

**SECTION 03100
FORMWORK**

PART 1 - GENERAL

1.01 DESCRIPTION.

Requirements specified in the Conditions of the Contract and Division 1 form a part of this Section. Provide formwork for cast-in-place concrete as indicated, specified, and required.

A. Work Included in This Section. Principal items are:

1. Furnishing, erection, and removal of forms.
2. Shoring and bracing.
3. Setting of embedded items and setting of pipe sleeves for mechanical and electrical work under direction of respective trade requiring holes for passage of pipe or conduit.

B. Related Work Not Included in This Section.

1. Furnishing embedded items with setting instructions.
2. Reinforcement.
3. Concrete mixing, placing and finishing.

1.02 QUALITY ASSURANCE.

A. Requirements of Agencies. The requirements of California Construction Safety Orders Section 1717 and OSHA Part 1926, Section 1926.701 apply to the Work of this Section, and the Contractor shall prepare and maintain at least one copy of the required Drawings at the site. The enforcing agency will not approve the Drawings and the Contractor shall submit evidence to the California Division of Industrial Safety to justify the formwork and shoring designs. Design of the structures shown on the Drawings does not include any allowance or consideration for imposed construction loads. Three copies of the Contractor's shoring and formwork drawings shall be filed with the Owner for record purposes only and not for review or approval. Forms, shoring and falsework shall be adequate for imposed live and dead loads, including equipment, height of concrete drop, concrete and foundation pressures, stresses, lateral stability, and other safety factors during construction.

B. Standards and Tolerances. Formwork shall comply with Section 303 of the Public Works Specifications "GREENBOOK", ACI 347R-03 Guide to Framework for Concrete, except as exceeded by the requirements of regulatory agencies or as otherwise indicated or specified. Formwork shall be designed and constructed to produce finished concrete conforming to tolerances given in Paragraph 2.4.1 of ACI 347R-03 and ACI 117-06 / 117R-06 Standard Tolerances for Concrete Construction and Materials and Commentary.

1.03 SHOP DRAWINGS.

Concrete construction joints and expansion joints shall be of the types and locations indicated. Submit shop drawings for approval showing proposed location and type of required construction for any joints not shown on the Drawings, and sequence of forming and concrete placing operations. Submit shop drawings at least 15 days working days in advance of form fabrication.

PART 2 - PRODUCTS

2.01 LUMBER.

WWPA No. 1 Structural Light Framing or No. 1 Structural Joists and Planks, or approved equal. Board forms, if used, shall be No. 2 Common or better, T&G or shiplap, S1S2E or better.

PART 3 - EXECUTION

3.01 FORM TYPES.

A. General Concrete. Use either plywood or board forms for concealed surfaces, or form as specified for smooth surface concrete.

3.02 FORM CONSTRUCTION.

Build forms to exact shapes, sizes, lines, and dimensions as required to obtain accurate alignment, location and grades, and level and plumb work in finished structures. Provide for openings, offsets, bulkheads, anchorages, and other required features. Make forms easily removable without hammering or prying against concrete. Construct forms so that no sagging, leakage, or displacement occurs during and after pouring of concrete.

A. Reuse. Clean and recondition form material before reuse.

3.03 EMBEDDED PIPING AND ROUGH HARDWARE

All trades which require openings for the passage of pipes, conduits, and other inserts shall be consulted and the necessary pipe sleeves, anchors, or other required inserts shall be properly and accurately installed by respective trades. Openings required by other trades shall be reinforced as indicated and required. Conduits or pipes shall be located so as not to reduce the strength of the construction, and in no case shall pipes other than conduits be placed in a slab 4-1/2" or less in thickness. Conduit buried in a concrete slab shall not have an outside diameter greater than 1/3 of the thickness of the slab nor be placed below bottom reinforcing steel or over top reinforcing steel.

FIELD QUALITY CONTROL.

Inspection of Forms. Refer to Section "Cast-In-Place Concrete".

3.04 REMOVAL OF FORMS AND SHORING.

Do not remove forms or shoring until concrete has attained sufficient strength to support its own weight and all imposed construction and permanent loads.

END OF SECTION 03100