkeley Zoning Ordinances, and shall be constructed to Standard Detail 8151. The driveway apron shall be constructed in such a way that a minimum 6" water barrier is maintained between the gutter flowline and the front sidewalk line (or within 4 feet of the gutter flow line where no sidewalk exists).
- IV. Curb and combined Curb and Gutter** shall be constructed in accordance with City of Berkeley Detail 8145. Where adjacent curb or curb and gutter is non-standard, or where authorized by the Engineering Inspector, an alternative design may be allowed provided permission is sought and obtained prior to the start of construction.
- V. Concrete Finish.** Sidewalks and driveways shall be finished using a wood float followed by a medium soft broom stroke in a direction perpendicular to the curb. Where the existing adjacent sidewalk finish is still sufficiently visible to determine the method used, every effort should be made to match it as closely as possible except that steel trowel or slick finish concrete is strictly prohibited in any case. Curb and/or gutter shall be steel troweled and lightly brushed to remove the trowel marks. Any finish other than these standard concrete finishes must be approved by the Engineering Inspector prior to the start of work.
- VI. Control Joints** or weakened plane joints approximately 1/5 the thickness of the concrete in depth and ¼" maximum width shall be placed using standard commercially available tools or control joint filler material as directed by the Engineering Inspector and in conformity with the following standards: transversely (perpendicular to the curb) about every 10 - 12 feet in all sidewalks, between the sidewalk and edge of driveway where the thickness changes, at tree well corners, at beginning and end of curb returns and at projecting corners of existing sidewalk or other structures where contraction cracks are likely to occur. Longitudinal (parallel to curb) control joints shall be installed in driveways in alignment with front and back edges of sidewalk. In sidewalks, widened sidewalks and driveways longitudinal control joints shall be installed to align with the back of curb, when curb and flat work are poured monolithically (together) and along back of sidewalk at entry walks. On long continuous sidewalk pours or in known earth movement areas, control joint filler material may be required by the Engineering Inspector in addition to the regular control joints. Wherever possible, control joints shall be placed to coincide or align with score marks.
- VII. Score Lines** shall conform to the same pattern established in the existing adjoining sidewalk or driveway. Where there are conflicting score patterns on the block, or where the entire frontage is being replaced, the Engineering Inspector may approve an alternate score pattern.
- VIII. Paving Brick** or paving tile (pavers) if allowed shall be embedded in ½" thick minimum mortar over a minimum 3" thick concrete base when installed in the sidewalk (6" concrete base in driveways). The mortar joints between bricks shall be finished flush or only slightly depressed below the pavers' surface. In residential areas, or low pedestrian use areas, alternate installation methods using permeable surfaces may be approved by the Engineering Inspector and/or Forester for paver installation in the parking strip or behind the sidewalk.

## CONSTRUCTION METHODS

- I. **Subgrades** shall be firm to displacement and of an even grade. Soft spots shall be removed and backfilled with aggregate baserock as directed by the Engineering Inspector. Subgrade shall be scarified and moisture-conditioned prior to compacting and placing aggregate baserock.
- II. **Base Construction** shall consist of 2" minimum thickness of Untreated Base (see Materials). The base shall be moisture-conditioned and placed to an even grade with no pockets or irregularities prior to compaction and concrete placement.
- III. **Existing Concrete** curbs, gutters, sidewalks and driveways shall be saw cut along the nearest score line adjacent to the area being replaced. The existing flat work shall be under cut 2" minimum vertically and horizontally to provide a "key" to decrease the possibility of future sidewalk lifting. If adjacent concrete is in good condition, contractor may choose to install dowels as described in Standard Detail #8144.
- IV. **Forms** shall be set at the correct line and grade in compliance with the Design Specifications above and in accordance with good Engineering practice. Contractor is responsible for achieving proper line and grade. Concrete shall not be placed until forms have been inspected and approved by the Engineering Inspector, or when atmospheric temperature is less than 36° F, or when rainfall is imminent. The permittee is advised to have on hand plastic sheeting, ready to cover concrete surface, when working in threatening weather.
- V. **Finishing Methods.** For sidewalk or driveway construction, immediately after the concrete is placed and screened, concrete shall be bull floated or wood floated, edged and control jointed. When concrete has set long enough to evaporate all bleed water from the surface, the second floating may commence (the sprinkling of dry cement to absorb excess surface water is prohibited). The second floating should be done with a wood or metal alloy float. After completion of the floating operations, the score lines should be installed, using a straight board and/or snapped line as a guide, the edges and control joints re-done if necessary followed by the final medium broom surface finish.

As soon as concrete has gained sufficient rigidity to remain in place without slumping (24 hours after placement, depending on weather), the front curb form shall be removed and the curb face control jointed, steel troweled and brushed.

Any special finishes, such as colored concrete, patterned broom, sandblasting etc., shall be finished according to standard construction methods, which shall be discussed with and approved by the Engineering Inspector prior to the placing of concrete.

Curing compound should be sprayed on sidewalks and driveways when the outside temperature exceeds 70° , or if other atmospheric conditions make such treatment advisable.

- VI. **Form Removal, Street Conform, Clean Up.** Forms, other than curb face forms, shall be removed no sooner than 12 hours after finishing has been completed. Voids or excavations adjacent to new concrete created by the installation and removal of forms shall be filled to the proper grade as directed by the Engineering Inspector. Street paving that was removed to facilitate the construction of a curb, gutter or driveway shall be replaced by repaving the open area with asphalt concrete in accordance with standard City of Berkeley Standard Detail 8148 or as directed by the Engineering Inspector. Any defaced concrete shall be repaired within 24 hours of the final finishing operation by rubbing with a stone and water and re-brushing or other accepted industry standards. If, in the inspector's opinion, the defacement is too severe to be repaired, the concrete shall be saw cut along the nearest score line and removed and replaced with new concrete. All tools, barricades, debris, forms, etc., shall be removed from the site as soon as it is safe to do so.
- VII. **Protection of Work.** The installer shall protect his work in accordance with good engineering practice. Normally, new concrete should not be opened to foot traffic for 24 to 72 hours, nor to vehicular traffic within 72 hours, but in no case will concrete be opened either to pedestrian or vehicular traffic in less than 24 hours after finishing. The permittee or his installing agent is responsible for the protection of the work. The use of suitable signs, barricades and lights, and the maintenance of pedestrian and vehicular safety is required.