

OFFICE OF THE SPECIAL INSPECTOR GENERAL FOR IRAQ RECONSTRUCTION

**REPAIR OF THE AL GHAZALIYAH
G-6 SEWAGE LIFT STATION
UNDER THE COMMANDER'S EMERGENCY RESPONSE PROGRAM
BAGHDAD, IRAQ**

**SIGIR PA-07-118.1
APRIL 22, 2008**



SPECIAL INSPECTOR GENERAL FOR IRAQ RECONSTRUCTION

April 22, 2008

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

SUBJECT: Report on Project Assessment of the Repair of the Al Ghazaliyah G-6
Sewage Lift Station, Baghdad, Iraq (Report Number SIGIR PA-07-118.1)

The Office of the Special Inspector General for Iraq Reconstruction is assessing projects funded under the Commander's Emergency Response Program to provide real-time relief and reconstruction information to interested parties to enable appropriate action, when warranted.

This report is being provided for your information and use. It addresses the current status of the repair of the Al Ghazaliyah G-6 Sewage Lift Station, Baghdad, Iraq and whether intended objectives will be achieved.

This report does not contain any negative findings or recommendations for corrective action. As a result, management comments on the draft report were not required. However, we received comments on a draft of this report from the Gulf Region Division of the United States Army Corps of Engineers which generally agreed with the facts and figures reported and offered no additional comments.

We appreciate the courtesies extended to our staff. If you have any questions please contact Mr. Brian Flynn at brian.flynn@iraq.centcom.mil or at DSN 318-343-9244. For public or congressional queries concerning this report, please contact SIGIR Congressional and 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-07-118.1

April 22, 2008

Repair of the Al Ghazaliyah G-6 Sewage Lift Station Under the Commander's Emergency Response Program Baghdad, Iraq

Synopsis

Introduction. The Office of the Special Inspector General for Iraq Reconstruction is assessing projects funded under the Commander's Emergency Response Program to provide real-time relief and reconstruction information to interested parties to enable appropriate action, when warranted. The overall objectives were to determine whether completed projects complied with the terms of their contracts and task orders and to evaluate the effectiveness of the monitoring and controls exercised by administrative quality assurance and contract officers. The Special Inspector General for Iraq Reconstruction conducted this project assessment in accordance with the Quality Standards for Inspections issued by the President's Council on Integrity and Efficiency. The assessment team included an engineer/inspector and two auditors/inspectors.

The objective of the contract was to restore two lift stations in the Ghazaliyah area to designed operational capacity. On September 26, 2006, Delivery Order 0006 of contract W917BG-06-D-0007 was issued to a local contractor for \$328,775. The repair and rehabilitation work was to include replacement and maintenance of generators and pumps at each site, necessary electrical and control work, and limited architectural renovations. The two lift stations covered by this contract were the Al Ghazaliyah G-6 and G-7 sewage lift stations. The Notice to Proceed was issued on November 7, 2006, with a period of performance to complete the project in 150 days. The delivery order was terminated on 10 November 2007 because a "Change in Security Conditions" occurred at both sewage lift stations, which prohibited the contractor from completing the projects.

Project Assessment Objective. The objective of this project assessment was to provide real-time relief and reconstruction project information on the repair of the Al Ghazaliyah G-6 Sewage Lift Station in Baghdad, Iraq to interested parties to enable appropriate action, when warranted. Specifically, the Special Inspector General for Iraq Reconstruction determined whether:

1. Project components were adequately designed prior to construction or installation;
2. Construction or rehabilitation met the standards of the design;
3. The contractor's quality control plan and the United States government's quality assurance program were adequate;
4. Project sustainability was addressed; and
5. Project results were consistent with original objectives.

