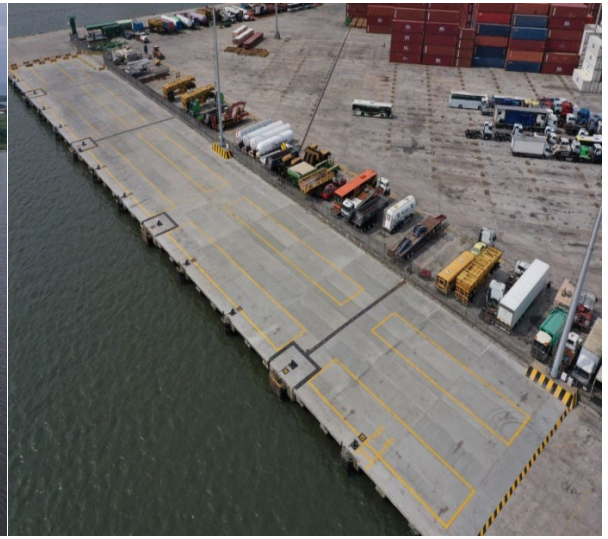
REF A15 SLAB STRENGTHENING (CONCRETE OVERLAY) OF DOCK PLATFORM

PROJECT	Tin Can Island Port (TCIP), Nigeria
LOCATION	Lagos Harbor, Apapa, Nigeria
CONTRACTOR	Grimaldi Lines
ENGINEER	Team Engineering
IMPLEMENTATION	2024



Applications Slab strengthening (concrete overlay)

Design EOTA TR 066 & EC2-4

Hardware HIT-RE 500, Drilling tool TE-6, HDE 500

Software PROFIS Engineering (Concrete-to-Concrete)

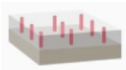
Services Trainings to the design team, On-Site Testings

CHALLENGES

- Local requirement of shear-connectors HCC-K
- Design of shear-friction application with locally sourced shear-connectors

HILTI TOTAL SOLUTION

- ✓ Support in specifications for local sourcing of shear-connector product
- ✓ Design using PROFIS Engineering paired up with expert engineering judgement



LOAD / CONDITIONS: Static / Less embedment depth

PROJECT HIGHLIGHT Strengthening of port dock platform with locally sourced connectors anchored using HIT-RE 500

PROBLEM STATEMENT AND OBJECTIVES

Tin Can Island Port (TCIP) is located in Apapa and it is the port for the city of Lagos. The port is about seven kilometers west of the center of Lagos across the Lagos Harbor. It is the second busiest Port in Nigeria.

Requirement to strengthen a portion of the existing concrete platform of the port demanded the upgrading of the concrete resistance of the new structure, which will allow cruise ship mooring at the quay. Hence, **the project objective was to have a code compliant and optimized design for shear-friction overlay concrete over the existing platform** (slab strengthening application), and easier installation of the same within the time constraints

DESIGN APPROACH

Several design solutions for the **concrete overlay of 15 cm** were considered to facilitate comparisons in terms of installation time, cost, and procurement of materials in alignment with local needs and time constrain:

1. HUS-4 screw anchor connectors
2. Hooked rebars anchored with RE 500 V4
3. HCC-K connectors anchored with RE 500 V4

Final choice was the design solution with chemical anchor HIT RE 500 V4 directly shipped to the jobsite from the main contractor and rebars very similar to HCC-K which were needed to be adapted and produced by local manufacturers for the required installation anchoring length.

SOLUTION AND FINAL OUTCOME

HILTI has been in consistent touch with the design team for design assistance and to bringing design efficiencies using EOTA TR066 for the concrete overlay and providing a comparative calculation with different solutions.

Slab strengthening – EOTA TR 066 & EC2-4 design method was used for shear-friction overlay application. Also, Hilti Method for the overlay with hooked bars was used for solution comparison.

A total solution was specified with all necessary equipment to facilitate easy and efficient installation of the overlay, thus reducing the probability of errors and assuring the dock resistance as intended by design – **'Perfect Set'**

Application: Slab strengthening

Application: Slab strengthening

Design & Installation