

## PRECAST CONCRETE PRODUCTION

Precast concrete products are produced to precise industry standards in quality-controlled environments at PCI Certified Plants. To become PCI Certified, plants must demonstrate they have appropriate experience and training in producing precast concrete, quality systems and procedures in place, and a commitment to quality throughout their organization.



The first step in the production process is to prepare concrete mix-designs in accordance with project specifications. The mixture proportioning must include strength, durability, slump, workability, and maximum allowable water/cement material ratio project requirements. The mix-design determines chemical admixture types and dosages.

Casting forms or beds for structural products are generally long-line steel and for architectural products are generally epoxy-coated wood or 3-D printed carbon-fiber molds. All form casting surfaces are thoroughly cleaned, and a form release agent is uniformly applied prior to placement of steel reinforcement. Side rails are often drafted for ease of product stripping.

Concrete is transported from the batch plant mixer to the forms and cast in the shortest possible time to prevent any segregation of aggregates and loss of mortar. Concrete is placed uniformly and consolidated by using internal or external vibration.

Quality control personnel are employed to ensure that proper methods for all phases of production are being followed and that all finished products comply with approved production drawings and project specifications. Before casting any concrete, a pre-pour inspection of the form is conducted. Concrete test specimens are made for performing slump, air content, and compressive strength testing.

After casting is completed, all top open-faced concrete surfaces are finished with vibrating screeds, wood or magnesium floats, or steel trowels as indicated on production drawings. Concrete temperatures are monitored throughout the curing process. Accelerated curing is accomplished with live-steam or radiant heat.

Insulated curing covers or blankets are used to ensure proper moisture and heat retention.

Curing will continue until the stripping strengths specified on production drawings have been achieved. Curing covers are then removed and finished products are stripped from the forms. Products are then cleaned and inspected prior to yarding. After inspection, the finished products are taken to the storage yard for final curing where they are stored in a required erection sequence for eventual just-in-time delivery to the jobsite.