Previously, the United States Army was able to escort the SIGIR inspection team to the Al Ghazaliyah G-7 sewage lift station¹. But because of insurgent activity in the area of the Al Ghazaliyah G-6 sewage lift station, both the United States Army and the private

¹ See SIGIR Assessment Report No. SIGIR PA-07-118, "Repair of the Al Ghazaliyah G-7 Sewage Lift Station," 25 January 2008.

security contractor denied the assessment team's repeated requests for escorts to inspect the site. Consequently, this assessment relies solely on information obtained from the contract file and aerial imagery of the project site. The contract file included the contract, contract modifications, Bill of Quantity, quality control and quality assurance reports, construction progress photographs, and invoices.

Conclusions. The assessment determined that:

1. The contract file did not contain documentation of component design. The contract's Statement of Work required the contractor to prepare architectural, structural, mechanical, plumbing, and electrical designs; the Bill of Quantity required the contractor to inspect and report on the cover pumps, valves, lines, manholes, controls, generators, and distribution panels. The required design submittals from the contractor—such as schematic diagrams identifying the flow of sewer water entering and exiting the Al Ghazaliyah G-6 and throughout the Al Ghazaliyah area—were not included in the contract file. In addition, no diagrams providing clarity on the location and function of specific pieces of equipment were included.
2. Because inspectors were unable to visit the Al Ghazaliyah G-6 sewage lift station, SIGIR based the assessment of work quality on contract file documentation. The contract file documented that the United States Army Corps of Engineers conducted an inspection in April 2007, which found incomplete work done by the contractor. For example, one submersible pump was not connected to the generator or national power grid, and the piping connection was not completed, the ampere meter for the generator was not working, and poor quality work was noted in the service building. The United States Corps of Engineers brought these deficiencies to the attention of the contractor.
3. The contractor's quality control plan was sufficiently detailed, including the use of daily quality control reports to document construction deficiencies; but contract file documentation indicated that the contractor's quality control program implementation did not identify any significant construction deficiencies, such as potentially dangerous electrical installation practices. Further, there was no quality control deficiency log for this project.

The United States government quality assurance program suffered from the deteriorated security situation in the area. According to United States Army Corps of Engineers documentation, only 11 daily quality assurance reports exist for this project; the last daily quality assurance report was issued in December 2006.

4. The contract and delivery order requirements addressed sustainability. The contract's "Warranty Management" clause required the contractor to provide a one-year overall warranty of construction; the delivery order required the contractor to provide all operations and maintenance manuals and all certified warranties. To maintain continuous use of the on-site generators, the delivery order provided that the sewage lift station be furnished with a six-month fuel supply.
5. As noted, the contract was terminated because the deteriorated security situation in the area prohibited the contractor from completing work. Consequently, the Al Ghazaliyah G-6 sewage lift station renovation and construction project results were not consistent with the original objectives of the delivery order. The

delivery order Statement of Work required the contractor to “provide a complete and useable facility upon the conclusion of construction....” When the contract was terminated, the Al Ghazaliyah G-6 facility was not operational. Contract file documentation shows that the facility was not connected to the main distribution grid.

Assumption of Responsibility by the Government of Iraq. The Joint Reconstruction Operations Center was created to coordinate and synchronize Baghdad reconstruction efforts. The Joint Reconstruction Operations Center comprises representatives from Multi-National Forces - Iraq, Multi-National Corps - Iraq, Multi-National Division - Baghdad, U.S. Department of State, Provincial Reconstruction Team – Baghdad, United States Agency for International Development, Government of Iraq, and United States Army Corps of Engineers - Gulf Region Division.

Each organization provides data to the Joint Reconstruction Operations Center, which then "presents a unified voice" to the Joint Planning Commission. The Joint Planning Commission decides on service projects for targeted areas. Under this process, the Amanat (Baghdad city government) has assumed responsibility for a number of sewage projects in Baghdad, including the Al Ghazaliyah G-6 sewage lift station.

Recommendations and Management Comments. In view of the current security situation in the Al Ghazaliyah area and the assumption of responsibility for a number of sewage projects in Baghdad including the Al Ghazaliyah G-6 sewage lift station by the Amanat, this report does not contain recommendations for corrective action. Therefore, management comments were not required. However, we received comments on a draft of this report from the Gulf Region Division of the United States Army Corps of Engineers which generally agreed with the facts and figures reported and offered no additional comments.

