Chapter 4 Construction Details

Section 73 Concrete Curbs and Sidewalks

4-7301 General
4-7302 Before Work Begins
4-7303 During the Course of Work
4-7304 Level of Inspection
4-7305 Quality Control
4-7306 Payment

Chapter 4 Construction Details

Section 73 Concrete Curbs and Sidewalks

4-7301 General

This section provides guidelines for inspecting concrete curbs, sidewalks, and their appurtenances, such as gutter depressions, island paving, curb ramps, and driveways. For specifications about the construction of concrete curbs and sidewalks, refer to Section 73, "Concrete Curbs and Sidewalks," of the *Standard Specifications*.

For information on the production and transportation of concrete, refer to Section 4-90, "Concrete," of this manual.

4-7302 Before Work Begins

During this preliminary review, take the following steps:

- Review the contract for details about the project's concrete curbs and sidewalks, and compare these details with conditions in the field. As appropriate, review sheets A87A, "Curbs and Driveways"; A88A, "Curb Ramp Details"; and A88B, "Curb Ramp and Island Passageway Details," of the *Standard Plans*.
- Before constructing any curbs, gutters, or sidewalks other than those shown on the plans, review the *Highway Design Manual* to determine the policy. Note that Design Information Bulletin (DIB) 82-06, "Pedestrian Accessibility Guidelines for Highway Projects," includes Americans with Disabilities Act (ADA) design guidance on these facilities. Make sure curbs, gutters, or sidewalks:
  1. Conform to the current policy of replacing existing facilities.
  2. Comply with agreements such as Maintenance Agreements.
  3. Provide proper drainage.
- During the preconstruction conference, include a discussion on temporary and permanent pedestrian access facilities such as sidewalks and curb ramps, stressing contract compliance of such features as dimensioning and slopes, for conformance with ADA design and legal requirements. Discuss the importance for contractor quality control on construction operations for these elements during forming and concrete placement operations to assure compliance. Note that the contractor is required to check forms before placing concrete to verify that dimensioning and slope requirements will be met. Remind the contractor that failure to achieve compliance will require corrective action, or removal and replacement. Refer to Section 5-1.30, "Noncompliant and Unauthorized Work," of the *Standard Specifications*.
- Discuss the construction operation with the contractor. Review any project-specific traffic handling plans. Determine whether the contractor has considered the public's convenience as required by Section 7-1.03, "Public Convenience," of the *Standard Specifications* and applicable sections of the special provisions. For

information on public convenience, refer to Section 3-702A, “Convenience of the Public and Public Traffic,” of this manual. Advise the contractor of any necessary modifications to the operation.

- Discuss survey staking requests with the district Survey Unit, including the positional accuracy of stakes necessary to construct these facilities and any special staking needs. Make a general check of the layout as staked, including the location of gutter depressions, curb ramps, and driveways. Also review the stakes for accuracy. Verify grades will accommodate finished slope requirements. If layout and grades will not meet requirements, process a change order to correct the problem in consultation with the project engineer to assure ADA compliance.
- If the contract includes a preconstruction and post-construction survey bid item, make sure the contractor’s licensed preconstruction survey has been completed and that no conflicts in achieving design dimensioning and slope requirements have been identified. If layout or grades will not meet requirements, process a change order in consultation with the project engineer to assure ADA compliance.
- Make sure an approved gradation for the combined aggregate for minor concrete is on file in the project records. Note that any testing of minor concrete is at the resident engineer’s discretion. Normally, testing is not necessary for minor concrete produced at a plant with a good history of producing concrete for Caltrans work. For minor concrete from a source that has not been previously used on the project, require the contractor to submit a certificate of compliance.
- Examine the subgrade to confirm the following:
    1. The subgrade has been constructed to the proper elevation and cross section. As specified, require the contractor to check the subgrade with a template.
    2. The foundation has been watered and compacted. When the subgrade is constructed in a structural layer, the compaction required in such a layer usually applies. When the subgrade is original ground outside of those areas where 95 percent compaction is required, no specific compaction value is required; however, to obtain a stable foundation, a watering and compacting operation is required. Unless the contractor chooses to allow soft or spongy areas to dry before placing concrete, order their removal.
    3. The subgrade is wet immediately before placing concrete.
- Verify the contractor has implemented appropriate best management practices for washing out concrete mixer trucks.

