OFFICE OF THE SPECIAL INSPECTOR GENERAL FOR IRAQ RECONSTRUCTION

ROLL-ON/ROLL-OFF BERTH
PORT OF UMM QASR, IRAQ

SUSTAINMENT ASSESSMENT

SIGIR PA-08-162
JULY 8, 2009

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
08 JUL 2009		**00-00-2009 to 00-00-2009**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Roll-On/Roll-Off Berth Port of Umm Qasr, Iraq. Sustainment Assessment	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **Office of the Special Inspector General for Iraq Reconstruction,400 Army-Navy Drive,Arlington,VA,22202-4704**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT **unclassified**	b. ABSTRACT **unclassified**	c. THIS PAGE **unclassified**	**Same as Report (SAR)**	**32**	

SIGIR

Special Inspector General for IRAQ Reconstruction

July 8, 2009

Summary of Report: PA-08-162

Why SIGIR Did this Study

SIGIR is charged to conduct assessments of Iraq reconstruction projects funded with amounts appropriated or made available by the U.S. Congress. SIGIR assessed this project to provide real-time information on relief and reconstruction to interested parties to enable appropriate action, when warranted.

The objective of this sustainment assessment was to determine whether the project is operating at the capacity stated in the original contract. To accomplish the objective, SIGIR determined whether the project was at full capability or capacity when accepted by the U.S. government, when transferred to Iraqi operators, and during the site inspection.

What SIGIR Recommends

To ensure the continued operation of the Umm Qasr Roll-On/Roll-Off Berth, SIGIR recommends that the U.S. Embassy Transportation Attaché communicate to the Iraqi Ministry of Transportation the need to repair or replace:

1. The pontoon guide rail and roller assemblies
2. The hinges that connect the steel structure decking and the pontoon decking
3. Two rubber fenders on the berthing dolphins

The U.S. Embassy Transportation Attaché verbally confirmed that the Iraqi Ministry of Transportation and Port of Umm Qasr officials had been informed of the needed repairs at Roll-On/Roll-Off Berth 22 and that his office would continue its on-going coordination actions with the Iraqi Ministry of Transportation and Port of Umm Qasr officials to locate funding for the needed repairs.

For more information, contact SIGIR Public Affairs at (703) 428-1100 or PublicAffairs@sigir.mil

Roll-On/Roll-Off Berth

What SIGIR Found

On 6 January 2009, SIGIR performed an on-site assessment of the Roll-On/Roll-Off Berth project at the North Port of Umm Qasr, Iraq. This $2.7 million project was funded by the Iraq Relief and Reconstruction Fund. Because of security concerns, the total time available on site was approximately 45 minutes; therefore, an in-depth review was not possible.

Although SIGIR could not inspect the underwater requirements, SIGIR inspected the steel deck structure and abutment, pontoon and pontoon decking, guide rail/roller assemblies, mooring and berthing dolphins, the steel walkway to the dolphins, and the adjacent parking and sidewalk area.

On 17 December 2005, Gulf Region South of the U. S. Army Corps of Engineers awarded the contract and was responsible for oversight of the project's construction. The objective of the project was to increase the operational efficiency and capacity of the Port of Umm Qasr. The project would allow additional vessels to dock at the Port of Umm Qasr, which would increase the amount of imports and exports flowing through the port and reduce the time for loading and unloading freight. The project would also result in an increase in local employment.

SIGIR reviewed the contractor's 90% design package. The contract required 60% and 90% designs, but only the 90% drawings were located. After reviewing the 90% drawings, SIGIR determined that the project was adequately designed and the initial construction was satisfactory.

During the on-site inspection SIGIR identified damage to the pontoon guide rail/roller assemblies, damage to the hinges that connect the steel structure decking and the pontoon decking, and two rubber fenders that need to be replaced on the berthing dolphins. The specific cause of the damage could not be determined; however, Gulf Region South personnel stated that the damage was caused by careless/rough operations by port personnel and lack of routine maintenance by the Government of Iraq.

SIGIR concluded that the construction of the Roll-On/Roll-Off Berth facility was adequate; aside from the minor damage noted, the project was operating at the capacity provided for in the contract. Local port security documentation showed that the Roll-On/Roll-Off Berth had been operational for approximately two years. Therefore, the construction of the Roll-On/Roll-Off Berth increased the efficiency and capacity of the Port of Umm Qasr.

SPECIAL INSPECTOR GENERAL FOR IRAQ RECONSTRUCTION

July 8, 2009

MEMORANDUM FOR COMMANDING GENERAL, UNITED STATES CENTRAL COMMAND
COMMANDING GENERAL, MULTI-NATIONAL FORCE-IRAQ
COMMANDING GENERAL, GULF REGION DIVISION, U.S. ARMY CORPS OF ENGINEERS
COMMANDING GENERAL, JOINT CONTRACTING COMMAND-IRAQ/AFGHANISTAN
DIRECTOR, IRAQ TRANSITION ASSISTANCE OFFICE

SUBJECT: Report on Roll-On/Roll-Off Berth, Port of Umm Qasr, Iraq (SIGIR Report Number PA-08-162)

We are providing this report for your information and use. It addresses the current status of the construction of the Roll-On/Roll-Off Berth, Port of Umm Qasr, Iraq. The assessment was made to determine whether the project was operating at the capacity stated in the original contract.

We received comments on a draft of this report from the U.S. Embassy Transportation Attaché which addressed the issues raised in the report and recommendations made as well as clarifying information provided by the Gulf Region Division of the U.S. Army Corps of Engineers. The planned actions are responsive and address the issues identified. As a result, comments to this final report are not required.

We appreciate the courtesies extended to our staff. If you have any questions please contact Mr. Brian Flynn via e-mail at brian.flynn@iraq.centcom.mil or at 240-553-0581, extension 2485. For public affairs queries concerning this report, please contact SIGIR Public Affairs at publicaffairs@sigir.mil or at 703-428-1100.

Stuart W. Bowen, Jr.
Inspector General

Special Inspector General for Iraq Reconstruction

SIGIR-PA-08-162 **July 8, 2009**

Roll-On/Roll-Off Berth
Port of Umm Qasr, Iraq

Synopsis

Introduction. The Office of the Special Inspector General for Iraq Reconstruction (SIGIR) is assessing projects funded under the Iraq Relief and Reconstruction Fund to provide real-time relief and reconstruction information to interested parties to enable appropriate action, when warranted.

Project Assessment Objective. The objective of this project assessment was to determine whether the project is operating at the capacity stated in the original contract. To accomplish the objective, SIGIR determined whether the project was at full capability or capacity when accepted by the U.S. government, when transferred to Iraqi operators, and during the site inspection on 6 January 2009. SIGIR conducted this limited scope assessment in accordance with the Quality Standards for Inspections issued by the Council of the Inspectors General on Integrity and Efficiency. The assessment team comprised an engineer/inspector and two auditors/inspectors.

Project Objective. The overall objective of the project was to construct a second Roll-On/Roll-Off Berth (RORO), known as RORO Berth 22, at the North Port of Umm Qasr, and to replace the jetty fenders[1] that enhance energy absorption[2] at Berth 5 of the South Port of Umm Qasr. Once completed, the project was to increase the operational efficiency and capacity of the Port of Umm Qasr in Iraq. Valued at approximately $2.7 million, the project will result in allowing additional vessels to dock at the Port of Umm Qasr, which will facilitate an increase in the amount of imports and exports flowing through the port while also reducing the time for loading and unloading freight. The project will also result in an increase in the local employment.