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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 on the repair of the Al Ghazaliyah G-6 Sewage Lift Station in Baghdad, Iraq to interested parties to enable appropriate action to be taken, when warranted. Specifically, the Office of the Special Inspector General for Iraq Reconstruction (SIGIR) determined whether:

1. Project components were adequately designed prior to construction or installation;
2. Construction or rehabilitation met the standards of the design;
3. The contractor's quality control (QC) plan and the U.S. government's quality assurance (QA) program were adequate;
4. Project sustainability was addressed; and
5. Project results were consistent with original objectives.

Previously, the U.S. Army was able to escort the SIGIR inspection team to the Al Ghazaliyah G-7 sewage lift station and the results were provided in a separate assessment². But because of insurgent activity in the area of the Al Ghazaliyah G-6 sewage lift station, both the U.S. Army and the private security contractor denied the assessment team's repeated requests for escorts to inspect the site. Consequently, this assessment relies solely on information obtained from the contract file and aerial imagery of the project site. The contract file included the contract, contract modifications, Bill of Quantity (BOQ), QC and QA reports, construction progress photographs, and invoices.

Pre-Site Assessment Background

Contract, Costs and Payments

Contract W917BG-06-D-0007, awarded on 24 March 2006 to a local contractor, was an indefinite delivery/indefinite quantity contract, with a 12-month base year and two, 12-month option years. The Not To Exceed amount of the contract was \$20 million.

Delivery Order (DO) 0006 of contract W917BG-06-D-0007 was issued on 26 September 2006. This firm-fixed-fee DO was in the amount of \$328,775. The Notice to Proceed was issued on 7 November 2006 with a period of performance to complete the project in 150 days.

On 10 November 2007, a Contract Modification Letter of Direction was issued by the United States Army Corps of Engineers (USACE) Gulf Region Central (GRC) for DO 0006. The contract modification stated that the U.S. government determined a "Change in Security Conditions" occurred at both sewage lift station sites, which prohibited the contractor from completing the projects. Consequently, the GRC Resident Office decided to descope all items not completed at both project sites. A

² See SIGIR Assessment Report No. SIGIR PA-07-118, "Repair of the Al Ghazaliyah G-7 Sewage Lift Station," 25 January 2008.

negotiated price of \$253,246.15 was agreed upon to compensate the contractor for work completed at both project sites.

Project Objective, Pre-Construction Description

The objective of the project was to repair and renovate two existing sewage lift stations. Specifically, the “contractor is responsible to provide a complete and useable facility upon the conclusion of construction.”

The description of the facility (pre-construction) was based on information obtained from the contract and the USACE project file. The objective of the DO was to restore two lift stations, in the Al Ghazaliyah area, to designed operational capacity. Specifically, the repair and rehabilitation work was to include replacement and maintenance of generators and pumps at each site, as well as necessary electrical and control work and limited architectural renovations. The two lift stations covered by this contract were the Al Ghazaliyah G-6 sewage lift station (Site Photo 1) and the Al Ghazaliyah G-7 sewage lift station.



Site Photo 1. Exterior view of the Al Ghazaliyah G-6 sewage lift station

The Al Ghazaliyah area of Baghdad is a predominantly residential neighborhood consisting of several blocks of one and two-story houses and some small businesses (Aerial Image 1).

The two Al Ghazaliyah sewage lift stations service the Al Ghazaliyah area (Aerial Image 2). A sewage lift station is used to raise the elevation of and facilitate the flow of sewer water across several areas or neighborhoods. In Iraq, the wastewater systems use gravity to transport waste from homes and businesses to undergo water treatment at a central facility. In the city of Baghdad, there are many changes in elevation, which require the use of lift stations to pump the wastewater to higher elevations.

Prior to the issuance of the contract, this area of Baghdad suffered from excessive amounts of backed-up sewer water in the neighborhood streets. This required residents to wade through large pools of sewer water when leaving and entering their homes. Consequently, the situation left the neighborhood residents in constant threat of disease and illness.

