Rehabilitation of RCC Jetty
Gopalpur Port, Orissa
A Case Study
Rehabilitation of RCC Jetty

Project
The RCC Jetty at Gopalpur Port, Orissa, with a total length of 445 m is used to unload cargo by barge. The structure consists of piles, RCC beams and a RCC slab. All elements of the structure showed severe distress due to rebar corrosion as a consequence of chloride ingress up to and beyond the depth of the steel rebars. The same was further facilitated by a moderately dense concrete, an abundant number of concreting joints and no proper maintenance since the commissioning of the structure.

Project Requirements
The structural safety of the structure was no longer fully assured due to the corrosion related loss of effective rebar cross section. The rehabilitation project had to insure that the structural safety of the entire structure is restored and that the structure is well protected against the aggressive sea water environment for the next life cycle. The rough sea, a tight three month timeframe for execution of works and the fact that the Jetty was in normal use during the works caused additional challenges.

Sika Solution
After an in-depth inspection and assessment of the structure Sika proposed to the owner, Gopalpur Port Limited, an integral rehabilitation solution consisting of the following steps:
1. Initial condition survey; non destructive testing and visual inspection by IIT Chennai, Department of Oceanography;
2. Surface preparation to remove of all loose / unsound concrete;
3. Replacement of excessively corroded rebars; Sika Refix anchoring mortar;
4. Application of protective coating on the rebars; Sika Friazinc R, a zinc rich epoxy coating;
5. Drilling of core holes through the top slab to serve as inlet / outlet points for the micro-concrete;
6. Installation of watertight shuttering from the underside with the help of the hanging platform;
7. Placement of micro-concrete using positive displacement pumps; SikaRep Microcrete-3 UW, suitable for wet / moist conditions, admixed with Sika Ferrogard-901, a corrosion inhibitor;
8. Application of full surface protective coating; Inertol Poxitar, a heavy duty protective coating;

1.) Initial Condition Survey

Full view of underside of Jetty  
Detailed view of underside of Jetty
2.) Surface Preparation

Installation of a temporary hanging truss as working platform to access the underside of the jetty.

Removal of loose concrete using a chisel …

…and a power driven chisel hammer.

Sandblasting operation in progress.

3.) Replacement of corroded rebars

Drilling of holes to fix additional stirrups

4.) Application of protective coating

Protective coating applied on rebars
5.) Drilling of core holes
Holes to fill in micro-concrete from the topside

6.) Installation of shuttering
Part-shuttering for the beam installed

7.) Application Micro-Concrete
Detail refurbished slab
Detail refurbished beam

8.) Full surface protective coating
Detail refurbished pile cap
Application of full surface protective coating