Conclusions. On 13 September 2007, a representative from the Gulf Region South (GRS)[3] Basrah Resident Office inspected the completed RORO Berth 22 project. The GRS representative did not write a final inspection report or take any photographs to document the condition of the project when accepted from the contractor. According to project file documentation, GRS closeout documentation concluded:

> *"All work required by this contract has been accomplished in a satisfactory manner and is accepted without any noted deficiencies …The Contractor…has*

[1] A jetty is a structure extending into a body of water, which protects a harbor or coastline from the effects of currents and tides. The fender portion, usually rubber, is hung over the side to protect vessels from damage caused by impact with wharves or other craft.

[2] Energy absorption is a conversion of mechanical or radiant energy into the internal potential energy or heat energy of a system.

[3] GRS is one of three districts under the United States Army Corps of Engineers (USACE) Gulf Region Division (GRD). GRD and its three districts provide construction management services and assist the Government of Iraq to maintain its own construction, operation, and maintenance program of essential services and national infrastructure.

completed all assigned work. All parties acknowledge that the work performed under the contractor meets the standards set forth in the contract scope of work."

The GRS Basrah Resident Office representative signed the Memorandum for Closeout document on 26 September 2007, certifying that all work was completed and met the standards of the contract's Statement of Work.

On 10 September 2007, prior to inspection and certification of completion, the GRS Basrah Resident Office officially turned over the RORO Berth to the Port General Manager. The contractor, a representative from the GRS Basrah Resident Office, and the Port General Manager signed a Memorandum for Record stating:

"…this document certifies that all work has been inspected, and is accepted as being in accordance with the contract requirements. Construction at this facility is complete and no other work is to be performed as part of this contract unless noted below."

On 6 January 2009, SIGIR conducted an on-site assessment of the project. During the site visit, RORO Berth 22 was not occupied, and freight was not being loaded or unloaded.

Before the site visit, SIGIR reviewed the design submittals for this project. The Statement of Work required the contractor to provide submittals at the 60% and 90% design levels, and then the final as-built design documents for RORO Berth 22 and Berth 5. SIGIR requested these submittals; GRS could not produce the 60% design drawings, but produced the 90% and as-built designs. SIGIR determined that the RORO Berth 22 and the Berth 5 jetty fenders were adequately designed.

Due to security concerns at the site, SIGIR performed only an expedited 45-minute assessment. SIGIR could not inspect the underwater requirements for the RORO Berth 22 or the jetty fenders at Berth 5; instead, SIGIR inspected these areas of RORO Berth 22:

- adjacent parking and sidewalk area
- steel deck structure and abutment
- pontoon and pontoon decking
- guide rail/roller assemblies
- mooring and berthing dolphins
- steel walkway to dolphins

SIGIR's review of design documentation, provided by GRS, determined that the initial construction of RORO Berth 22 appeared adequate. However, the site visit identified damage to the pontoon guide rail/roller assemblies; damage to the hinges that connect the steel structure decking and the pontoon decking; and two rubber fenders that need to be replaced on the berthing dolphins. The specific cause of the damage could not be determined; however, GRS personnel stated that the damage was caused by careless/rough operations by port personnel and lack of maintenance by the Government of Iraq.

SIGIR concluded that the construction of the RORO Berth facility was adequate; aside from the minor damages noted, the project was operating at the capacity provided for in the contract. At the time of the site visit, local port security documentation showed that RORO Berth 22 had been operational for approximately two years. Therefore, the construction of RORO Berth 22 had increased the efficiency and capacity of the Port of Umm Qasr.

Recommendations. To ensure the continued operation of Roll-On/Roll-Off Berth 22, SIGIR recommends that the U.S. Embassy Transportation Attaché communicate to the Iraqi Ministry of Transportation the need to repair or replace:

1. Pontoon guide rail and roller assemblies
2. Hinges that connect the steel structure decking and the pontoon decking
3. Two rubber fenders on the berthing dolphins

Management Comments. The U.S. Embassy Transportation Attaché verbally confirmed that the Iraqi Ministry of Transportation and Port of Umm Qasr officials had been informed of the needed repairs at Roll-On/Roll-Off Berth 22 and that his office would continue its on-going coordination actions with the Iraqi Ministry of Transportation and Port of Umm Qasr officials to locate funding for the needed repairs.

In addition, SIGIR received comments on the draft of this report from the Commanding General, Gulf Region Division (GRD), stating that "the report adequately addresses the Gulf Region South district office's performance on the subject contract."

Evaluation of Management Comments. SIGIR appreciates the prompt action taken by the U.S. Embassy Transportation Attaché to resolve the issues identified in this report as well as the clarifying information provided by GRD. As a result, no additional comments are required.

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Introduction

Objective of the Project Assessment

The objective of this project assessment was to provide real-time relief and reconstruction project information to interested parties to enable appropriate action to be taken, when warranted. Specifically, the Special Inspector General for Iraq Reconstruction (SIGIR) determined whether the project was operating at the capacity stated in the original contract. To accomplish this, SIGIR determined whether the project was at full capability or capacity when accepted by the U.S. government, when it was transferred to Iraqi operators, and during SIGIR's on-site inspection.

Pre-Site Assessment Background

Contract, Costs and Payments

Gulf Region South (GRS), on 17 December 2005, awarded Contract W917BK-06-C-0004, a firm-fixed-price contract in the amount of $2,690,000 to a local contractor. The contract required the contractor to complete the project within 210 calendar days from the Notice to Proceed, which the contractor signed on 7 January 2006.

There were four modifications to the base contract:

Modification P00001, dated 5 August 2006, extended the period of performance from 5 August 2006 until 13 November 2006 due to circumstances beyond the contractor's control and at no additional cost to the government.

Modification P00002, dated 14 October 2006, was not signed by either the contractor or the contracting officer. The modification extended the period of performance by 100 days from 13 November 2006 to 21 February 2007 due to delays beyond the contractor's control. The contract price remained unchanged.

Modification P0003, dated 11 February 2007, extended the period of performance by 90 days from 21 February 2007 to 22 May 2007 due to delays beyond the contractor's control. The contract price remained unchanged.

Modification P0004, dated 18 July 2007, increased the total contract cost by $44,500 to $2,734,500. The additional funds were added to exercise optional Line Item 0005 and to complete construction of the Roll-On/Roll-Off (RORO) Berth.

Project Objective and Pre-Construction Description

The overall objective of the project was to increase the operational efficiency and capacity of the Port of Umm Qasr by constructing a second RORO Berth (Berth 22) at the North Port (Figure 1 – Site 1), approximately 185 meters (m) northeast of the existing RORO berth (Berth 21), and to replace the jetty fenders to enhance the protection and energy absorption at Berth 5 of the South Port (Figure 1 – Site 2), which is approximately 250 m long. To accomplish the overall objective, the contractor was to repair the jetty fenders at Berth 5 and remove the underwater unexploded ordnance (UXO) and wreckage from Berth 21.

The description of the facility (pre-construction) is based on information that SIGIR obtained from the contract and GRS Basrah Resident Office documentation and personnel. RORO Berth 22 site is located at the Port of Umm Qasr, in the Governorate of Basrah, Iraq. The Port of Umm Qasr is north of the mouth of the Khawr Az Zubayr River, approximately 542 kilometers south of Baghdad. The Port of Umm Qasr is one of Iraq's major commercial ports and a distribution center for overseas supplies.

