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Section 6 Control of Materials

3-601 General

Section 6, “Control of Materials,” of the *Standard Specifications*, describes the contractor’s responsibilities regarding materials used on the project.

The service life of a properly designed highway depends on the construction methods and quality of materials used in the highway’s construction. The resident engineer must verify that materials used in the work comply with contract specifications. This section presents general guidelines for assuring that specifications are met.

Materials Engineering and Testing Services (METS) will assign inspectors for materials that require inspection during manufacture or at the source of supply. Obtain a properly completed Form CEM-3101, “Notice of Materials to Be Used,” which lists the contractor’s sources of materials and the location at which those materials can be inspected. Review this form to verify that all expected materials are included, then forward the completed form to METS. METS will assure the proper assignment of inspectors and notify the suppliers of the required inspections. Refer to Section 6-202, “Responsibilities for Acceptance of Manufactured or Fabricated Materials and Products,” of this manual for additional information.

For a list of products inspected by METS, refer to Table 6-2.1, “Inspection of Fabricated and Manufactured Materials,” of this manual.

Not all products will be inspected by METS. METS has assigned to the resident engineer the inspection and release at the job site of products listed in Table 6-2.2, “Materials Acceptance Based on Authorized Material List,” and Table 6-2.3, “Materials Accepted by Certificate of Compliance,” of this manual.

Do not allow any material to be incorporated into the work until the required evidence or certificate of compliance has been received and until the field inspection has been completed at the job site.

3-602 Department-Furnished Materials

Section 6-1.02, “Department-Furnished Materials,” of the *Standard Specifications* describes the conditions under which the contractor receives materials. The resident engineer’s duties related to these materials include the following:

- Review the special provisions for materials to be Department-furnished. For materials manufactured specifically for the project, such as signs, check with the district unit responsible for ordering them to make sure they will be available when the contractor requests them.
- Obtain the contractor’s written request for all Department-furnished materials. Retain a copy of the request in the project file under Category 52, “Charges to Total Contract Allotment.”

- Verify that the contractor signs a receipt for the materials when they are delivered. Retain a copy of the receipt in the project file.
- If Department-furnished materials are damaged or lost, deduct a sufficient amount from the contractor's monthly estimate to cover the estimated cost of repair or replacement, pending such repair or replacement.
- Assure the return or disposal of Department-furnished material that has not been used in the work.

3-603 Local Materials

Section 6-1.03, "Local Materials," of the *Standard Specifications*, covers the requirements for the use of local materials and the resident engineer's responsibility for testing the material. This section also requires the contractor to furnish material from any source the contractor may elect; however, when mandatory local sources of certain materials are designated in the special provisions or on the plans, the contractor must furnish material from those designated mandatory sources.

If the contractor elects to obtain material from a non-mandatory local source, the contractor is responsible for making all arrangements necessary to obtain materials from that source. The contractor must furnish the resident engineer with a copy of the contractor's agreement with the property owner and provide copies of all necessary permits, licenses, and environmental clearances before removing any material. Refer to Section 3-510, "Coordination With Other Entities," of this manual and Section 5-1.20, "Coordination With Other Entities," of the *Standard Specifications* for additional information.

If Caltrans has entered into agreements with property owners in the vicinity of a project for obtaining material from an owner's property, the arrangements are made solely for the purpose of providing all bidders an equal opportunity to obtain material from that property. Provide the contractor a copy of the agreement between Caltrans and the property owner. Refer to Section 3-510 of this manual for more information.

The special provisions may require the contractor to obtain materials from a specified source. It may be necessary for the contractor to process the material as indicated in the special provisions to produce acceptable materials from this source.

If the resident engineer determines that the specified local material source can no longer be used for any reason, designate an alternative local material source for the balance of the material. Pay for the costs associated with the change in material source as extra work.

Occasionally, it becomes necessary to obtain additional embankment material from outside the local area and there is no item for "imported borrow." Under these circumstances, it is normal practice for Caltrans to locate an alternative source for this material. Consult with the district materials engineer for help locating an alternative material source.

In accordance with the State Contract Act, material sources must comply with the Surface Mining and Reclamation Act of 1975 (SMARA). Refer to Chapter 7, "Environmental Stewardship," of this manual and the Department of Conservation's

website at the link provided later in this section for further information regarding SMARA requirements.

