



Pumping Equipment and Controls

Revision and Approval

Revision	Date	Nature of Changes	Approved By
0	04-25-2023	Original Issue	Richard Foley

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Background

This process establishes Structure Construction (SC) responsibilities and procedures for review and authorization of submittals, quality assurance, materials, and construction of pumping equipment and controls. The Structure Representative (SR) is encouraged to maintain continuous contact with the Division of Engineering Services (DES); Transportation Architect and DES Office of Electrical, Mechanical, Water and Wastewater (TAEMWW) to keep them informed of the work progress, to discuss any problems encountered, and to coordinate TAEMWW personnel inspections during construction.

Prior to reviewing this Bridge Construction Memo (BCM), it is essential to review the [Contract Specifications](#), Section 74, *Pumping Equipment and Controls*, that this BCM is based on as identified in the title block above. The information in the *Contract Specifications* typically will not be repeated in the text of this BCM.

Process Inputs

1. Contractor submittals for pumping equipment and controls

Procedure

1. All work associated with this process is charged as [Project Direct – Construction](#).
2. Inspection of field work for this process is:
 - a. [Benchmark](#) for:

- i. Activities as deemed appropriate
 - ii. Checking layout, and installation of pump and pumping equipment.
 - b. Intermittent for:
 - i. Review and authorization of material delivered to the job site
 - ii. Verification of pumping equipment testing.
 - c. Continuous for:
 - i. Operational and performance pump tests.
3. Before construction begins:
- a. Verify with the Resident Engineer (RE) that the Contractor has submitted Form CEM-3101, *Notice of Materials to Be Used*, and all pump materials to be used have been included.
 - b. Review the following Divisions of the *Building Construction Manual*:
 - i. Divisions 0200 through 1600 as applicable, and note which inspection tasks will be done by the appropriate Designer from DES Office of Transportation Architecture and Electrical, Mechanical, Water and Wastewater (TAEMWW) as some items may not be within SC expertise.
 - ii. Division 11, *Equipment*, Section *Sewage Pumping Station Equipment*, for tips and suggestions. Note that this section is found on page 6 of Division 11 and contains background information which is also applicable to drainage pumps.
 - c. Review the *Construction Manual*, Chapter 4, Section 4-74, *Construction Details – Pumping Equipment and Controls*, for tips and suggestions.
 - d. For a general overview of interacting with various DES functional units and other project stakeholders, refer to BCM 99-1, *Building Construction – General Requirements*, Procedure steps 3.a. through 3.e.
 - e. Conduct an internal preconstruction meeting with the project design team and RE. Discuss the following with the designers, Materials and Engineering Testing Services (METS), Caltrans Maintenance personnel (including Structures Maintenance and Investigation (SM&I) Bridge Crew Supervisor and District Electrical Area Superintendent), Geotechnical Services, and the Facility Supervisor.
 - i. Inquire about any design concerns, materials, or complex situations.
 - ii. Discuss inspection responsibilities and inspection frequency required.

- iii. Discuss the building construction submittal and shop drawing requirements, procedures, roles and responsibilities including those described in:
 - 1. TAEMW&W Memo to Designers ([MTD](#)) 9-4, *Shop Submittals*.
- iv. Confirm which activities the RE will take the lead on. These typically include:
 - 1. Coordinating service interruption requests with the State Facility Supervisor
- v. Discuss the following with the State Facility Supervisor:
 - 1. Existing equipment in the State facility.
 - a. Ensure thorough documentation (photos and notes) of pre-job conditions; e.g., what is working, and what is not working.
 - 2. Coordination of facility operations with contract work.
 - 3. Schedule of anticipated inspections.
 - 4. Establish contact with all third-party stakeholders to coordinate inspection and other project requirements
- f. Contact SM&I Bridge Crew Supervisor and District Electrical Area Superintendent to:
 - i. Plan the work.
 - ii. Verify controlling dimensions prior to ordering equipment.
 - iii. Review pump house log-books.
 - iv. Where necessary, coordinate confined space ventilation.
- g. Review and provide authorization concurrence for pump submittals. As part of this process:
 - i. Note that pump submittals routed through SC Office Associates (in lieu of OSD, Documents Unit) are authorized or rejected by the Designer of Record (DOR) once comments from all reviewing parties have been compiled and concurrence has been provided. The SR only provides review comments to the DOR via SC Office Associates as opposed to directly authorizing these submittals. Authorized pump submittals are returned to the SR by SC Office Associates. SRs must ensure submittals are received in a timely fashion to be authorized prior to incorporation into the project.
 - ii. Distribute authorized submittals to the Assistant Structure Representative (ASR).