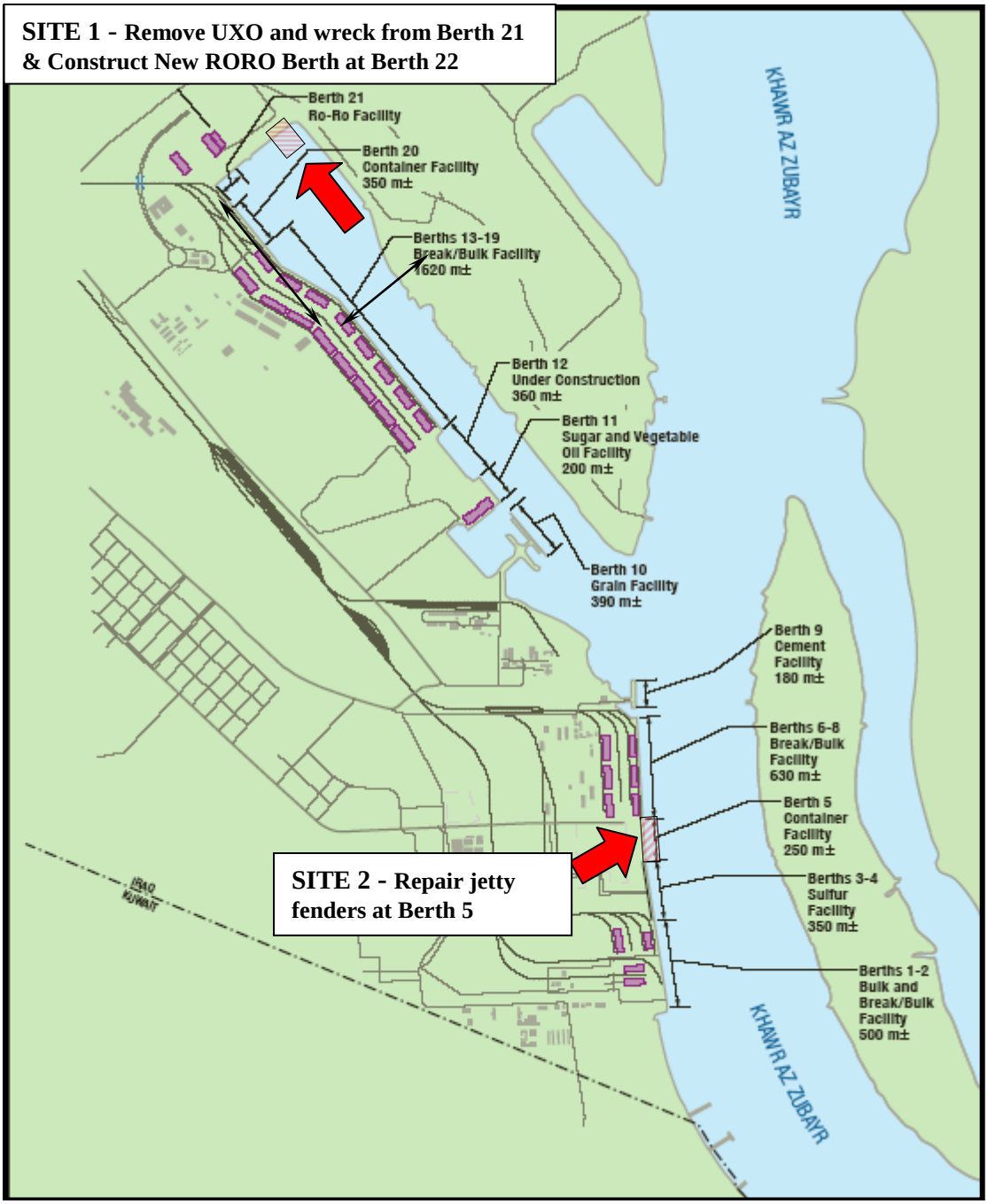


Figure 1. Port of Umm Qasr - RORO Berth 22 Site (Courtesy of the USACE)

Statement of Work

The Statement of Work (SOW) for this project consisted of minimum design requirements, constructing a new berth, and replacing existing fenders. Specifically:

Berth 21 UXO Removal for Berth 22 RORO New Construction

As a result of the war in 2003, U.S. and Iraqi UXO litter the waterway encompassing the construction site. The contractor will inspect the rectangular construction area, which extends 150 m from the edges of the paved parking area toward the water. The area is 60 m wide and extends 30 m left and right of the centerline of existing steel piles, which were installed under previous RORO berth construction. The specific tasks include:

- conduct initial site inspection of designated area
- submit plan for the most effective and efficient method of clearance
- mobilization to site
- conduct inspection and removal according to the approved plan
- provide final project documentation and certification that the designated area is safe to operate
- remove and expose all UXO in accordance with the U.S. Army Corps of Engineers technical specifications and International Mine Action Standards

Berth 22 RORO New Construction Design Requirements

- conduct a geotechnical investigation to determine the stratigraphy[4] and engineering parameters of the subsurface soil
- perform topographical and bathymetric[5] surveys to support design documents
- prepare a preliminary design report that develops three alternative configurations of the RORO berth
- prepare 60% and 90% design documents and submit to contracting officer
- construct RORO berth

Berth 5 Jetty Fenders Design Requirement

- conduct a geotechnical investigation to determine the stratigraphy and engineering parameters of the subsurface soil
- perform a site survey to determine the dimensions of the jetty fenders
- prepare design documents for approximately 20 jetty fenders that are missing or in poor condition and need replacing
- construct jetty fender repairs

The requirements to complete this project provided sufficient detail for the removal of the UXO and ship wreckage and other debris from Berth 21, construction of a new RORO Berth 22, and replacing approximately 20 jetty fenders at Berth 5.

Current Project Design and Specifications

The contract stated that the government was to provide the contractor a set of drawings and specifications. The contractor was to check and compare the drawings,

[4] The study and interpretation of vertical layers and sequences of rock layers.
[5] The measurement of the depth of bodies of water.

verify the figures, notify the contracting officer of any discrepancies, and be responsible for any errors.

The SOW required the contractor to complete the UXO removal and to design and install equipment, materials, and works in compliance with the following codes and regulations:

- International Mine Action Standards
- Department of Defense (DoD) 4145.26M DoD Contractors' Safety Manual for Ammunition and Explosives
- DoD Ammunition and Explosives Hazard Classification Procedures Joint Technical Bulletin
- Mine clearance manuals published by the United Nations
- EM 385-1-1, Safety and Health Requirements, U.S. Army Corps of Engineers
- American Standard of Testing Materials
- American Concrete Institute
- American Welding Society
- Concrete Suppliers Association Concrete Reinforcing Steel Institute (Federal Test Method Specification Portland Cement Association)

The GRS-approved design for RORO Berth 22 has a floating pontoon unloading dock, which attaches to a fixed bridge and shore abutment. The floating pontoon raises and lowers with the tides, while the fixed bridge remains static. To allow the pontoon freedom to adjust vertically, the contractor installed a hinged connection between the pontoon and bridge. Four guide rail/roller mechanisms stabilize the pontoon horizontally. Also, the contractor designed and connected separate mooring[6] and berthing dolphins[7] with rubber fenders and fixing vitas[8] by a pedestrian walkway bridge, which connects the dolphins to the shore.

In addition, the SOW required design documents for Berth 5's jetty fender repairs; approximately 20 jetty fenders were missing or in poor condition and needed to be replaced. The contractor was required to coordinate with the Iraqi Port Authority on the operational requirements for the jetty fenders to determine the appropriate design live loads and impact loads, based on the anticipated size and types of ships using the jetty fenders.

The contractor chose to match the existing fender design by using two steel H-piles with wooden front pads and rubber fenders. Before construction, the contractor coordinated with the Iraqi Port Authority to determine the loading anticipated and provided the proposed jetty fender design to GRS for approval.