Little information about the origin and condition of the Al Ghazaliyah G-6 is known. It appears this facility was constructed under the former regime, but was never completely finished or operated.



Aerial Image 1. Neighborhood surrounding the Al Ghazaliyah G-6 sewage lift station



Aerial Image 2. Location of the Al Ghazaliyah G-6 and G-7 sewage lift stations

According to the contract's BOQ, the contractor was to do the following:

"...inspect two (2) sewer lift stations in the Ghazaliyah Area and prepare report of necessary improvements to restore the lift station facilities to design"

operational capacity. Contractor shall submit Report to Resident Engineer for approval prior to commencing repair activities. Report shall indicate problem, solution, and equipment replacement or repair required. Inspection shall cover pumps, valves, lines, manholes, controls, generators, cabling main, distribution panels, and the like.”

According to an “Engineering Report” completed by the contractor after being awarded the contract, the Al Ghazaliyah G-6 and G-7 sewage lift stations each consist of a single two-story building. In the basement of each building is the wet well; while the electrical control panels are located on the ground floor. According to the “Engineering Report”, both lift stations have two, 6-inch submersible pumps, each with 0.3 cubic meters per second capacity. However, the “Engineering Report” did not indicate whether the existing submersible pumps were operational. The Al Ghazaliyah G-6 sewage lift station receives wastewater from Mahallas (neighborhoods) 655 and 667.

Further, the “Engineering Report” and the contract file lacked any schematic diagrams to show the flow of sewer water between the two lift stations or the number and location of manholes throughout the Al Ghazaliyah area. In addition, the contract file did not contain any information regarding the condition of the sewer lines leading into and out of the lift station. This information is critical to determine the causes of sewer water backup throughout the area. In aerial imagery of the Mahallas served by the Al Ghazaliyah G-6 and G-7 sewage lift stations, numerous areas of standing pooled sewage water were visible (Aerial Image 3 and Site Photos 2 and 3). Prior to the initiation of the renovation of the lift stations, the cause of the pooled sewage water needed to be determined. According to the USACE’s Gulf Region Division (GRD), the broken sewer lines are the responsibility of the Amanat (Baghdad city government).

Finally, the “Engineering Report” did not identify or determine the “design operational capacity” of the Al Ghazaliyah G-6 sewage lift station.

Examples of backed up sewage water throughout the Al Ghazaliyah neighborhood between the two sewage lift stations



Site Photo 2. Street surrounding the Al Ghazaliyah G-7 station



Site Photo 3. Street surrounding the Al Ghazaliyah G-7 station



Aerial Image 3. Amount of standing pooled sewage throughout the Al Ghazaliyah neighborhood

Statement of Work

The USACE's Statement of Work (SOW) to rehabilitate the Al Ghazaliyah G-6 sewage lift station required the contractor to perform the following:

- supply and install two 150 millimeter (mm) submersible pumps to match the existing pumps together with all necessary piping and controls
- inspect and repair or replace the existing pump hoist as required
- supply and install 100 kilo-Volt Amp (kVA) generator, to be installed on 200 mm reinforced concrete pads, sized to allow for continuous operation of the station and the care taker facility
- supply and install Main Distribution Panel for the facility together with all necessary switches, breakers, and cabling to connect the facility to the generator and to the main distribution grid
- supply and install an oil-filled, pad mounted transformer sized to allow the connection of the facility to the main distribution grid
- supply and install the cabling necessary to connect the facility to the main distribution grid
- provide and install all material necessary to construct a service building consisting of a 4x5 meter (m) guard/operator's room, kitchen, and bathroom; the building must have high quality finishes, tile, paint, and include all electrical and water services
- supply and install in care taker building packaged one ton split air conditioning unit capable of heating and cooling with electrical connection
- repair or construct perimeter wall and gate; wall shall be plastered, stuccoed, primed, and painted with two coats of high quality paint inside and out
- perform routine periodic maintenance of the facility's generators per the manufacturer's recommendations
- supply fuel for 6 months of operation (deliveries to be made weekly for the 6 month period)

Project Design and Specifications

The SOW required the submission of the "design of all site civil work and utilities; architectural, structural, mechanical, plumbing, electrical, life safety, and communications design." In addition, "shop drawings and specifications for the generators and pumps must be submitted for review and approval." The completed construction drawings, design calculations, and construction specifications were to be submitted to the Resident Engineer for review. The drawings were to "contain all the details necessary to assure clear understanding of the work throughout construction."

