

# National City Marine Terminal, Port of San Diego - Crane Rail Beams System



## Owner

Port of San Diego

## Client

Utility Vault division of  
Oldcastle Precast inc.

## Location

San Diego, California

## Project Components

- Precast concrete
- Durability analysis
- Service life predictions
- Remediation methods
- Life-cycle cost analysis

## Services Provided

- Civil Engineering
- Laboratory Testing
- Service Life Modeling

## Completion Date

2003

## Client Contact

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*Crane Rail Beams System*

The mandate given to Materials Service Life, LLC was to perform a predictive durability analysis to establish the influence of concrete cover variations on the service life of precast crane rail sections at the Port of San Diego, California. More specifically, the first objective of this project was to assess the long-term durability of the concrete mixture designed by Oldcastle Precast, Inc. to produce the concrete elements recently installed at the Port of San Diego. The influence of a non-organic surface coating on the concrete element's service life was also investigated during the course of this project. Finally, the long-term durability of the concrete mixture originally specified by the Port Authority of San Diego was investigated.

## MANDATE

- Evaluate as-built beams service life expectations.
- Evaluate long-term beams' performance.
- Provide repair designs so that the beams reach the expected service life (45 years).

## MSL SOLUTION

- Numerical simulations using STADIUM® allowed MSL to evaluate the beams service life expectation based on the chloride exposure conditions and on concrete transport properties.
- Recommendations had to consider chloride exposure conditions.
- Using STADIUM®, service life expectations of the beams were compared for each remediation methods proposed by MSL and the client.
- Solutions proposed by MSL turned out to be the most efficient and the most durable.