Chapter 4-14: Conveying Equipment

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4-14.01 General

4-14.01A Work Included

This chapter includes conveying equipment that will be furnished by the Contractor. The equipment will include mobile vehicle lifts, vertical reciprocating conveyors, bridge cranes and hoists, free-standing bridge cranes and hoists, jib cranes, dock levelers, bumpers, and such other similar equipment. Also listed will be the four-post mobile vehicle lifts used in the mechanic's buildings and the retractable pit covers used in truck and agriculture inspection stations.

4-14.01B Tips and Suggestions to Prepare for Inspection of Conveying Equipment

1. The authorized submittals for the bridge and jib cranes will contain specific information needed to inspect these items.
2. If anchor bolts are to be set to mount equipment, a template will be needed for the setting of the bolts. It is critical that the location of the anchor bolts be set very carefully.
3. Equipment that is installed adjacent to the bridge crane will require a specific review to ensure that the clearances provided for in the project plans and the authorized submittals are maintained. The equipment and components that may be adjacent to the bridge crane include the trolley and bridge, end stops, electrical connections, and the interface with radiant heating systems.
4. There are special requirements for testing and inspection that are included in the project *Special Provisions*. Some of the testing included are the safe lift of overloads, secure stop and fail-safe of loads in transit (both vertically and horizontally), and the timing and travel to stop for the bridge. Verify the testing requirements for each project.

Review any Standard Special Provisions (SSPs) from Section 99[1], *Building Construction*, Division 14, *Conveying Equipment,* that have been included in the project *Special Provisions*, since much of the information therein typically will not be repeated in the following sections of this chapter.

4-14.02 Mobile Vehicle Lift

This work consists of furnishing and testing of a mobile vehicle lift and providing training to the end user. This normally includes four individual post lifts which can be moved

[1] Caltrans internal use only

around the floor surface to accommodate the lifting of any axle combination; see Figure 4-14.1 for an illustration. Follow the *Special Provisions* and authorized submittals. The training is for the final user of the product, so coordination will be necessary between the Contractor and the end user.



Figure 4-14.1. Mobile Vehicle Lifts

4-14.03 Vertical Reciprocating Conveyor

Reserved

4-14.04 Bridge Crane and Hoist

This work consists of designing, furnishing, constructing, installing, testing, and training on the use of a bridge crane with an electric-powered hoist on a motorized trolley. The work also includes design, construction, and installation of the crane runway rails. Individual parts of the bridge crane and hoist may be manufactured by separate companies. Check the authorized submittals to ensure that all parts and pieces are provided. Any parts that were included in the authorized submittal but not delivered should be brought to the attention of the Contractor.

The bridge crane and hoist can be designed as a free-standing unit, as illustrated in Figure 4-14.2. However, in some instances the bridge crane and hoist may be designed to be carried by the primary structural framing members of the building they are housed in. The main building frames may also be designed to carry the bridge crane and hoist in conventional structural steel frame designs.

Confirm the required power supply is available and verify power runs for the bridge crane are not installed near radiant heaters and other heat sources; this will require coordination with prime and electrical contractors ahead of time.



Figure 4-14.2. Free-standing Bridge Crane

4-14.05 Retractable Pit Covers

This work consists of furnishing, testing, and training on retractable pit covers. The inspection pits are normally furnished at California Highway Patrol truck inspection facilities for inspection underneath trucks and trailers. The retractable pit cover is the portion shown below in Figure 4-14.3 with the expandable metal mesh. These are usually square sections with wheels that run on a steel angle track mounted on a wall ledger and connected together with a 50 percent split on the length of the track, which will move in opposite directions. The function is similar to a garage door, with the remote sending power to the unit from a button at the control station that operates the covers. The audible and visual alarms activate when the cover is moving.

The vertical steel plates (WT – structural tee sections) shown in the picture below (Figure 4-14.4) are wheel guides for the truck/trailer tires, and the distance between the wheel guides will need to be accurately checked. The average distance between the interior tires for a set of doubles is 47 inches for a semi-truck. Safety paint is applied over the retractable pit cover and the area around the inspection pit to prevent personnel from walking on the pit cover or falling into the pit area.

