

SECTION 31 41 00
SHORING

PART 1 - GENERAL

1.1 DESCRIPTION

A Scope:

1. This section specifies requirements for sheeting, shoring, and bracing of trenches greater than 5 feet in depth or where required to protect adjacent property, improvements or grades and _____. The Contractor shall provide all labor, equipment, materials, and services necessary.

B Design Requirements:

1. The Contractor shall design sheeting, shoring, and bracing in accordance with Article 6 of CAL/OSHA and the California State Labor Code. The standards of design referred to in the Labor Code shall be those of CAL/OSHA.
2. Design excavation support systems to withstand earth pressures, hydrostatic pressures, bottom heave, equipment loads, applicable traffic and construction loads, and other surcharge loads to allow safe construction without movement or settlement of the ground and to prevent damage to or movement of adjacent structures, streets, and utilities. Design each member or support element with appropriate safety factors.
3. Acceptable excavation support methods include the use of trench boxes, suitable moving support systems, steel sheet pilings, soldier piles and lagging, jet grouted structures, secant pile structures, structural steel wales and struts, liner plates, and timber. If soldier piles are used, insert in predrilled holes. Horizontal strutting below the barrel of a pipe and the use of pipe as support are not acceptable.
4. Provide construction stage loadings for a staged removal of the support system that conforms to the pipe, structure placement, and indicated backfill.
5. Compaction of foundation, bedding, haunching, and backfill shall extend to the undisturbed trench wall during staged removal of the support system.
6. Horizontal strutting below the barrel of a pipe and the use of pipe as support are not acceptable.

1.2 RELATED SECTIONS

- A This section contains specific references to the following related sections. Additional related sections may apply that are not specifically listed below.

1. _____

1.3 REFERENCES

- A This section contains references to the following documents. They are a part of this section as specified and modified. Where a referenced document contains references to other standards, those documents are included as references under this section as if referenced directly. In the event of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.
- B Unless otherwise specified, references to documents shall mean the documents in effect at the time of Advertisement for Bids or Invitation to Bid (or on the effective date of the Agreement if there were no Bids). If referenced documents have been discontinued by the issuing organization, references to those documents shall mean the replacement documents issued or otherwise identified by that organization or, if there are no replacement documents, the last

version of the document before it was discontinued. Where document dates are given in the following listing, references to those documents shall mean the specific document version associated with that date, regardless of whether the document has been superseded by a version with a later date, discontinued or replaced.

Reference	Title
OSHA	OSHA Safety Regulations (29 CFR, Part 1926, Subpart P, Excavations)
CAL/OSHA	State of California Construction Safety Orders
--	California State Labor Code

1.4 SUBMITTALS

A Procedures: Section 01 33 00, SUBMITTAL PROCEDURES.

B Action Submittals:

1. A copy of this entire specification section, with addendum updates included, and referenced and applicable sections, with addendum updates included, with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements. A check mark shall denote full compliance with a paragraph as a whole. If deviations from the specifications are indicated, and therefore requested by the Contractor, each deviation shall be underlined and denoted by a number in the margin to the right of the identified paragraph, referenced to a detailed written explanation of the reasons for requesting the deviation. The Owner - DO NOT USE!!! Use "Owner's Spec Term" GT shall be the final authority for determining acceptability of requested deviations. The remaining portions of the paragraph not underlined will signify compliance on the part of the Contractor with the specifications. Failure to include a copy of the marked-up specification sections, along with justification(s) for any requested deviations to the specification requirements, with the submittal shall be sufficient cause for rejection of the entire submittal with no further consideration.
2. Submit design calculations, shop drawings, and detail drawings that demonstrate conformity with OSHA regulations and suitability for design loads and installation methodology.
 - a. The design shall be stamped and signed by a Registered Professional Engineer of the State of _____.
3. Submit shop drawings showing dimensions, elevation, and structural details for each utilized excavation support system. Include on the drawings any required construction sequence, loading, testing, monitoring, and re-bracing/removal requirements. The design shall be stamped and signed by a Registered Professional Engineer of the State of _____.

PART 2 - PRODUCTS

2.1 GENERAL

A The Contractor shall submit as product data to the Owner information required by Section 6705 of the California State Labor Code.

2.2 TRAFFIC BEARING PLATES:

- A To meet the DOT Specification.
- B Steel plates to be milled into the asphalt so that they are flush with the existing surface. A written approval from Agency having Jurisdiction is required to install steel plates that are not flush with the existing surface.

PART 3 - EXECUTION

3.1 GENERAL

- A The construction of sheeting, shoring, and bracing shall not disturb the state of soil adjacent to the trench and below the excavation bottom.
- B Trench sheeting below the top of a pipe shall be left in place.

3.2 SEQUENCE

- A Trench excavation shall not be started until the design for trench support has been accepted by the Owner.

END OF SECTION