



# Chapter 1: Introduction

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## 1-1 Purpose and Scope

The *Bridge Removal Manual* has been issued by the Department of Transportation's Division of Engineering Services (DES), Structure Construction (SC). The intended purpose is to provide an educational resource and administrative support to the SC staff who are in responsible charge of bridge removal on State highway projects. Proper use of the *Bridge Removal Manual* requires a thorough understanding of the principles of civil engineering design and construction, and familiarity with the relevant [Contract Specifications](#). The [Falsework Manual](#) is referenced several times and is an indispensable resource when considering stability, temporary supports, or protective covers during bridge removal operations.

The scope of this manual is to provide a resource for typical bridge removal on State highway projects and is not intended to cover all possible bridge removal scenarios. While the clear majority of Caltrans' projects with bridge removal can benefit from the use of this manual, there are many unique bridges and removal methods that this manual does not cover. Engineering judgment will be required to determine the applicability of this manual to a specific bridge removal project.

## 1-2 Statement of Structure Construction Policy

Structure Construction (SC) policy is to remove bridges (or portions thereof) in a safe, controlled manner that protects the public, workers, and the environment. This is accomplished through a thorough review and authorization process of the bridge removal work plan and verifying that the authorized plan is properly implemented during field removal activities.

## 1-3 Contract Specifications and References

Some of the key requirements for bridge removal can be found in the following [Contract Specifications](#) and references:

1. Caltrans *Contract Specifications*:
  - a. Section 5, *Control of Work*:
    - i. Section 5-1.02, *Control of Work – Contract Components*: Item 1.7 – *Supplemental Project Information*, includes permits and agreements negotiated by the State that are part of the contract and can include work and restrictions that can have a major impact on bridge removal.
  - b. Section 7, *Legal Relations and Responsibility to the Public*:
    - i. Notice of responsibility to the public including a section on Cal/OSHA requirements.

- c. Section 12, *Temporary Traffic Control*:
    - i. The requirements for temporary access routes for pedestrians which must be maintained, are found in this section.
  - d. Section 13, *Water Pollution Control*:
    - i. Demolition as used in the context of Section 13 includes all bridge removal activities specified elsewhere in the contract documents. The goal is to handle and control all manner of waste as close as possible to its source. This includes concrete slurry and general debris control. The purpose is to keep all waste from entering the waters of the State. The specific emphasis is placed upon stormwater runoff and exposures over and adjacent to the waters of the State. In some instances, specific methods are prescribed to deal with debris, e.g., the use of a vacuum to remove concrete slurry immediately after it is produced. Good housekeeping is an important element of both pollution control and job site safety.
  - e. Section 14, *Environmental Stewardship*:
    - i. Since the majority of bridges are either habitat for biological resources or are adjacent to such habitat, environmental stewardship is a significant consideration in bridge removal.
  - f. Section 16, *Temporary Facilities*:
    - i. The requirements for temporary facilities used to move pedestrians through the work site can be found in this section.
  - g. Section 48, *Temporary Structures*:
    - i. Section 48 is referenced in Section 60-2.01A, *Existing Structures – Structure Removal – General*, where temporary covers, supports, and bracing are required for bridge removal work. Therefore, Section 48 requirements for engineering calculations, plans, and review are applicable to bridge removal work.
  - h. Section 60, *Existing Structures*:
    - i. Section 60 addresses bridge removal, including partial bridge removal. This section includes most of the bridge removal requirements including submittal requirements, quality assurance, materials, protective covers, preliminary work, and the requirements for the Contractor’s engineer.
2. Project *Special Provisions*:
- a. The project *Special Provisions* will contain contract specific requirements and restrictions above and beyond what is in the *Standard Specifications* and will frequently include requirements outlined in the project permits and agreements. A careful review of the *Special Provisions* is necessary to ensure

all requirements from the project permits and agreements are incorporated and adhered to.

3. *Information Handout*:

- a. The *Information Handout* contains the project specific permits and agreements including railroad agreements, environmental permits, asbestos report, and lead report when applicable.

## 1-4 Contractual Relationships

The Contractor is responsible for developing and implementing the bridge removal work plan. The Structure Representative is responsible for reviewing and authorizing the bridge removal work plan and verifying that the Contractor follows the authorized plan. The Contractor's engineer that signed and sealed the bridge removal work plan is the engineer in responsible charge of the bridge removal work.

## 1-5 Cal/OSHA Demolition References

There are many specific Cal/OSHA regulations covering demolition and those references will not be covered in this section specifically. Rather, this section highlights some areas of importance regulated by Cal/OSHA in relation to demolition. The primary hazards associated with demolition are:

1. Structure collapse
2. Falls from elevated work areas
3. Exposure to noise and hazardous air contaminants, including crystalline silica, lead paint, and asbestos
4. Falling debris
5. Impalement
6. Heavy construction equipment and traffic.