- h. Discuss pump installation and proposed usage to maintain total pumping capacity with the Contractor.
 - i. Remind the Contractor of their responsibility for maintenance and service even if work occurs in the dry season (e.g., drainage pumps). Obtain padlock keys from the Bridge Crew Supervisor or the RE.
 - ii. Existing pumps shall be inspected in accordance with the Caltrans [Maintenance Manual](#), Volume 1, [Chapter J1](#), *Tunnels, Tubes, Ferries, and Pumping Plants*, Section J1.04, *Pumping Plants*.
 - 1. During the rainy season, the pumping plants shall be inspected, and test operated at least once every two weeks.
 - 2. During the off season, the pumping plants shall be inspected, and test operated at least monthly.
 - i. Review the Division of Construction [Code of Safe Practices](#) and if necessary, request air monitoring devices and confined space training from BCE.
- 4. During construction:
 - a. Review authorized submittals prior to inspecting work. Compare all materials installed and/or to be installed with their corresponding submittals.
 - b. Collect all required documents (maintenance and operations manual, etc.) of equipment and material delivered to the job site. Ensure material is authorized.
 - i. If some materials are to be field released, perform acceptance using [Form CEM-4102](#), *Material Inspected and Released on Job*. Refer to the following Sections of the *Construction Manual*, Chapter 6, *Sampling and Testing*, Section 6-203, *Acceptance of Manufactured or Fabricated Materials and Produces – Manufactured or Fabricated Materials and Product Acceptance*:
 - 1. Section 6-203B, *Materials Accepted on the Basis of Authorized Material List*
 - 2. Section 6-203C, *Materials Accepted on the Basis of a Certificate of Compliance*
 - 3. Section 6-203D, *Field Inspection and Release by the Resident Engineer*
 - ii. Attach the product data sheets, certificates of compliance, and quality assurance test results.
 - c. Coordinate the required inspection and testing, considering the following:

- i. Utilize daily site inspections to anticipate the Contractor's inspection needs.
 - ii. Forward the Contractor's requests for inspection to the project design team (appropriate functional unit from TAEMWW). Verify that the work will be ready for inspection on the date requested.
 - iii. TAEMWW provides evaluation of pump testing results.
 - iv. Receive written results of the inspection and testing; review and transmit to the Contractor. If corrective work is needed, determine whether follow-up inspection is needed.
 - d. Verify that quality control is being performed by the Contractor and that requirements of the contract are adhered to, including:
 - i. General specifications such as painting, care and cleaning, providing maintenance instruction, providing total pumping capacity and maintenance requirements, and conforming with the requirements pertaining to the use of pumps before contract acceptance.
 - ii. Requirements for drainage pumping equipment such as furnishing specialty tools required for assembly and adjusting of equipment.
 - iii. Requirements for pumping plan electrical equipment such as providing a factory-authorized service representative to inspect and test equipment, providing training for Department personnel in maintenance and operation of the pump controller, and providing 12 months of full maintenance by the manufacturer.
 - iv. Requirements for booster pumps such as providing a closeout submittal, providing a maintenance and operations manual binder, and providing an appropriately sized concrete pad.
 - e. For existing pumps, review contract requirements for pump inspection frequency as outlined in step 3.g.ii.
 - f. Process progress payments in accordance with the authorized schedule of values.
 - g. Document all inspection, construction, and quality assurance activities pertinent to this BCM in the daily reports per [BCM C-7](#), Daily and Weekly Reports.
5. Following construction:
 - a. Promptly notify the RE that the work is complete. Note that the construction contract standards require the Contractor to coordinate with utility companies to continue, change, or discontinue electrical service to the pump plant.

- b. Coordinate with the RE to schedule a walk-thru meeting and hand over the following to SM&I or the Facility Supervisor:
 - i. Parts lists and service instructions packaged with, or accompanying the equipment including:
 - 1. Operating and maintenance instructions.
 - 2. Manufacturer's warranties, and qualification data.
 - ii. As-built plans and as-built shop drawings.
 - c. Review closeout submittal for completeness. Obtain concurrence from the appropriate designer.
 - d. Transmit maintenance and operations manual to the appropriate design and maintenance personnel.
6. File all project documentation (correspondence, materials acceptance documentation, daily reports, etc.) in the appropriate category in the project records as specified in the *Construction Manual*, Chapter 5, [Section 5-102](#), *Contract Administration – Project Records and Reports – Organization of Project Documents*.

Process Outputs

- 1. Completed pumping equipment and controls, conforming to contract requirements.
- 2. Authorized submittals
- 3. Operational and performance test reports
- 4. As-builts, pumping equipment paperwork, and maintenance and operations manual
- 5. Daily reports

Attachments

None