



PROJECT PORTFOLIO - POST-TENSIONING SYSTEMS

Golden Pass LNG Terminal Storage Tanks

Sabine Pass, Texas



SDI's POST-TENSIONING WORK FOR THE GOLDEN PASS LNG TERMINAL PROJECT WAS SUCCESSFULLY EXECUTED WHILE WORKING UNDER AN EXTREMELY DEMANDING FAST-TRACK SCHEDULE AND THE NEED TO DESIGN AND PERFORM A COMPREHENSIVE CRYOGENIC TESTING PROGRAM TO QUALIFY THE POST-TENSIONING SYSTEM. SDI ALSO PERFORMED SITE CLEANUP AND RECOVERY WORK AFTER A CATEGORY 4 HURRICANE DEVASTATED THE AREA WITH STORM SURGES AND HIGH WINDS.



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SDI was awarded a subcontract by Baker Concrete Construction, Inc. (BCCI) in December 2006 for supply and installation of the post-tensioning system for five LNG tank structures at the Golden Pass LNG (GPLNG) Terminal Project in Sabine Pass, TX. BCCI's role for the Project is Concrete Subcontractor to Chicago Bridge & Iron (CB&I) which is the Prime Contractor to GPLNG's Owner, led by Exxon Mobil.

At time of contract execution both SDI and BCCI were held to a very tight project implementation schedule for the fast-track project. In addition, as this was the first LNG project incorporating SDI post-tensioning (PT) hardware, SDI was contractually required to perform cryogenic testing to qualify the SDI PT system for Project use. SDI promptly established a mono-strand testing program to qualify the strand supplier's product and a multi-strand testing program to qualify the anchorage system and anchorage zone reinforcement. Formal cryogenic testing at temperatures below -168°C (-270°F) was successfully performed at SDI's San Jose facility during the period May 15-17, 2007 witnessed by BCCI, CB&I and Exxon-Mobil representatives. As a result of test results achieved by SDI the Project team was permitted to use standard Grade 60 reinforcement in place of cryogenically qualified reinforcement for the buttress anchorage zone, reducing both the cost and lead-time for material procurement.

Construction of the tank structures commenced in April 2007. During tank base slab and wall construction SDI supported BCCI for duct, loop and anchorage hardware installation. During the wall construction period, SDI prepared a prefabrication yard and commenced with prefabrication of the vertical tendons, executed full-scale grouting mock-up tests, and proceeded with setup of access platforms for the first two tanks.

Once the final wall lift was poured for each tank, SDI expedited installation of the wall vertical and ring beam tendons as completion of this work was the primary constraint for concrete placement for the tank roof. Vertical "U" tendons prefabricated at the on-site fabrication were hoisted and installed from the ring beam. Ring beam tendons were installed from the ring beam formwork. After dome concrete placement, SDI installed the horizontal wall tendons from access platforms installed at each of the four buttresses.

The Project was progressing very well through September 12-13, 2008 when Hurricane Ike, a Category 4 event, caused significant damage to the Project site due to extreme winds and a devastating storm surge that left the site flooded with over six feet of sea water. After site access was eventually regained, SDI supported the Project Team and Owner for: evaluation of impact; preparation of recovery plans and procedures; clean-up of affected work areas and salvageable equipment & materials; replacement of damaged equipment & materials; on-site testing, evaluation & reporting functions; and, restoration of full production capacity to support completion of the remaining construction work at site.

With SDI's support the initial phase of tank construction and post-tensioning was successfully completed for the five tanks in June 2009. The final phase of post-tensioning, which is installed after the temporary construction opening closures are completed, is forecasted for completion by July 2010 for the initial three tanks and October 2010 for the remaining two tanks.

