

## SECTION 03 11 14

### FALSEWORK

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Layout of falsework
- B. Falsework construction.
- C. Removal of falsework.

##### 1.02 MEASUREMENT AND PAYMENT

- A. Measurement: Falsework for concrete structures will not be measured separately for payment.
- B. Payment: Falsework for concrete structures will be paid for as part of the Contract unit price or lump-sum price for the associated concrete work as indicated in the Bid Schedule of the Bid Form.

##### 1.03 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM):
  - 1. ASTM A36/A36M Specification for Carbon Structural Steel
- B. California Code of Regulations, Title 8:
  - 1. Chapter 4, Subchapter 4, Construction Safety Orders
- C. State of California, Department of Transportation (CalTrans), Standard Specifications:
  - 1. Section 12 Construction Area Traffic Control Devices
  - 2. Section 51 Concrete Structures, Section 51-1.06 "Falsework"
- D. State of California, Department of Transportation (Caltrans), Office of Structure Construction:
  - 1. Falsework Manual
- E. West Coast Lumber Inspection Bureau (WCLB):
  - 1. WCLB No. 17 Standard Grading Rules

##### 1.04 FALSEWORK DESIGN CRITERIA

- A. Regulatory Requirements: Falsework shall comply with applicable requirements of the California Code of Regulations, Title 8, Construction Safety Orders.
- B. Design Standards:

1. In addition to the requirements specified herein, comply with the Caltrans Standard Specifications Section 51-1.06, "Falsework," and the Caltrans Falsework Manual.
  2. All lumber, posts, and timbers shall be graded and grade-marked in accordance with WCLB No. 17. Provide stress-graded lumber for all structural members, conforming with the above-specified WCLB No. 17.
- C. Design Loads: Design loads for falsework shall conform with applicable requirements of Caltrans Standard Specifications, Section 51, Concrete Structures, and the Caltrans Falsework Manual.
- D. Design Stresses, Loadings, and Deflections: The maximum allowable design stresses, loadings and deflections shall conform with applicable requirements of Caltrans Standard Specifications, Section 51, Concrete Structures, and the Caltrans Falsework Manual.

### 1.05 SUBMITTALS

- A. Requirements: Refer to Section 01 33 00 - Submittal Procedures, and Section 01 33 23 - Shop Drawings, Product Data, and Samples, for submittal requirements and procedures. Shop Drawings and supporting calculations for falsework shall be submitted to the Engineer for review and approval.
- B. Shop Drawings and Calculations:
1. Submit drawings and design calculations, prepared by an engineer licensed in the State of California for all falsework proposed for concrete structures requiring falsework support. Falsework design calculations shall include the stresses and deflections in load supporting members.
  2. Where the height of any portion of the falsework, as measured from the ground line to the soffit of the superstructure, exceeds 14 feet, or where any individual falsework clear-span length exceeds 16 feet, or where provision for vehicular or pedestrian traffic through the falsework is made, such drawings shall be sealed and signed by an engineer who is currently registered as a civil or structural engineer in the State of California.
  3. Except for placement of foundation pads and piles, do not start construction of any unit of falsework until the Engineer has approved the Shop Drawings and calculations for that unit.
  4. Falsework forms shall be designed to carry the load imposed upon them without exceeding the estimated soil bearing values and anticipated settlements, and without relying on existing structures for stability or support.
  5. When footing type foundations are proposed, determine the bearing value of the soil and show the values assumed in the design of the falsework on the falsework drawings.
  6. When pile type foundations are proposed, show the maximum horizontal distance that the top of a falsework pile may be pulled out of position to support its cap. Also, show the

maximum allowed deviation of the top of the pile, in its final position, from a vertical line through the point of fixity of the pile.

7. Show anticipated total settlements of falsework and forms. These shall include falsework footings settlement and joint take-up. Falsework supporting deck slabs and overhangs on girder bridges shall be designed so that there will be no differential settlement between the girders and the deck forms during placement of deck concrete.
8. Foundations for individual steel towers where the maximum leg load exceeds 30 kips shall be designed and constructed to provide uniform settlement under all legs of each tower under all loading conditions.
9. The support systems for form panels supporting concrete deck slabs and overhangs on girder bridges shall also be considered to be falsework, and shall be designed as such.
10. Temporary bracing shall be provided, as necessary, to withstand all imposed loads during erection, construction, and removal of falsework. The falsework drawings shall show provisions for such temporary bracing or methods to be used to conform to this requirement during each phase of erection, construction, and removal. Wind loads shall be included in the design of such bracing or methods.
11. Design of falsework will not be approved by the Engineer unless based on the use of loads and conditions that are no less severe than those specified in Article 1.04.C herein, and on the use of stresses and deflections that are no greater than those specified in Article 1.04.D. The Contractor shall be responsible for the proper evaluation of falsework materials and for the design of falsework to safely carry the actual loads imposed.

- C. Forming System: Furnish form design and materials data for each forming system to be used for exposed surfaces. Coordinate with the work of Section 03 11 00 - Concrete Forming.

## **1.06 SPECIAL LOCATIONS**

- A. In addition to the Falsework Design Criteria specified herein, falsework over roadways or railroads that are open to traffic shall be designed and constructed in accordance with applicable requirements of Caltrans Standard Specifications, Section 51, Concrete Structures, and the Caltrans Falsework Manual.

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS**

- A. Requirements: Materials for falsework shall conform with applicable requirements of the Caltrans Standard Specifications, Section 51, Concrete Structures, and the Caltrans Falsework Manual, except as indicated or specified otherwise herein.
- B. Lumber: All falsework lumber, posts, and timbers shall be graded and grade-marked in accordance with WCLB No. 17, dressed or rough. Provide stress-graded lumber for all falsework lumber, conforming with the above-specified WCLB No. 17.
- C. Steel: ASTM A36/A36M, structural shapes as required.

**PART 3 - EXECUTION**

**3.01 LAYOUT OF FALSEWORK**

- A. Locate and stake out all forms and falsework, and establish all lines, grades, and elevations.

**3.02 FALSEWORK CONSTRUCTION**

- A. Construct falsework to conform with the approved falsework Shop Drawings and applicable requirements of the Caltrans Standard Specifications, Section 51, Concrete Structures, and the Caltrans Falsework Manual.

**3.03 REMOVAL OF FALSEWORK**

- A. Release and removal of falsework shall conform with applicable requirements of the Caltrans Standard Specifications, Section 51, Concrete Structures, and the Caltrans Falsework Manual.

**END OF SECTION 03 11 14**