The SOW required the contractor to include drawings, specifications, calculations, design schedules, construction schedules, bill of quantities, and a certified cost estimate for the project. Prior to submitting final as-built design documents for RORO Berth 22 and Berth 5, the SOW required progress submittals at the 60% and 90% design levels.

[6] Mooring: any device used to hold or secure watercraft by means of cables, anchors, or lines.

[7] A dolphin is a man-made marine structure that extends above the water level and is not connected to shore. They are usually installed to provide a fixed structure when it would be impractical to extend the shore to provide a dry access facility.

[8] A fixing vita is a metal structure that allows a boat to be tied off.

The contractor provided 30% and 90% design drawings to GRS. In the GRS documentation, a transmittal document, signed 13 June 2006, stated that the 60% RORO Berth 22 design drawings were approved; however, GRS could not provide SIGIR the 60% design drawings.

For the RORO Berth 22 project, the contractor provided detailed as-built design drawings, structural engineering calculations, jetty fender designs, and various design submittals. The as-built drawings included these and other plans and details:

- general notes
- foundation plans
- pile details
- pontoon details
- abutment details
- pontoon bridge details
- dolphin walkway details
- berthing dolphin details
- pontoon fixing roller details
- fender details

Based on SIGIR's review of the provided GRS documentation, RORO Berth 22 and the Berth 5 jetty fenders were adequately designed to construct the berth and replace the jetty fenders.

Site Progress During Construction

Throughout the project's construction, the contractor provided a weekly construction log that documented quality control, including photographs and work activities performed. In addition, the GRS Basrah Resident Office documented construction progress via quality assurance reports and photographs taken during visits to the site. SIGIR reviewed and subsequently relied on selected photographs to document examples of construction performance before the project was turned over to the Port General Manager on 10 September 2007.

Before the contractor could begin new construction at RORO Berth 22, the contractor cleared the UXO and wreckage from the areas around both Berth 21 and the future Berth 22. Site Photos 1-3 show the obstructed future site of Berth 22 with ship wreckage and debris that needed removal, and Berth 22 constructed and cleared of wreckage and debris (Site Photo 4).

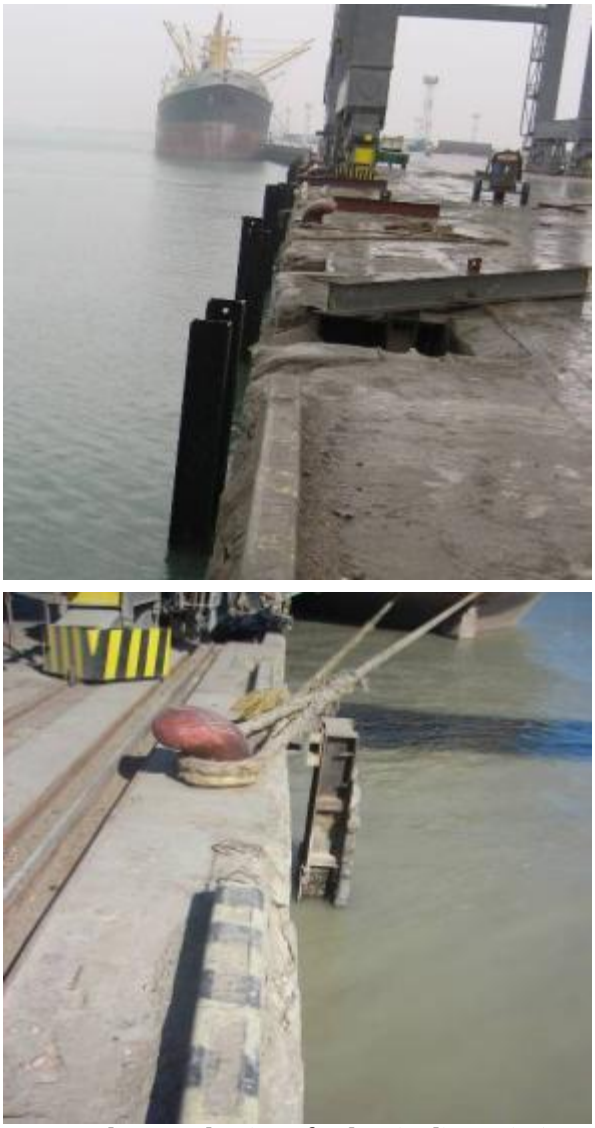
Site Photo 1. Obstructed future RORO Berth 22 site (Courtesy of GRS)

Site Photos 2 and 3. Wrecks at future RORO Berth 22 site (Courtesy of GRS)

Site Photo 4. Constructed RORO Berth 22 (Courtesy of GRS)

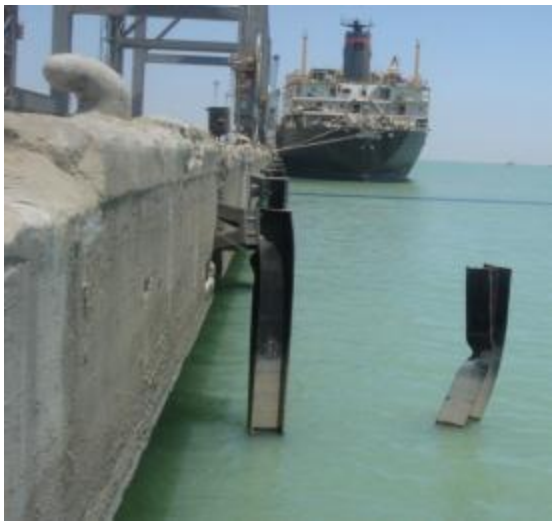
Also, the contract required the construction and repair of jetty fenders at Berth 5. The contract stated that the installed jetty fenders should be able to withstand live loads and impact loads from ships. The contractor removed the existing jetty fenders that were in disrepair and the partially constructed damaged fenders (Site Photos 5, 6, and 7). The local port authority continued using Berth 5, and the partially constructed fenders were damaged by a storm.

The contractor replaced the jetty fenders with new Seibu Polymer Corporation Trapezoid Type V 800HX1220L model rubber fenders. The new fenders include 400 millimeter (mm) H-piling[9], section stiffeners between the piles, and anchor bolts to affix the fenders to the existing concrete pier. Site Photo 8 shows the contractor painting with a coal tar epoxy to prevent corrosion, and Site Photo 9 documents the construction of the new jetty fenders at Berth 5.



Site Photos 5 and 6. Berth 5 jetty fenders in disrepair (Courtesy of GRS)

[9] H-piling is a general term for steel beams that have a cross-section similar to the letter "H". The steel beams come in different thickness, flange widths, and heights; however, the steel beams are commonly referred to as H-piles. The H-piles are driven into the ground to support foundations, for example retaining walls, and in this case as a support for the rubber fenders.



Site Photo 7. Damaged jetty fenders (Courtesy of GRS)

Site Photo 8. Painting with coal tar epoxy (Courtesy of GRS)

Site Photo 9. Berth 5 new jetty fenders (Courtesy of GRS)

Condition at Turnover

According to GRS documentation, authorized GRS Basrah Resident Office personnel conducted a final inspection on 13 September 2007; however, no final inspection report was written or photographs taken to document the condition of the project. GRS closeout documentation concluded the following:

> *"All work required by this contract has been accomplished in a satisfactory manner and is accepted without any noted deficiencies …The Contractor…has*

completed all assigned work. All parties acknowledge that the work performed under the contractor meets the standards set forth in the contract scope of work."