If a change order directs the contractor to obtain material from Caltrans' chosen source, the Federal Highway Administration (FHWA) considers the source mandatory. The FHWA then requires written approval of a public interest finding before approval of the change order.

At a minimum, the public interest finding, written by the resident engineer, must include the following:

- The reason the chosen source is the most economical. If the determination is not based on economy, other reasons such as public safety or convenience must be included.
- The alternatives considered.
- The effect on the value of the material site.

All such sites are subject to compliance with SMARA. Mining operations determined to be in compliance are listed on the AB 3098 SMARA Eligible List. This list can be obtained from the Division of Construction or at the Department of Conservation's website:

<https://www.conservation.ca.gov/dmr>

The requirements listed do not apply to "local borrow," as defined in Section 19-7, "Borrow Material," of the *Standard Specifications*. Refer to Chapter 7, "Environmental Stewardship," of this manual for a list of mining operations that are or are not subject to SMARA requirements.

3-604 Buy America

Section 6-1.04 "Buy America" of the *Standard Specifications* includes Buy America provisions for crumb rubber, steel, and iron materials. Buy America provisions apply to Caltrans projects regardless of funding source, unless the special provisions indicate otherwise.

3-604A Crumb Rubber

Buy America requirements apply to crumb rubber incorporated into the work. The crumb rubber must be produced in the United States and derived from waste tires taken from vehicles owned and operated in the United States. Verify that the contractor submits a certificate of compliance with furnished crumb rubber showing compliance with Buy America requirements.

3-604B Steel and Iron Materials

Buy America requirements apply to steel and iron materials permanently incorporated into the work. This includes steel and iron components of a manufactured product regardless of the overall composition of the manufactured product. For example, Buy America applies to the steel welded wire reinforcement or steel reinforcing components of a precast reinforced concrete pipe.

The steel and iron materials must be melted and manufactured in the United States, except that foreign pig iron or processed, pelletized, and reduced iron ore may be used in the domestic production of the steel and iron materials.

Manufacturing begins with the initial melting and mixing and continues through the bending and coating stages. Coating includes all processes that protect or enhance the value of the material to which the coating is applied.

The manufacturing process for a product with steel or iron content is considered complete when the product is ready for use in items such as fencing, posts, and girders. It could also be considered complete if the material is installed as a component of a more complex product through further assembly, as is the case for a traffic signal head. The final assembly process does not need to be accomplished domestically as long as the steel or iron component is only installed and no manufacturing process is performed on the steel or iron component.

A certificate of compliance from the manufacturer, not the contractor, showing compliance with Buy America requirements must accompany products with steel or iron content. Verify receipt of the required certificates of compliance and mill test reports.

3-604B (1) Resident Engineer Approval of Minimum Use Requirements

Buy America requirements do not apply to a minimal use of steel and iron materials incorporated in the work as specified in Section 6-1.04C, "Steel and Iron Materials," of the *Standard Specifications*.

Before incorporating foreign steel and iron materials into the work, the contractor must submit documentation regarding the quantity and value of the foreign steel and iron to the resident engineer. Review the documentation to determine if it supports the minimum-use rule before allowing the material to be incorporated into the project. If the minimum-use rule applies, approve the exception in writing. This applies as a one-time total exemption for each contract and not for each purchase. File the documentation, exceptions, and a running total of the value of minimum-use foreign steel and iron under Category 41, "Report of Inspection of Material."

3-604B (2) Federal Highway Administration Approval of Waivers

Caltrans does not have the authority to allow the use of foreign steel and iron content in products subject to Buy America in federal-aid projects without FHWA approval, except under the minimum-use rule. The California FHWA division administrator may grant waivers only upon receiving concurrence from FHWA headquarters in Washington, D.C. Approval or denial may take several months.

Approval by FHWA of the waiver is required before allowing foreign steel or iron that exceeds the minimum-use rule into the project. Lack of an FHWA-approved waiver can result in the loss of all federal funds for the project.

The contractor must submit the following information to the resident engineer when requesting a waiver to Buy America requirements:

- A detailed description of the waiver item

- Item cost—obtained from the manufacturer or supplier
- The country of origin for the product
- The reason for the waiver

The resident engineer must provide the following information when preparing a waiver request for the FHWA engineer:

- The contractor's waiver submission and support information
- Federal-aid project number, description, project cost, and location
- Narrative of the efforts taken to locate a domestically manufactured product
- Analysis of proposed redesigns using available domestic products

3-605 Brand or Trade Names and Substitutions

When specific brand or trade names are used to designate required products, the contractor may furnish other products that are of equal or better quality.

