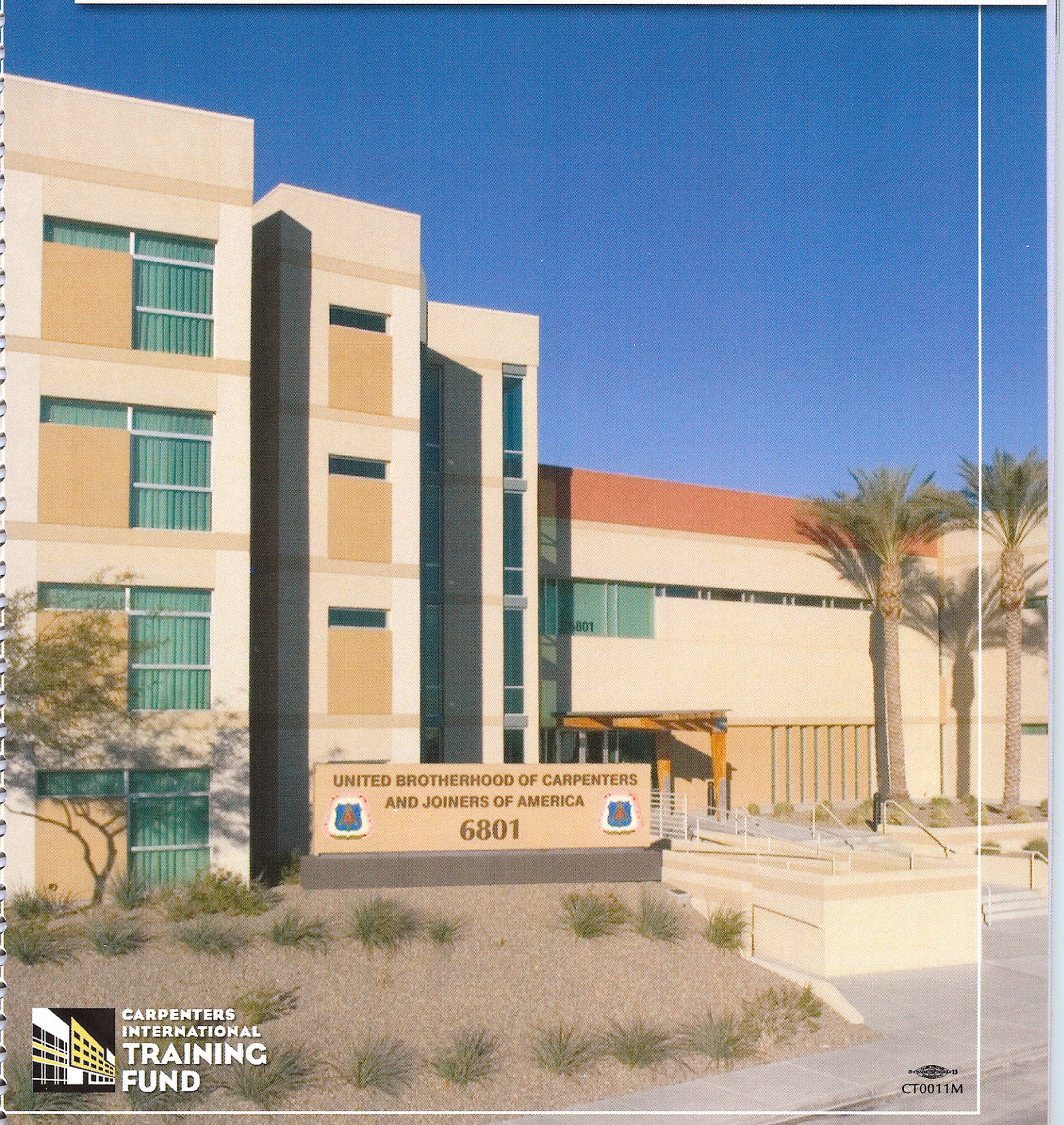
Tilt-up Construction



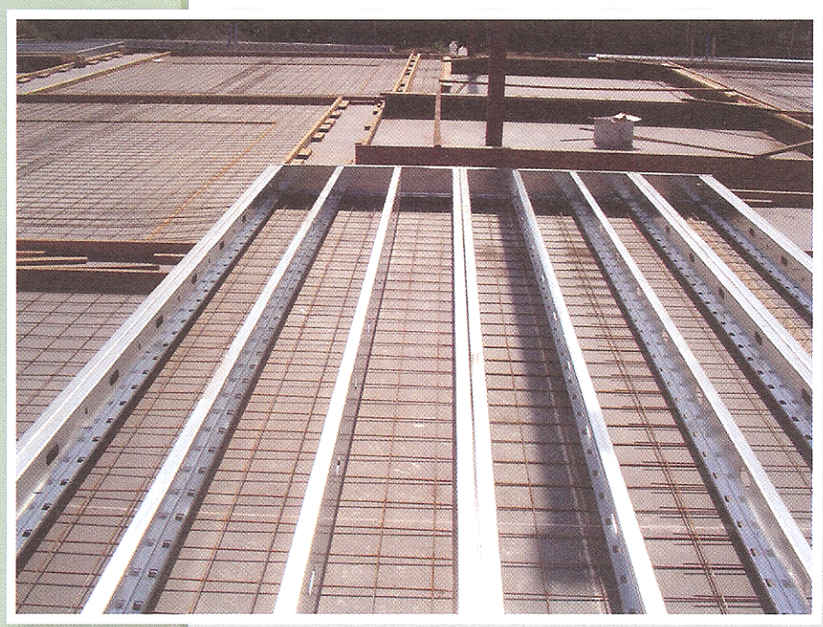
CARPENTERS INTERNATIONAL TRAINING FUND

CT0011M

CHAPTER 1

Introduction to Tilt-Up Construction

CONTENTS



Self Check

1. What is tilt-up construction?
2. In tilt-up construction, how are panels erected?
3. What is cast-in-place concrete?
4. What is precast concrete?
5. List five advantages of tilt-up construction.

3 Types of Casting Surfaces

The most commonly used types of casting surfaces include the following:

- casting slabs
- casting beds
- stack casting

Casting Slabs

Generally, tilt-up panels are cast on a **casting slab**, the concrete floor of the building to be constructed. Floor slabs not only function as an ideal casting base for the panels, but also as a platform for construction equipment. Figure 4 shows a floor slab that will serve as a casting surface for tilt-up wall panels.

The use of an automatic or laser level helps establish the correct grade for the casting slab and ensures a level surface. An automatic level requires a minimum of two people for elevation readings, one on the instrument and the other holding the grade rod. On the other hand, once a laser level is set up, one person can take elevation readings without assistance.

SAFETY TIP

Do not to look directly into a laser beam. Although lasers are safe to use, any exposure to the bright light may cause the same effect to the eyes as looking directly at the sun.

FIGURE 4
Slab used as casting surface