The GRS Basrah Resident Office Construction Representative signed this document, certifying that all work was completed and met the standards of the contract's SOW on 26 September 2007.

GRS Closeout Process Checklist

To establish a consistent transfer of projects to the Iraqi ministries, GRS established a turnover checklist with multiple documents that were signed by authorized GRS personnel, the contractor, and representatives from the Iraqi ministry accepting the project:

- Memorandum for Record signed by all three parties certifying that the work has been inspected and is accepted in accordance with contract requirements
- receipt of all required documentation (for example, design drawings)
- release of claims for the contractor
- contractor performance evaluation

On 10 September 2007, the GRS Basrah Resident Office officially turned over the RORO project to the Port General Manager. The contractor, GRS Basrah Resident Office representatives, and the Port General Manager signed a Memorandum for Record stating:

"This document certifies that all work has been inspected, and is accepted as being in accordance with the contract requirements. Construction at this facility is complete and no other work is to be performed as part of this contract unless noted below."

The turnover document also noted that the contractor had turned over and the Port General Manager had received the as-built drawings and the testing and/or commissioning documents.

GRS documentation stated that the warranty period for this project expired on 30 August 2008.

Site Assessment

On 6 January 2009, SIGIR performed an on-site assessment of the RORO Berth 22 project. During the site visit, SIGIR was accompanied by a representative of the GRS Basrah Resident Office and local Umm Qasr base personnel.

Limitations of Assessment

Due to security concerns, the time allotted for the site visit was approximately 45 minutes. SIGIR performed an expedited assessment of the areas available; however, a complete review of all work completed was not possible. SIGIR inspected the following areas of the RORO Berth 22 project:

- steel deck structure and abutment
- pontoon and pontoon decking
- guide rail/roller assemblies
- mooring and berthing dolphins
- steel walkway to dolphins
- adjacent parking and sidewalk area

Since time was limited, SIGIR could not perform an underwater inspection of the RORO Berth 22 project, and some requirements of the project could not be verified. SIGIR did not inspect these areas of the RORO Berth 22 project:

- seabed dredging
- UXO survey
- wreckage and debris removal
- pile conditions

Also, SIGIR did not inspect the jetty fender replacement at Berth 5.

RORO Berth 22

Figure 2 provides the design of the RORO Berth 22 project—a steel deck structure fixed to a concrete abutment and supported by piling. A pontoon is attached to the deck structure by a hinge mechanism, which can raise and lower according to the water level in the port (Site Photo 10). The pontoon has a steel deck structure, which allows ships to back up to the pontoon and load and unload cargo—rather than using a crane. This method of unloading is efficient for vehicles, passengers, and palletized cargo. The pontoon is affixed to four guide rail/roller assemblies, which allow the pontoon to raise and lower with the tide, but not to move laterally due to waves or ship movement.

Adjacent to the unloading deck, a steel walkway bridge connects the mooring and berthing dolphins to the shoreline sidewalk and parking area. The berthing dolphins and attached fenders allow for the absorption of some of the berthing energy,[10] as well as mooring of the ship. Mooring dolphins allow for secure mooring of the ship while loading and unloading. The pontoon is also affixed with rubber fenders to absorb the berthing energy.

[10] The kinetic energy of a berthing vessel.

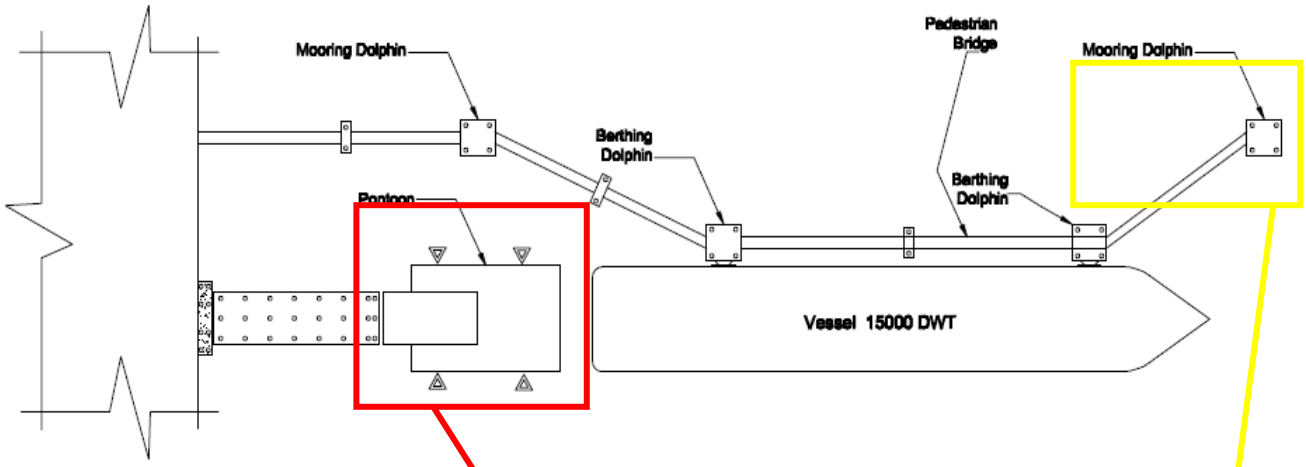


Figure 2. RORO Berth 22 overview (Courtesy of GRS)

Site Photo 10. Umm Qasr RORO Berth 22

Rail/Roller Assembly Damage

At the time of the site assessment, all four of the rail/roller assemblies had been severely damaged, including missing rollers and bent support beams. The specific cause of the damage could not be determined; however, GRS personnel stated that the damage was caused by careless/rough operations by port personnel. Based on information obtained from the site assessment and SIGIR's review of the project information, the cause of the damage was inconclusive, but SIGIR noted several factors as likely contributors.

Originally, the contractor designed the cushion roller assemblies with flexible elastomeric mounts (cushions) (Figure 3). The mounts permit relative movement of the rollers and prevent binding on the vertical tracks caused by irregularities in the roller system geometry.

The contractor installed the cushion rollers with steel spacer plates over the elastomeric mounts (Site Photo 11). The purpose of the steel spacer plates is unknown; however, the steel spacer plates effectively negate any cushioning effect between the roller and the mounts. Without some flexibility of the roller assembly, any irregularity in the roller system geometry would increase the axial load and possibly bind the roller assembly.

If the roller assemblies become bound within the tracks, the steel cantilevers supporting the assemblies will be subject to torsion forces from the pontoon. Apparently, this has

occurred: the damaged steel cantilevers exhibit textbook torsion failure of a steel wide flange section with transverse tearing of the flange (Site Photo 12).

It does not appear that the original design intended for the steel cantilevers to resist torsional loading; nevertheless, because of the configuration of the cushion roller assembly, this should have been considered as a possibility. The wide flange shapes used in the design have minimal torsional capacity, which would make them an inappropriate selection. A better design would utilize a section with increased torsional resistance, such as a round or square tube section.

Once a cushion roller assembly is damaged, the change in load path for the remaining roller assemblies could result in overload and additional assembly failures. This appears to have occurred; the roller assemblies are damaged or missing at all four pontoon-supporting pile locations (Site Photo 13).

Factors such as ships approaching the pontoon too fast or poor mooring during storms would increase loading on the roller assemblies and exacerbate the issues with the assembly mounting and potential binding. If present, these factors would accelerate damage of the assemblies.

Another possible cause of the damage to the rail/roller assemblies would be exceeding the maximum ship size to use RORO Berth 22. According to the design calculations, RORO Berth 22 was designed for a 15,000 deadweight tonnage ship with a maximum displacement of 27,500 tons. GRS personnel could not provide information on the size of ships actually using the facility. The continued lack of maintenance or repair of the rail/roller assemblies will result in further damage to the pontoon structure.

