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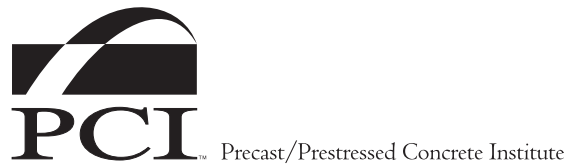
Erector's Manual

Standards and Guidelines for the Erection of Precast Concrete Products



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ERECTORS' MANUAL

STANDARDS AND GUIDELINES FOR THE ERECTION OF PRECAST CONCRETE PRODUCTS

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While every effort has been made to prepare this publication as the national standard for the industry, it is possible that there may be some conflicts between the material herein and local practices.

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ERECTORS' MANUAL

Standards and Guidelines

for the Erection of Precast Concrete Products

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INTRODUCTION

This manual is intended to provide **Standards** and corresponding guidelines for the erection of plant-produced precast and prestressed concrete products, and to establish a level of quality that will be recognized and respected by the construction industry.

The development and formatting of this manual has been guided by the PCI Plant Certification Program to allow this document and the PCI manual, "Erection Safety for Precast and Prestressed Concrete" (MNL-132) to be the primary source documents for the implementation of a quality assurance program for erectors. This manual is intended to describe a set of satisfactory quality control procedures for a general precast concrete erection operation. It should be augmented as required for specific operations and products by the specifier or erector.

This manual includes **Standards** shown in boldface type. These are the important fundamental requirements governing the quality of installed precast and prestressed concrete elements. The remainder of the manual is the Commentary which amplifies and explains the **Standards**. The Commentary also provides many suggestions regarding how to perform various erection operations.

Tolerances provided are industry tolerances developed by the PCI Tolerance Committee. These tolerances were developed with extensive input from designers, precasters and erectors.

A successful precast concrete project requires teamwork. This means close cooperation and coordination of all participants including the owner, architect, engineer, precaster, erector, general contractor and/or construction manager (GC/CM), and all other affected trades. The basic working relationship between these parties must be established at an early stage in the development of a project in order to achieve the desired schedule and results. Each of these parties has the responsibility for communicating with the other parties through the GC/CM in order to achieve the best efficiency during construction and to provide a timely completed quality structure.

Quality procedures during erection are essential. The work of the precast concrete erector results in one of the most visible elements of a construction project. Even though the quality of the precast concrete components delivered to the jobsite may be outstanding, the success of the entire project is finally dependent upon the quality of

workmanship by the erector. A poorly erected project can detract not only from the performance of the structure, but also from the appearance of even the best designed precast concrete structure. The erector should assist the GC/CM in taking the lead on a construction site to help solve problems before they occur through the coordination of work of all relevant participants. Foresight and planning will help keep the project moving on a trouble-free course.

It is also very important that the erector, whether working directly for the precaster or not, recognizes that they are an "ambassador" for the precaster as well as the precast industry as a whole. The erector has more inter-relationship with the "customer" than anyone else representing the precaster, and should therefore deal with the construction team in a tactful and professional manner to help bring the project to a successful conclusion.

The contractual responsibility for the erection of precast concrete may be established through one of the following methods:

1. The precaster supplies the product erected, either by in-house labor or through an independent erector.
2. Erection is accomplished by either the GC/CM or by an independent erector under a separate agreement with the GC/CM and/or owner. The precaster is responsible only for supplying the product, **Q.C.P.**, plant or jobsite.
3. The products are purchased by an independent erector who enters into a contract with the GC/CM and/or owner to furnish and erect the complete precast concrete structure.

On projects where the precaster does not have the contractual obligation for the erection, it is very important that they assign a representative to observe, coordinate and report on erection activity. Regardless of contractual obligations, it is recommended that the precaster maintain sufficient contact with the firm(s) responsible for both transportation and erection to ensure that the precast concrete units are timely delivered, properly handled and erected according to the design and project specifications and this manual. Erection of architectural and structural precast concrete should be performed only by qualified erectors employing workers who are properly trained to safely handle and install the product.

DIVISION 1 — PRECONSTRUCTION PLANNING

1.1 Purpose

The probability for success in a construction project begins well before any work has started at the site. One of the most important steps in a project is preconstruction planning. It is an activity that is very often overlooked. It is at this stage that the “seeds” are planted for success or failure.

Preconstruction planning implies “building the job in your mind” and anticipating as many factors as possible that could affect the work. There is no substitute for experience in predicting jobsite difficulties or constraints; however, the purpose of this section is to guide the precaster and/or erector in areas that should be considered and addressed. The areas of concern that should be addressed during preconstruction planning are:

1. Determining site access, erection direction and sequencing.
2. Identifying hazards.
3. Determining size and weight limitations.
4. Erection planning.
5. Equipment selection.
6. Developing an erection safety plan.
7. Field layout and verification.
8. Special handling requirements.
9. Special lifting hardware.

This order indicates the usual sequence of activities but many factors occur that influence project planning. Each step is further considered in this chapter.

1.1.1 Responsibility of the General Contractor

The general contractor or construction manager (GC/CM) is normally responsible for project schedule, grid dimensions, and coordination with all construction trades. Relative to erection of precast concrete, the GC/CM in conjunction with the precaster should:

1. Be responsible for coordinating information necessary to produce the precast concrete erection draw-

ings. A preconstruction conference should be held as soon as possible after award of the precast concrete contract. This meeting should consider all details covered in this section, including jobsite access, erection sequencing, weight/size limitations, special rigging and guy/bracing scheme information. The sequencing and guying/bracing information should be communicated to the precast engineer. If necessary, the precast engineer would then develop, in conjunction with the erector and engineer of record, a bracing sequence to maintain stability of the structure during erection. Limitations may state, for example, that loading of the structure be balanced, requiring that no elevation be erected more than a stated number of levels ahead of the remaining elevations. Other limitations may involve the rigidity of the structure, requiring that walls not be erected prior to completion of floors designed to carry the lateral loads.

For steel frames, it should be determined how far in advance the final connections of the frame are to be completed prior to panel erection. Particular consideration should be given to deflection and/or rotation of the supporting steel members due to the precast concrete and other superimposed loads. For concrete frames, the GC/GM should furnish to the erector, strength of concrete and authorization to begin erection.

The engineer of record should also recognize that connections between panel and frame impose concentrated loads on the frame and that these loads may require supplemental reinforcement. In the case of multi-story concrete frames, consideration should be given to the effects of frame shortening due to shrinkage and creep.

2. Review and approve (or obtain approval) for all erection drawings and related design.
3. Be responsible for the coordination of dimensional interface between precast concrete and the work of other trades.
4. See that proper tolerances are maintained by other trades to guarantee accurate fit and overall conformity with precast erection drawings.