Marina City - The History and Restoration of an Iconic Facade

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Abstract

The twin towers of Marina City were the tallest reinforced concrete buildings in the world when they were completed in 1962. The design and construction of Marina City was an important milestone during the evolution of concrete high-rise construction during the 20th century, and the unique modern design served as a model for mixed-use developments that is still used today. The construction of the towers utilized innovative design and construction techniques. Significant concrete deterioration was identified on the facade in the 1990's which presented challenges associated with performing concrete repairs on high-rise buildings. This paper reviews the history of the design, construction and restoration of these iconic towers.

Keywords: high-rise buildings; reinforced concrete; facade; concrete repairs.

1 Design

Marina City in Chicago was designed by Bertrand Goldberg Associates. Twin high-rise towers are part of a mixed-use complex that consists of five distinct structures including the towers, a 10 story office building, and a theater building. Described as "the City within the City", the complex originally included residences on the upper portion of the towers, a parking garage on the lower floors of the towers, an office building, a marina, a theatre, an ice skating rink, a bowling alley, restaurants, and retail. This mixed-use format of residential, office, and retail with parking below is the model still used today for urban developments.

The towers are 63 stories tall (178 m) and were the tallest reinforced concrete buildings in the world when they were completed. The circular design utilizes an innovative center core surrounded by two concentric rings of columns. Radial floor beams extend from the core to the exterior columns. Curved cantilevered balconies extend out from each column. Lightweight concrete was used for the beams and floors.

Figure 1. Overall view of towers.

2 Construction

Construction began in 1960, and was completed in 1963 and 1964. The foundation consists of reinforced concrete caissons drilled to a depth of

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