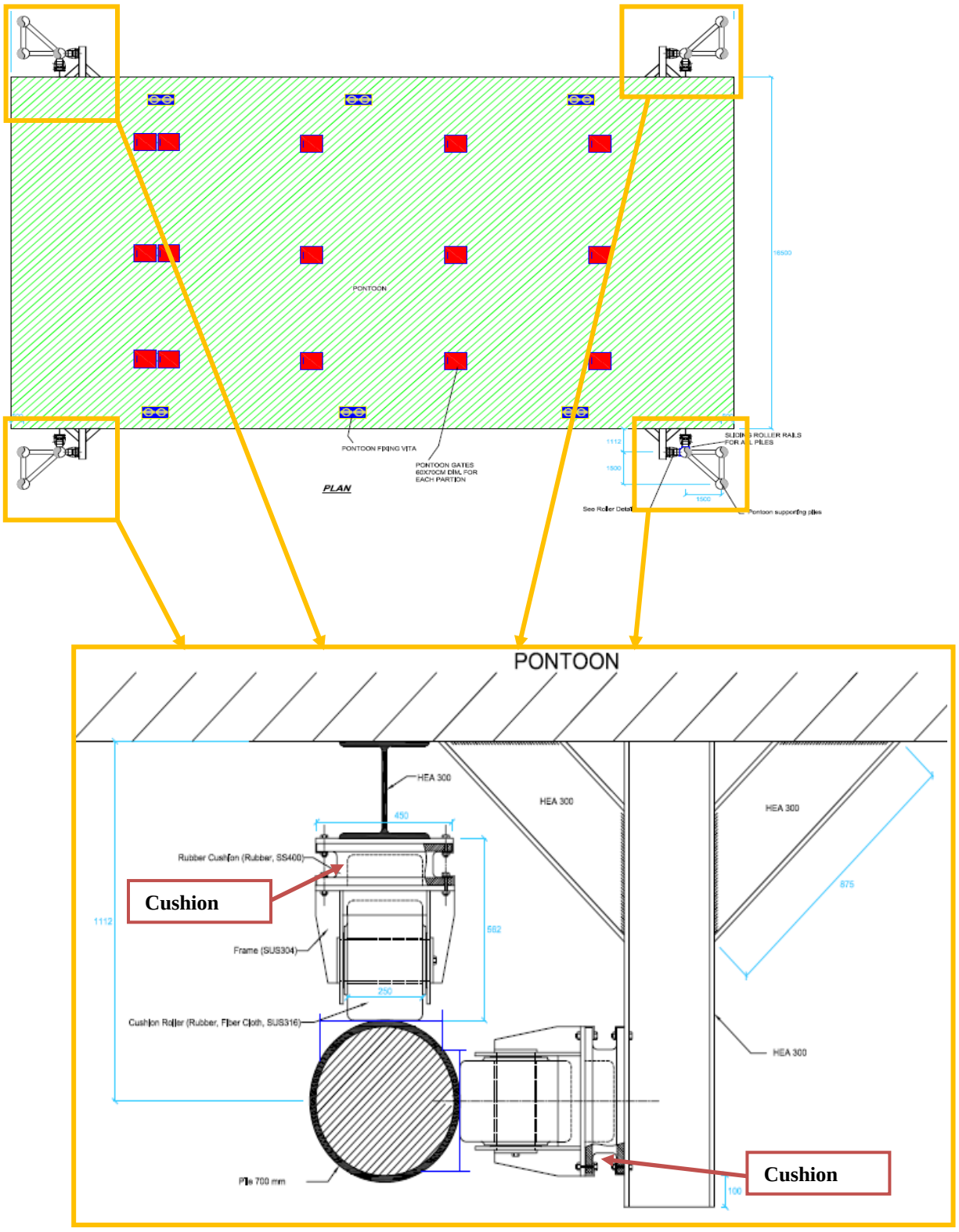
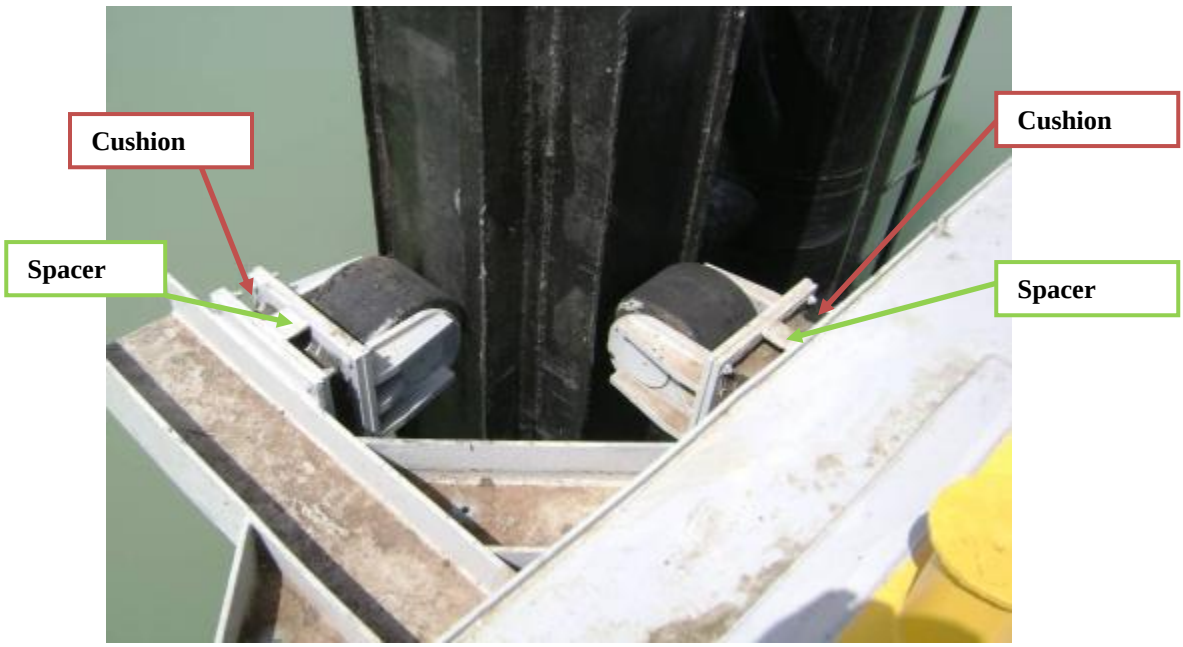


Figure 3. Rails/rollers - enlarged (Courtesy of the USACE)