4-7303 During the Course of Work

Once work begins, take these steps:

- Examine the forms to confirm the following:
    1. They are smooth on the side next to the concrete.

2. They have a true, smooth upper edge.
3. They are rigid enough to withstand the pressure of fresh concrete without distortion. Order the replacement of forms that will not result in an end product within specified tolerances.
4. They are coated with form oil as specified.
5. They have the specified full depth.
6. They are placed to the lines and grades shown on the control stakes. Also, verify that correction adjustments of any unsightly changes in vertical or horizontal alignment are made. Adjustment from staked grades is sometimes necessary near joints with existing curbs or sidewalks provided dimensions and slope requirements are achieved. In some limited instances, constraints may prevent strict compliance in the conforming area, for example, areas that join new curb ramp landings to existing sidewalks. In these instances, the conforming area is to meet ADA requirements to the extent practical within the scope of the project.

- Verify that gutters will drain. When new curbs are to be joined with existing facilities, check the existing elevations against the planned grades.
- Make sure that curb and sidewalk construction conforms to any construction staging specified in the contract.
- Finished appearance is important and is noticeable by the public. Existing edges of pavement and sidewalks or existing pavement surfaces should not be used directly to establish a grade line for curbs.
- Check that all dowels and reinforcements are in place.
- In fixed-form construction, the contractor may choose to use anchor bolts instead of dowels. When the bolts are equivalent to the dowels, approve the use of the bolts.
- Verify that joints are sawed as specified.
- For extruded-form construction, the contractor may choose to use an adhesive instead of dowels. When this option is chosen, make sure the contractor cleans the pavement as specified and uses the required adhesive. Inspect the slipform machine to make sure it meets specifications.
- Make sure the contractor does not place concrete on frozen or ice-coated material.
- Inspect the placement of weakened plane and expansion joints to verify that they are constructed as specified.
- During the placement of minor concrete, check temperatures, mixing time, elapsed time, number of revolutions, and penetration. Verify that weighmaster certificates, with the required information, are delivered with each load of minor concrete.

- Observe concrete as it is placed. In the daily report, record the reasons for rejecting any concrete and the approximate amount rejected. Make sure the contractor does not allow concrete to segregate while being placed and consolidated in the forms. Stop operations if the concrete requires patching with grout or mortar. Insist the contractor correct their placing operation.
- Before the forms are removed, make sure the contractor uses the required 10-foot float to finish the surface.
- Note whether the forms are being removed within the specified time limits. When corrective measures are necessary, advise the contractor, and note such advice in the daily report.
- Verify that the curing complies with one of the specified methods.
- Check that the contractor protects the concrete after placement according to the specifications.
- Verify that detectable warning surfaces are on the Authorized Materials List and comply with required color. Make sure that prefabricated detectable warning surfaces are installed according to manufacturer recommendations and obtain the 5-year manufacturer warranty of replacement for defects.
- Verify that the finishing meets specifications and measure the finished product to verify that it conforms to contract requirements for slopes and dimensions.
- Verify that the contractor complies with temporary pedestrian facility requirements under Sections 7-1.02A, “General”; 7-1.04, “Public Safety”; 12-4.04, “Temporary Pedestrian Access Routes”; and 16-2.02 “Temporary Pedestrian Facilities,” of the *Standard Specifications*. Also, refer to Sections 2-216D, “Temporary Facilities,” and 4-12, “Temporary Traffic Control,” of this manual for additional guidance.
- For slope checks of pedestrian facilities, use smart levels with a minimum sensor accuracy of 0.1 degree for measuring slopes parallel and perpendicular to the pedestrian travelled way. Make sure that the smart level is calibrated in accordance with the manufacturer’s recommendations before taking measurements. A 4-foot smart level should be used on dimensions greater than 4 feet. Use a 2-foot smart level at other locations. Make sure the measured surface is free of grit and other substances before placing the smart level. For each slope check, take three readings equally dispersed across the surface to be measured. Do not average the readings. Record all slope measurements to the nearest 0.1 percent. Because of smart level accuracies, measured slopes may exceed maximum slopes by 0.2 percent for acceptance. Note that for parallel travelled way slope checks on curved ramps, smart levels should not be used for determining compliance; alternative means must be employed.
- For dimensional checks of pedestrian facilities, use a standard measuring tape. For each dimensional check, take three readings equally dispersed across the surface to be measured. Do not average the readings. Record reading to the

nearest 1/8 inch. Because of measuring tape accuracies, measured dimensions may be less than minimum dimensions by 1/4 inch for acceptance.