A product is not necessarily equivalent merely because it is on an Authorized Material List published by Caltrans. These lists indicate that the products meet the general qualifications. However, some of the listed products may not meet the specific needs of the project or may not be appropriate for a particular location because of factors such as climate conditions or maintenance difficulties. Consult with the responsible unit (the Design Unit, Traffic Unit, Maintenance Unit, or METS, for example) before making decisions about the acceptability of substitutes.

3-606 Buy Clean California Act

Section 6-1.06, "Buy Clean California Act," of the special provisions includes both authorized material list and environmental product declaration (EPD) requirements for eligible materials or products, including carbon steel rebar, structural steel, flat glass, and mineral wool board insulation.

Review applicability of these provisions based on project cost, project duration, and use quantities of the eligible materials by source. Projects or quantities not meeting the specified criteria are exempt from Buy Clean California Act (BCCA) requirements. Discuss project specific BCCA requirements at the preconstruction conference as applicable.

For carbon steel rebar material subject to BCCA compliance, the source mill must be on the authorized material list for BCCA compliant mills. These mills have demonstrated compliance with the Department of General Services' maximum acceptable global warming potential limits. Review source mill information on Form CEM-3101, "Notice of Materials to be Used," for authorized material list compliance. Upon delivery of such materials to the project, review the certified mill test reports to verify the source mill is listed on the authorized material list. Carbon steel rebar material subject to BCCA compliance that is not from a source on the authorized material list may not be used.

For structural steel subcategories, mineral wool board insulation, and flat glass materials subject to BCCA compliance, contractors must submit facility-specific material or product EPDs as an action submittal at least 15 days before installing the material or product. The EPD must show that the global-warming potential of the material or product is less than or equal to the maximum acceptable global-warming potential values published by the Department of General Services at:

<https://www.dgs.ca.gov/>

Subject materials with EPDs greater than their maximum acceptable value cannot be used on the project. If the contractor fails to provide an EPD for structural steel subcategories, mineral wool board insulation, or flat glass materials subject to BCCA compliance, installation may not proceed and no compensation can be made, including materials-on-hand payments, for these materials. Work with your METS representative in reviewing EPD action submittals. Upon delivery of such materials to the project, review the certified mill test reports to verify the source mill is consistent with the compliant facility-specific EPD.

EPD submittals are made by PDF copy to the resident engineer and through the Data Interchange for Materials Engineering site at:

<https://dime.dot.ca.gov/>

Contractors will need to register in advance to use the data interchange site.

EPDs are developed in conformance with program category rules established by program operators. Contractors are to use the product category rule in effect on the date of bid opening unless otherwise authorized. Only consider a more recently dated product category rule if requested by the contractor. If a product category rule for material or product has expired without replacement as of the bid opening date, no EPD is required for that material or product. METS maintains an up-to-date listing of product category rules, in addition to related Buy Clean California Act information at:

<https://dot.ca.gov/programs/engineering-services/environmental-product-declarations>

Regardless of the specified means of for BCCA compliance, either authorized material list or EPD action submittal, the contractor is required to report the represented quantity of BCCA compliant material for each shipment within 5 business days of receipt at the job site. This reporting is done through the Data Interchange for Materials Engineering site.

3-607 Quality Assurance

Quality assurance encompasses all materials and construction activities on a project and directly affects the service life of a transportation facility.

Section 6-2, "Quality Assurance," of the *Standard Specifications* includes provisions covering the contractor's quality control over the work and Caltrans' verification and acceptance of the work.

Section 6-2.02, "Quality Control," of the *Standard Specifications* informs the contractor of general quality control requirements regarding the materials

incorporated into the work. Verify that the contractor maintains a quality control program that includes employing appropriate personnel and keeping thorough quality control records.

Section 6-2.03, "Department Acceptance," of the *Standard Specifications* allows the resident engineer access to the material sources to inspect, sample, and test materials for Department acceptance. Refer to Section 3-501, "General," of this manual for information regarding safe access.

Resident engineers and their authorized representatives have a primary duty to inspect the work and to sample and test the materials incorporated into the work to verify compliance with the *Standard Specifications*, special provisions, and plans.