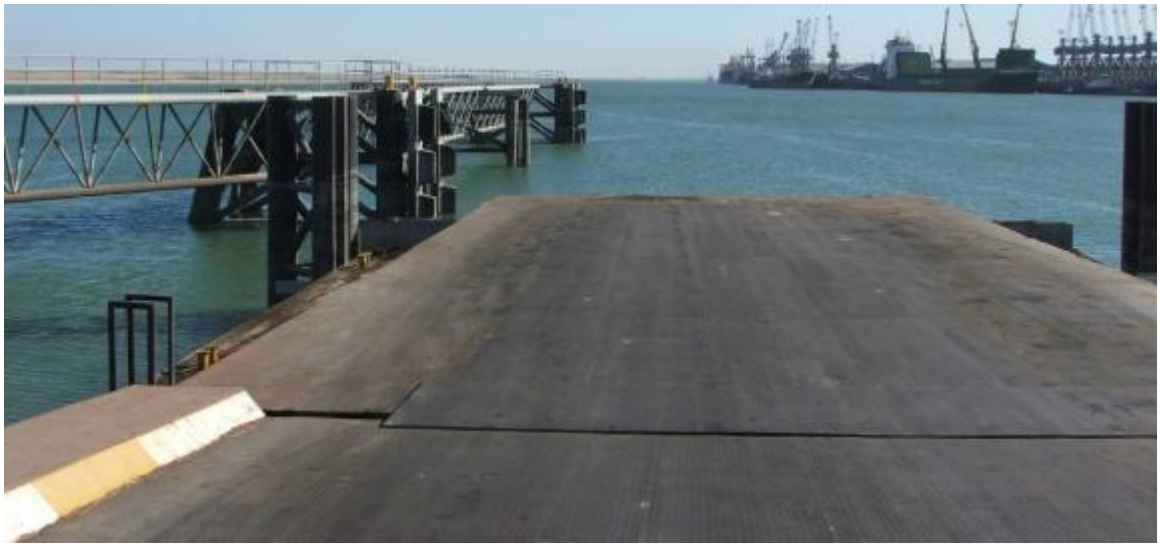


Site Photo 11. Cushion rollers with steel spacer plates (Courtesy of GRS)

Site Photo 12. Torsional failure of rail/roller

Site Photo 13. Missing rail/roller

During the site assessment, no ships were docked at the RORO Berth, and no loading or unloading was taking place (Site Photo 14). Unfortunately, as SIGIR departed, a ship was entering the port to dock at RORO Berth 22. Reviewing the docking methods and unloading and/or loading process would have been the best indicator of how the project was functioning, if the current damage is limiting the use of the facility, and if rough docking procedures are damaging the facility.



Site Photo 14. Empty RORO Berth 22

Berthing Dolphin Rubber Fender Damage

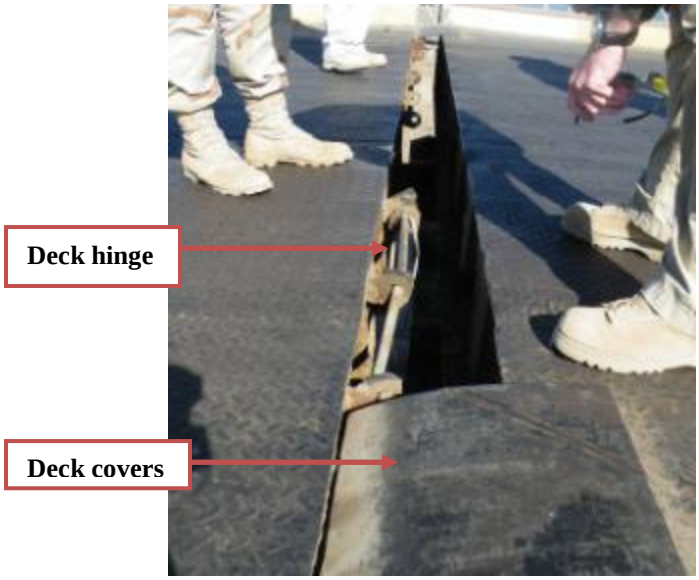
The design showed that RORO Berth 22 fenders were 600 mm high and 1150 mm long. At the time of the inspection, one of the rubber fenders on the first berthing dolphin had been severely damaged. The rubber fender appeared to be sheared off (Site Photos 15 and 16). The specific cause of the damage could not be determined; however, GRS personnel stated that the damage was caused by careless/rough operations by port personnel. In SIGIR's opinion, the damage was probably caused by ships approaching the dolphin too fast or poor mooring during storms. The damage will not have a significant impact on the operations of the facility; SIGIR considers this a minor maintenance issue.

Site Photos 15 and 16. RORO Berth 22 sheared rubber fenders

Steel Deck Hinges Damage

The contractor installed steel deck hinges to connect the fixed steel decking to the ramp decking. At the time of the site assessment, the steel deck hinges were damaged (Site Photo 17). The damage included missing hinges and steel deck covers. The specific cause of the damage could not be determined; however, the damage appears to be caused

by careless operation of vehicles and rolling stock[11] or traveling at excessive speeds over the hinge. In addition, SIGIR concludes that the damage of the cushion roller assemblies and resulting movement of the pontoon and attached ramp misaligned the ramp and exposed the plate to impact from vehicles and rolling stock.



Site Photo 17. RORO Berth 22 deck hinges

RORO Berth 22 has been operational for approximately two years, according to GRS and local port security documentation. The construction of RORO Berth 22 increased the efficiency and capacity of the Port of Umm Qasr. However, to ensure the continued operation of RORO Berth 22 and to maintain the increased capacity at the Port of Umm Qasr, the rail/roller assemblies must be repaired.

Conclusions

On 13 September 2007, a representative from the Gulf Region South (GRS)[12] Basrah Resident Office inspected the completed RORO Berth 22 project. The GRS representative did not write a final inspection report or take any photographs to document the condition of the project when accepted from the contractor. According to project file documentation, GRS closeout documentation concluded:

> *"All work required by this contract has been accomplished in a satisfactory manner and is accepted without any noted deficiencies …The Contractor…has completed all assigned work. All parties acknowledge that the work performed under the contractor meets the standards set forth in the contract scope of work."*

The GRS Basrah Resident Office representative signed the Memorandum for Closeout document on 26 September 2007, certifying that all work was completed and met the standards of the contract's Statement of Work.

[11] Rolling stock is the collective term that describes all vehicles that move in and out of a seaport.
[12] GRS is one of three districts under the United States Army Corps of Engineers (USACE) Gulf Region Division (GRD). GRD and its three districts provide construction management services and assist the Government of Iraq to maintain its own construction, operation, and maintenance program of essential services and national infrastructure.

On 10 September 2007, prior to inspection and certification of completion, the GRS Basrah Resident Office officially turned over the RORO Berth to the Port General Manager. The contractor, a representative from the GRS Basrah Resident Office, and the Port General Manager signed a Memorandum for Record stating:

> *"…this document certifies that all work has been inspected, and is accepted as being in accordance with the contract requirements. Construction at this facility is complete and no other work is to be performed as part of this contract unless noted below."*

On 6 January 2009, SIGIR conducted an on-site assessment of the project. During the site visit, RORO Berth 22 was not occupied, and freight was not being loaded or unloaded.

Before the site visit, SIGIR reviewed the design submittals for this project. The Statement of Work required the contractor to provide submittals at the 60% and 90% design levels, and then the final as-built design documents for RORO Berth 22 and Berth 5. SIGIR requested these submittals; GRS could not produce the 60% design drawings, but produced the 90% and as-built designs. SIGIR determined that the RORO Berth 22 and the Berth 5 jetty fenders were adequately designed.

Due to security concerns at the site, SIGIR performed only an expedited 45-minute assessment. SIGIR could not inspect the underwater requirements for the RORO Berth 22 or the jetty fenders at Berth 5; instead, SIGIR inspected these areas of RORO Berth 22:

- adjacent parking and sidewalk area
- steel deck structure and abutment
- pontoon and pontoon decking
- guide rail/roller assemblies
- mooring and berthing dolphins
- steel walkway to dolphins

SIGIR's review of design documentation, provided by GRS, determined that the initial construction of RORO Berth 22 appeared adequate. However, the site visit identified damage to the pontoon guide rail/roller assemblies; damage to the hinges that connect the steel structure decking and the pontoon decking; and two rubber fenders that need to be replaced on the berthing dolphins. The specific cause of the damage could not be determined; however, GRS personnel stated that the damage was caused by careless/rough operations by port personnel and lack of maintenance by the Government of Iraq.