## 1-6 Definitions

**ACM** – Asbestos containing material. The Environmental Protection Agency (EPA) ruled that bridges are considered as structures that fall within the category of “facility” as outlined in Title 40, § 61.141, *Definitions*, of the Code of Federal Regulations. The EPA further stated that the National Emission Standards for Hazardous Air Pollutants require bridge concrete to be sampled for the presence of asbestos before demolition to determine whether the concrete (suspect material) is ACM.

**As-builts** – Historical record of a bridge’s design and modifications implemented during construction or maintenance.

**Authorized reviewer** – The Structure Representative or their delegated assistant in responsible charge of reviewing the bridge removal work plan.

**Bridge removal, demolition** – These words are used interchangeably throughout this manual. Demolition is sometimes described as performing work in reverse order from construction. In transportation industry practice, bridge removal and bridge construction are often linked in widenings or barrier upgrades and are, at times, almost indistinguishable. Bridge removal/demolition is the planned, systematic removal or partial removal of a bridge, in a safe, controlled manner.

**CalEPA; California Environmental Protection Agency** – State agency, whose mission is to restore, protect, and enhance the environment, to ensure public health, environmental quality, and economic vitality.

**Cal/OSHA; California Department of Industrial Relations, Division of Occupational Safety and Health (DOSH)** – Cal/OSHA protects and improves the health and safety of working men and women in California.

**CARB; California Air Resources Board** – The primary State agency responsible for actions to protect public health from the harmful effects of air pollution. CARB guides the activities of 35 local air pollution control districts.

**Contract documents** – The combined documents, including the *Standard Specifications*, *Special Provisions*, *Information Handout*, project plans, standard plans, change orders, permits, licenses, agreements, and certifications that encompass the definition and scope of work as agreed to by Caltrans and the Contractor.

**CDFW; California Department of Fish and Wildlife** – Manages California’s diverse fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public. CDFW administers the Lake and Streambed Alteration (LSA) Program and reviews projects that would alter any river, stream, or lake. CDFW must be notified if the project diverts or obstructs the natural flow of any river, stream, or lake; or if the project changes the bed, channel, or bank of any river, stream, or lake.

**Demolition** – Refer to bridge removal

**DES** – Caltrans Division of Engineering Services. This is the Division of Caltrans responsible for the design and construction of bridges within Caltrans’ right-of-way. This includes oversight of bridges constructed by other agencies within Caltrans right-of-way or by other agreement outside Caltrans right-of-way.

**US EPA; United State Environmental Protection Agency** – The mission of the EPA is to protect human health and the environment.

**ESA** – Environmentally Sensitive Area as designated on the project plans and prominently identified on the project site to protect environmental and cultural resources.

**NESHAP** – National Emission Standards for Hazardous Air Pollutants

**Protective Cover** – Shielding installed between bridge removal work and any resource, utility, or public area to be safeguarded or preserved.

**SC** – Structure Construction. This is the subdivision within Caltrans DES responsible for the administration of bridge (and other structures) construction contracts within Caltrans' right-of-way or oversight thereof.

**Silica** – Naturally occurring mineral found in aggregates used to produce concrete; silica crystals are present in granite. Quartz is the most common form of crystalline silica and is the second most common mineral on the surface of the earth. Silica is commonly found in nature as sand. Silica becomes a hazard when the dust is airborne. Cal/OSHA's silica requirements can be found under Title 8, § 1532.3, of the California Code of Regulations.

**Standard Specifications** – Whenever the term "*Standard Specifications*" is used in this manual, it refers to the current edition of the *Standard Specifications* issued by the California Department of Transportation.

**Temporary Bracing** – Short term structural support, primarily to resist lateral forces. Bracing should be designed and constructed to resist actual horizontal forces and the minimum contractually specified horizontal forces.

**Temporary Support** – Short term structural support to an existing structure or structural element during bridge removal work. Used to control the bridge removal sequence or sometimes to support the entire bridge during jacking operations.

**Traffic Opening** – Provisions for the passage of public traffic through temporary works, including minimum clearances, impact resistant elements, and lighting.

**USCG; Department of Homeland Security United States Coast Guard** – Regulates structures over navigable waters. Any repairs, relocation, reconstruction, additions, or modifications to a bridge that will change any of the information shown on the plans (permit drawings) attached to the Federal Bridge Permit are considered an alteration of the bridge and require prior approval of the USCG.