As with any other construction project, the base or foundation of the building is one of the most important aspects of the construction process. Just as a footing is the support for a building, the casting slab will have to support a variety of loads, ranging from the weight of tilt-up panel to the crane and the loads it has to lift. Therefore, it is imperative to start with a level slab capable of supporting the loads that will be placed on it.

To ensure well-designed foundations and floor slabs, do the following:

- Determine the function of the floor and what loads will be on it during its life.
- Make sure the sub-base is level and properly compacted. (A **sub-base** is the surface, usually aggregate or compacted soil, on which a concrete slab is placed.)
- The slab should be at least 6″ thick. Larger aggregate sizes are more economical and will minimize shrinkage.
- The minimum strength of the concrete to be placed should be 2,500 pounds per square inch (psi), although greater strengths are usually specified to obtain at least 3,500 psi in 28 days.
- The deflection tolerance of the slab's surface should be within ¼″ over a 10′-0″ span.

If pipes or other utilities will extend up through the casting slab, they should be stopped below the surface and the openings temporarily capped in order to maintain a smooth, level surface.

Casting Beds

When the concrete floor of the building is not adequate to form up all the walls, a casting bed can be used. A **casting bed** is a temporary concrete slab or a system of forms and supports for producing site-cast concrete members. Casting beds may be formed out of concrete, wood, metal, or plastic. The surface of a casting slab or bed must be smooth, level, and free from defects. They must be rigid enough to prevent *deflection* from the weight of the concrete. See Figure 5.

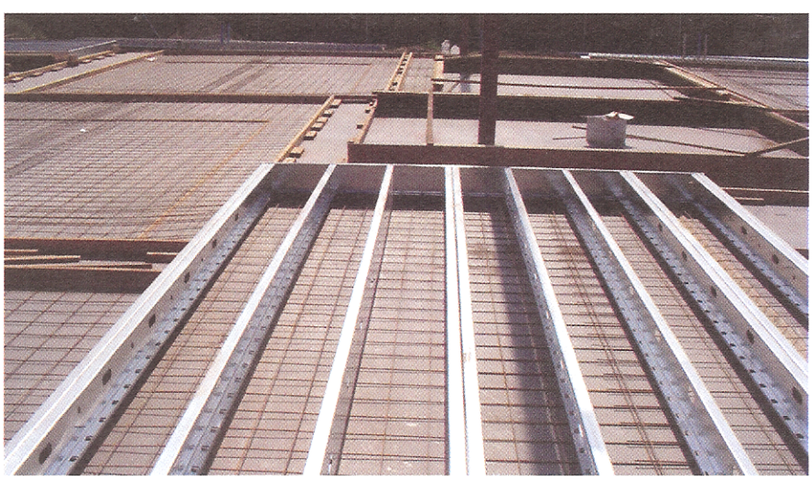


FIGURE 5
Casting bed