Deduct retesting costs. Contact the district materials engineer who oversees the district materials lab for guidance on determining the costs. For hot mix asphalt verification retesting, refer to Section 39-2.01A(4)(b), "Job Mix Formula Verification," of the *Standard Specifications*.

Additional information about quality assurance can be found in the Division of Construction publication *Construction Quality Assurance Program Manual* at:

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

3-608 Out-of-State Fabrication

Section 6-2.01E, "Material Source Inspection and Testing," of the *Standard Specifications* includes deductions in payment for fabrication at some distance from Sacramento and Los Angeles. In addition, some special provisions may modify the amount to be deducted. Deduct the appropriate amount, applying it as an administrative deduction on estimates that include payment for the item. Use a standard description of "Out of State Inspect" on Form CEM-6101, "Project Record—Estimate Request." This deduction should be made in whole, when appropriate. However, if the deduction is large, the resident engineer has the option to deduct incremental amounts until the full deduction is made.

3-609 Testing by Caltrans

In addition to the California Test methods, the *Standard Specifications* contain references to the standards and tests of the American Association of State Highway and Transportation Officials and the American Society for Testing and Materials.

California test methods are available at:

<https://dot.ca.gov/programs/engineering-services/>

American Association of State Highway and Transportation Officials, American Society for Testing and Materials, and other test methods are available by clicking on the Material Standards (ASTM/AASHTO) link to get to the IHS Markit database.

Whenever samples are taken from materials sites, the resident engineer must assure that the samples are representative of material being used. Degradation and segregation may occur in aggregates between the processing operation and their

incorporation in the work. The resident engineer cannot assume that material satisfactorily tested at the source or at the processing plant is still satisfactory at the job site. To assure specification compliance, confirm the contractor tests at the frequencies shown in the specifications as the material is being incorporated into the work. Also, perform and record acceptance sampling and testing as required by Section 6-1, "Sample Types and Frequencies," of this manual. Deliver acceptance samples to the district laboratory within 1 business day for projects within 50 miles and within 2 business days for projects more than 50 miles from the district laboratory, except where sampling or test methods conflict. Report acceptance test results to the contractor within 2 business days of receipt from the laboratory. The contractor must be advised that all test results are available for their inspection. Accordingly, test results must remain in the project files. Provide copies of acceptance tests to the contractor upon request.

3-609A Operating Range and Contract Compliance

Section 25, "Aggregate Subbases"; Section 26, "Aggregate Bases"; Section 27, "Cement Treated Bases"; Section 28, "Concrete Bases"; Section 37, "Bituminous Seals"; and Section 90, "Concrete," of the *Standard Specifications*, all contain provisions for an acceptable range of test results. If a test result fails to meet the requirements of the operating range but meets contract compliance, the contractor usually needs to make some change in operations to ensure that subsequent test results meet the operating range requirements. The resident engineer should document the contractor's actions and any off-site testing done before the next day's work.

If a test result fails to meet the specified value for contract compliance, the result should be treated just like any other failing test result. However, if the contractor writes a request, the resident engineer may consider leaving the material in place and applying the specified deduction, if the specifications allow. The contractor's written request, along with documentation of reasons for leaving the material in place and the contractor's actions, is sufficient for the contract records. A change order accepting out-of-specification material is not required in this case because the specifications provide the procedure for acceptance.

The resident engineer must inform the contractor promptly of test results that indicate unacceptable or borderline work.

3-610 Testing by the Contractor

The contractor must be satisfied at all times that the quality of materials entering the work and the work performed, regardless of who supplies the materials or performs the work, will meet the contract requirements. For acceptance of materials or work, resident engineers must not use as documentation any tests the contractor performs to control the work, except where verification testing is specified.

3-610A Action Limit and Suspension Limit

Action and suspension limits are similar to operating range and contract compliance except they apply to the contractor's quality control testing as specified in Section 40, "Concrete Pavement," and Section 41-9, "Individual Slab Replacement With Rapid Strength Concrete," of the *Standard Specifications*.

3-611 Suspected Fraudulent Test and Inspection Reports

When fraudulent tests or inspection reports are suspected, discuss the situation with the Division of Construction field coordinator. Contact the district materials engineer or METS for assistance in evaluating the reports. Retest the material represented by suspect tests, as appropriate. If after investigating, fraud is still suspected, the deputy district director provides the facts in writing to the Division of Construction field coordinator.