SIGIR concluded that the construction of the RORO Berth facility was adequate; aside from the minor damages noted, the project was operating at the capacity provided for in the contract. At the time of the site visit, local port security documentation showed that RORO Berth 22 had been operational for approximately two years. Therefore, the construction of RORO Berth 22 had increased the efficiency and capacity of the Port of Umm Qasr.

Recommendations

To ensure the continued operation of Roll-On/Roll-Off Berth 22, SIGIR recommends that the U.S. Embassy Transportation Attaché communicate to the Iraqi Ministry of Transportation the need to repair or replace:

1. Pontoon guide rail and roller assemblies
2. Hinges that connect the steel structure decking and the pontoon decking
3. Two rubber fenders on the berthing dolphins

Management Comments

The U.S. Embassy Transportation Attaché verbally confirmed that the Iraqi Ministry of Transportation and Port of Umm Qasr officials had been informed of the needed repairs at Roll-On/Roll-Off Berth 22 and that his office would continue its on-going coordination actions with the Iraqi Ministry of Transportation and Port of Umm Qasr officials to locate funding for the needed repairs.

In addition, SIGIR received comments on the draft of this report from the Commanding General, GRD, stating that "the report adequately addresses the Gulf Region South district office's performance on the subject contract."

Evaluation of Management Comments

SIGIR appreciates the prompt action taken by the U.S. Embassy Transportation Attaché to resolve the issues identified in this report as well as the clarifying information provided by GRD. As a result, no additional comments are required.

Appendix A. Scope and Methodology

SIGIR performed this project assessment from December 2008 through May 2009 in accordance with the Quality Standards for Inspections issued by the Council of the Inspectors General on Integrity and Efficiency. The assessment team comprised an engineer/inspector and two auditors/inspectors.

In performing this Project Assessment SIGIR:

- Reviewed contract documentation to include Contract W917BK-06-C-0004, modifications P00001, P00002, P0003, and P0004 , quality control reports, quality assurance reports, project closeout documentation, and other items;
- Reviewed the design package (plans) and photographs documenting construction progress;
- Interviewed Gulf Region South Basrah Area Office and Umm Qasr personnel; and
- Conducted an on-site assessment on 6 January 2009 and documented results at the Roll-On/Roll-Off Berth project in Umm Qasr, Iraq.

Scope Limitation. Due to security concerns, SIGIR performed only an expedited assessment. The time allotted for the RORO berth was approximately 45 minutes; therefore, a complete review of all work completed was not possible.

Appendix B. Acronyms

DoD	Department of Defense
GRD	Gulf Region Division
GRS	Gulf Region South
m	meter
mm	millimeter
RORO	Roll-On/Roll-Off
SIGIR	Special Inspector General for Iraq Reconstruction
SOW	Statement of Work
UXO	unexploded ordnance

Appendix D. GRD Comments on Draft Report

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
GULF REGION DIVISION
BAGHDAD, IRAQ
APO AE 09348

REPLY TO
ATTENTION OF

CEGRD-CG

1 June 2009

MEMORANDUM FOR Special Inspector General for Iraq Reconstruction, US Embassy Annex II, Room 1013, APO AE 09316

SUBJECT: SIGIR Draft Project Assessment Report – Roll-On-Roll- Off Berth, Port of Umm Qasr, Iraq, SIGIR Report Number PA-08-162

1. The Gulf Region Division reviewed the subject draft report and provides comments in the enclosure.

2. Thank you for the opportunity to review the draft report and provide our written comments for incorporation in the final report.

3. If you have any questions, please contact Mr. Robert Donner at (540) 665-5022 or via email Robert.L.Donner@usace.army.mil.

Michael R. Eyre

Encl
as

MICHAEL R. EYRE
Major General, USA
Commanding

Appendix D. GRD Comments on Draft Report

COMMAND REPLY
to
SIGIR Draft Project Assessment Report –
Roll-On-Roll- Off Berth, Port of Umm Qasr, Iraq
SIGIR Report Number PA-08-162
(SIGIR Project PA-08-162)

Overall Comment. The report adequately addresses the Gulf Region South district office's performance on the subject contract.

Additional Comments:

1. Draft Report, page i, Conclusion, second sentence. The GRS representative did not write a final inspection report or take any photographs to document the condition of the project when accepted from the contractor.

GRD Comment. A final inspection report with photographs to document conditions at point of project turnover would have been beneficial, but the intent of the final inspection was met with a GRS established turnover checklist with multiple documents that were signed by authorized GRS personnel, the contractor, and representatives from the Iraqi ministry accepting the project:

- Memorandum for Record signed by all three parties certifying that the work has been inspected and is accepted in accordance with contract requirements
- receipt of required documentation
- release of claims for the contractor
- contractor performance evaluation

Enclosure

Appendix E. Report Distribution

Department of State

Secretary of State
- Senior Advisor to the Secretary and Coordinator for Iraq
- Director of U.S. Foreign Assistance/Administrator, U.S. Agency for International Development
  - Director, Office of Iraq Reconstruction
- Assistant Secretary for Resource Management/Chief Financial Officer, Bureau of Resource Management

U.S. Ambassador to Iraq
- Director, Iraq Transition Assistance Office
- Mission Director-Iraq, U.S. Agency for International Development

Inspector General, Department of State

Department of Defense

Secretary of Defense
Deputy Secretary of Defense
Under Secretary of Defense (Comptroller)/Chief Financial Officer
- Deputy Chief Financial Officer
- Deputy Comptroller (Program/Budget)

Deputy Assistant Secretary of Defense-Middle East, Office of Policy/International Security Affairs
Inspector General, Department of Defense
Director, Defense Contract Audit Agency
Director, Defense Finance and Accounting Service
Director, Defense Contract Management Agency

Department of the Army

Assistant Secretary of the Army for Acquisition, Logistics, and Technology
- Principal Deputy to the Assistant Secretary of the Army for Acquisition, Logistics, and Technology
- Deputy Assistant Secretary of the Army (Policy and Procurement)
- Commanding General, Joint Contracting Command-Iraq/Afghanistan

Assistant Secretary of the Army for Financial Management and Comptroller
Chief of Engineers and Commander, U.S. Army Corps of Engineers
- Commanding General, Gulf Region Division
- Chief Financial Officer, U.S. Army Corps of Engineers

Auditor General of the Army

U.S. Central Command

Commanding General, Multi-National Force-Iraq
- Commanding General, Multi-National Corps-Iraq
- Commanding General, Multi-National Security Transition Command-Iraq
- Commander, Joint Area Support Group-Central

Other Federal Government Organizations

Director, Office of Management and Budget
Comptroller General of the United States
Inspector General, Department of the Treasury
Inspector General, Department of Commerce
Inspector General, Department of Health and Human Services
Inspector General, U.S. Agency for International Development
President, Overseas Private Investment Corporation
President, U.S. Institute of Peace

Congressional Committees

U.S. Senate

Senate Committee on Appropriations
Senate Committee on Armed Services
Senate Committee on Foreign Relations
Senate Committee on Homeland Security and Governmental Affairs

U.S. House of Representatives

House Committee on Appropriations
House Committee on Armed Services
House Committee on Oversight and Government Reform
House Committee on Foreign Affairs

Appendix F. Project Assessment Team Members

The Office of the Assistant Inspector General for Inspections, Office of the Special Inspector General for Iraq Reconstruction, prepared this report. The principal staff members who contributed to the report were:

Angelina Johnston

Kevin O'Connor

Todd Criswell, P.E.