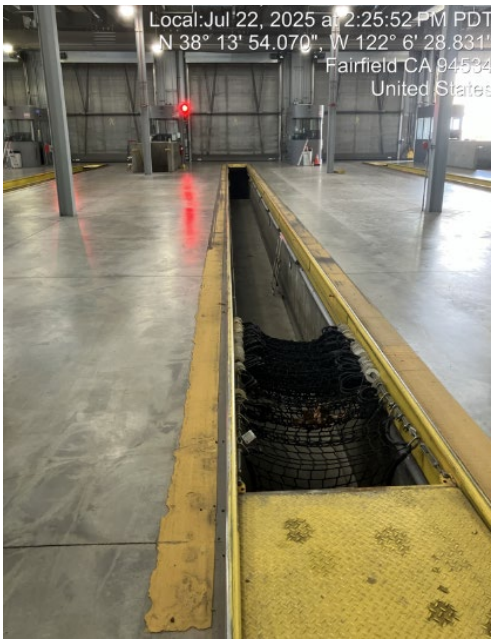


Figure 4-14.3. Older Style Inspection Pit



Figure 4-14.4. Close-up View of WT Used as Wheel Guides for Truck/Trailer Tires

The steel cover plate shown below is the cover for the pit trench, which extends beyond the building's exterior wall so the pit cover can move out when open and retract when the open pit area needs to be covered. The exterior pit trench area is not watertight, so drainage details need to be considered. Modern-day inspection pits may not extend past the exterior wall. Confirm in the contract plans and specifications for the location of pit trenches and types of retractable pit covers. See Figure 4-14.5 for an illustration of a pit trench extending outside.

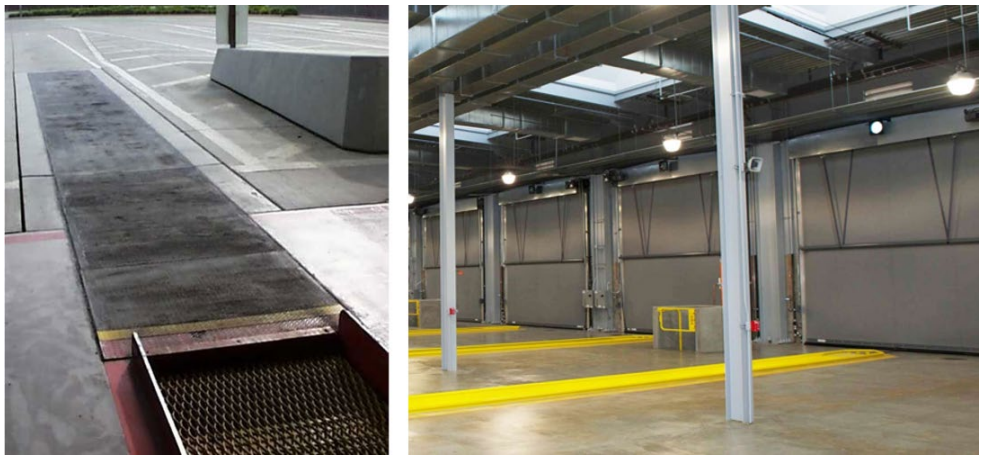


Figure 4-14.5. Pit Trench Extended Outside of Inspection Bay (Left) and Pit Trench and Retractable Cover Inside Inspection Bay (Right)

At the beginning of the project, confirm the layout of the retractable pit cover such that an open pit does not interfere with foot traffic.

4-14.06 Dock Levelers

These are simply sealed mechanisms to be built into the loading dock, which allow for adjustment of a ramp up or down to transition from the fixed level of the loading dock to the level of the truck bed backed up to be loaded or unloaded. These units are designed as slip-in units to be installed after the concrete has been completed and the building erected; they are finished items. See Figure 4-14.6 for an illustration of a dock leveler.

It is critical to have the submittals for the dock levelers authorized prior to the forming and pouring of the concrete to be used for the dock levelers. This is important because the requirements for the openings to be formed for the dock levelers are found within these authorized submittals.

The authorized submittals will have the requirements for proper placement and anchorage of the ramps.

Although mechanically assisted ramps are available, the typical unit specified by the *Special Provisions* will normally be manually (spring loaded/counterweight) operated lifts.



Figure 4-14.6. Dock Levelers at Caltrans Translab in Sacramento