- Record slope and dimensional checks of a pedestrian facility on an applicable compliance inspection report. Refer to Section 5-101, “Forms Used for Contract Administration,” of this manual for a listing of compliance inspection reports. File completed compliance inspection reports in Category 57, “Permanent Pedestrian Facilities,” of the project records.
- Record latitude and longitude measurements on inspection forms for each permanent pedestrian facility using a free global positioning system (GPS) application for smart phones, tablets, or computers. Record these values to a minimum of six decimal degrees for asset management use. These will be used to differentiate the asset from other assets; therefore, a high-level of accuracy is not required.
- Where the contract includes a post-construction survey requirement, verify the contractor’s licensed post-construction survey has been completed and shows dimensional and slope requirements have been achieved for the facility. Special provisions may also require that the contractor submit these measurements on the applicable facility compliance inspection report. Verify that the survey itself meets specified requirements. Spot check the contractor’s licensed post-construction survey for verification of dimensions and slopes when completing an applicable compliance inspection report. File documentation in Category 57, “Permanent Pedestrian Facilities,” of the project records.
- In the event dimensions, or slopes, or both, of the completed pedestrian facilities are noncompliant with contract requirements, contact the project engineer to determine if ADA compliance has been achieved. Any noncompliant work should be corrected or removed and replaced.
- Payment, acceptance, and certification of completed elements should only occur after verifying compliance.
- Contact the project engineer and district ADA engineer in the event any of the project’s planned pedestrian facilities are being considered for removal from the project’s scope of work. The district ADA engineer helps manage the district’s ADA transition plan and tracks delivery of pedestrian facilities.
- Before construction contract acceptance, complete Form DOT CEM-5773, “Americans with Disabilities Act (ADA) Project Compliance Certification.” Complete this form for all projects whether or not the project includes permanent pedestrian facilities. Transmit the completed ADA project compliance certification form, and for each location, the first page of the compliance inspection report, to ADA.Compliance.Office@dot.ca.gov. File the completed certification in Category 57, “Permanent Pedestrian Facilities,” of the project records.
- For detailed information concerning inspection of permanent pedestrian facilities by type, see the *Permanent Pedestrian Facilities ADA Compliance Handbook* at:

  https://dot.ca.gov/programs/construction/publications

4-7304 Level of Inspection

Suggested levels of inspection for typical concrete curbs and sidewalks work activities are:

- Benchmark inspection of layout once survey staking has been placed.
- Benchmark inspection of subgrade compaction and grades beneath the facilities to be constructed.
- Benchmark inspection of forms for line and grade before concrete placement.
- Intermittent inspection of concrete placement operations.
- Intermittent inspection of completed facilities before payment and acceptance.

4-7305 Quality Control

When the contract includes an item for preconstruction and post-construction surveys of a pedestrian facility, such as a curb ramp, verify that the contractor's surveys are submitted under seal of a properly licensed individual.

Before concrete placement, check that the contractor verifies that the finished surface of the subgrade does not project into the concrete section.

Before concrete placement for sidewalks, gutter depressions, island paving, curb ramps, and driveways, check that the contractor verifies that forms and site constraints will allow the required dimensioning and slopes shown in the contract documents.

When textured concrete or colored concrete surfaces are specified, make sure the contractor constructs test panels in accordance with Section 51-1.01D(2)(c), "Test Panels," of the *Standard Specifications*.

4-7306 Payment

Measure concrete curbs and sidewalks by the cubic yard from the dimensions shown on the plans or by longitudinal field measurement.

To determine pay quantities for curb when minor concrete is paid for by the cubic yard, you may use the table for curb quantity factors (cubic yards/foot) in the *Standard Plans*.