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### Section 29 Treated Permeable Bases

#### 4-2901 General

This section provides guidelines for inspecting treated permeable base for work specified under Section 29, “Treated Permeable Bases,” of the *Standard Specifications*. Treated permeable base is placed under concrete or hot mix asphalt pavement and provides a highly permeable drainage layer within the pavement structure. The bid item list and plans will specify the type of binder material, either asphalt or cement.

#### 4-2902 Before Work Begins

For preliminary review and inspections, do the following:

- Obtain the contractor’s quality control plan, which details the methods the contractor will use to assure quality of work and conformance with the requirements of the *Standard Specifications*.
- If mutually agreeable with the contractor, hold a meeting before construction to discuss the quality control plan and contractor’s method for performing each element of work affecting material quality, including acceptance testing priorities, shipping of samples, lines of communication for test results, timeframes for reporting quality control and acceptance test results, and any contractual testing dispute resolution processes.
- Obtain samples of aggregates to test for contract compliance. If the same source is used to produce aggregate for other Caltrans work, decide whether current test reports represent the material to be used. If so, initial sampling and testing can be waived.
- Examine the contractor’s plant and storage areas to determine contract compliance. Section 4-39, “Asphalt Concrete,” and Section 4-90, “Concrete,” of this manual provide guidelines.
- Check that the underlying subgrade meets compaction requirements and is uniformly moist and free of loose or extraneous material.
- Inspect the subgrade elevation. Areas lower than the grade established by the resident engineer must be filled with permeable base. Spot check areas at stations where stakes are set and between stations.
- Verify that filter fabric meets specifications.
- Review planned locations of cross-drain interceptors and Sheet P53 of the *Standard Plans*. Verify that the interceptors are properly located to prevent water collecting under the pavement. Refer to Section 4-68, “Subsurface Drains,” of this manual for information about underdrains.
- Verify that spreading and compacting equipment complies with the specifications.

#### **4-2903 During the Course of Work**

During the course of work, follow these inspection steps:

- Verify that the air temperature exceeds the minimum specified temperature during spreading.
- Verify that filter fabric is placed on the high side of the treated permeable blanket in accordance with the plans and specifications.
- Refer to Chapter 6-1, "Sample Types and Frequencies," of this manual for acceptance quality characteristics and associated sampling and testing frequencies.
- Follow Section 23-1.01D(1)(b), "Test Result Disputes," of the *Standard Specifications* if the contractor disputes Caltrans' acceptance results. An independent third party, selected with the contractor, performs referee testing as specified in the specifications and must have no previous direct involvement with the contract.

#### **4-2903A Asphalt-Treated Permeable Base**

- Determine which compaction method the contractor plans to use and verify that rollers used do not exceed the specified weight requirements.
- Check the temperature of the asphalt-treated permeable base to assure that compaction is performed within the specified temperature range.
- During placement of the asphalt treated permeable base over edge drains, verify that the temperature of the material falls within the limits specified in Section 68-4.03, "Construction," of the *Standard Specifications*, which covers the installation of subsurface drains. Staying below the maximum limit is critical to prevent damage to the edge drains.

#### **4-2903B Cement-Treated Permeable Base**

- Verify that the contractor meets the time and temperature requirements for mixing and transporting.
- Reject any that is segregated or not uniformly mixed.
- Observe rolling to determine that compaction meets specifications.
- Observe the consistency of cement-treated permeable base during placement. If the mix is too wet, order an adjustment to the water-cement ratio to assure that the cement paste does not plug the openings in the edge drains.
- Determine that the base is cured as specified.

#### **4-2903C Protection**

Contamination or filling voids with foreign material will destroy the base's function. The assistant resident engineer should be alert to this problem and require the contractor to take steps to make sure the base remains free of any foreign material.

Do not allow any equipment on the completed mat except what is permitted in Section 5-1.37, "Maintenance and Protection," of the *Standard Specifications*.

#### 4-2903D Surface Tolerance

For the finished surface of treated bases, the specifications provide tolerances above and below the grade established by the resident engineer. Check the finished surface as described for subgrade in Section 4-2902, "Before Work Begins," in this manual. Document the results in Form CEM-4501, "Resident Engineer's Daily Report or Assistant Resident Engineer's Daily Report," and require the specified corrections for low or high areas. For low areas, decide whether permeable base is removed and replaced or allowed to remain after correcting with specified pavement materials. Information in Chapter 650, "Pavement Drainage," of the *Highway Design Manual* may be used to determine the adequate thickness of treated permeable base layers.

#### **4-2904 Level of Inspection**

Suggested levels of inspection for typical treated permeable base work activities are:

- Benchmark inspection of subgrade grading plane.
- Intermittent sampling and testing of treated permeable base materials.
- Intermittent inspection of placement, spreading, and compaction operations.
- Intermittent review of contractor's quality control program including quality control test results.
- Benchmark inspection of finished surface grading plane.

#### **4-2905 Quality Control**

Guidance for quality control activities included in this section is summarized as follows:

- Verify that the contractor is actively performing quality control on treated permeable base materials throughout production operations by reviewing copies of quality control records, including quality control test results.
- The quality control plan must include, but is not limited to:
  - Frequency of quality control sampling and testing that meets or exceeds specification requirements as listed in Section 29-2.01D(2)(b) and 29-3.01D(2)(b), "Quality Control Testing," of the *Standard Specifications*.
  - Time and frequency of submitting test results.
  - Action and suspension limits, and details of corrective action to be taken if any process is outside of those limits. Suspension limits must not exceed specified acceptance criteria.
- Responsibilities of subcontractors and testing laboratories.

- Quality control manager if the quantity of subbase or base exceeds the requirements listed in the “QC Testing Frequencies” table of Section 25-1.01D(2)(d), “Quality Control Testing,” of the *Standard Specifications*.

#### **4-2906 Payment**

For measurement and payment, review the plans and quantity calculations in the resident engineer’s file to determine if there is sufficient detail and accuracy to be used in the project records. The payment for treated permeable base does not include quantity used for edge drains or to fill low areas of subgrade.