The SOW also required that all work must comply with the following codes and standards:

- International Building Code (IBC)
- International Existing Building Code (IEBC)
- International Electric Technical Commission (IEC)
- National Fire Protection Association (NFPA)

- Sheet Metal and Air Conditioning Contractor’s National Association (SMACNA)
- International Mechanical Code (IMC)
- International Plumbing Code (IPC)
- International Standards Organization (ISO)

The contract file lacked any design submittals from the contractor. There were no schematic diagrams or drawings identifying the flow of sewer water into and out of the Al Ghazaliyah G-6 sewage lift station and throughout the Al Ghazaliyah area. In addition, there are no diagrams or drawings providing clarity on the location and function of specific pieces of equipment. For instance, the SOW required the installation of two-150 mm submersible pumps to match the existing pumps. However, it is unclear whether the two submersible pumps were to replace or compliment the existing pumps (Site Photo 4). The contract file lacked design calculations determining the volume of sewer water entering the facility and the capacity of each pump, which would identify the correct number and size of submersible pumps needed for installation.



**Site Photo 4. Interior view of Al Ghazaliyah G-6 building
(Photo courtesy of the USACE)**

The SOW required the “design of all site civil work and utilities; architectural, structural, mechanical, plumbing, electrical, life safety, and communications...” Site plans were needed to identify the existing and new underground/above ground utilities. In addition, since the contractor was to install the Main Distribution Panel and connect the facility to the generator and the main distribution grid, design submittals were required for the electrical distribution system design, including flow diagrams. Also, electrical plans and an electrical single-line diagram were needed–

showing details for equipment installation, schedules of fixtures, and main and branch circuit distribution detail.

Although the contractor did not provide drawings that “contain all the details necessary to assure a clear understanding of the work throughout construction,” construction/renovation of the Al Ghazaliyah G-6 sewage lift station was initiated and continued.

Site Assessment

Due to insurgent activity in the area of the Al Ghazaliyah G-6 sewage lift station, both the U.S. Army and private security contractor denied the assessment team’s repeated requests for escorts to inspect the site. Consequently, this assessment relied solely on information obtained from the contract file and aerial imagery.

At the time of termination, GRC invoice documentation indicated the contractor completed approximately 82 percent of the project.

Installation of two 150-mm submersible pumps

The SOW required the contractor to supply and install two 150-mm submersible pumps, including all necessary piping and controls. According to GRC documentation, the contractor was compensated for 75 percent of the installation of the two 150-mm submersible pumps.

The SOW, when compared to the contractor’s “Engineering Report”, indicates the two submersible pumps will be installed inside the G-6 building. Specifically, the two submersible pumps were to match the existing pumps. However, according to a site visit conducted by the USACE in April 2007, the submersible pumps are located outside the G-6 building (Site Photo 5). A site report was written and stated that “one of the submersible pumps still is not connected electronically to the generator or to the national power, piping connection not completed yet.” The two pumps visible in Site Photo 5 appear to be above-ground diesel pumps, not submersible pumps.

The contract file lacked documentation to explain the need for the above-ground diesel pumps and/or submersible pumps outside the lift station facility. Given the absence of contract file documentation and the SIGIR inspection team’s inability to visit the site because of the security situation, available contract file photographs indicate the pumps were used outside. It is possible they were used to bypass the G-6 facility and pump the sewer water from the manhole in front of the facility to the next one along the line. This would provide short term relief of incoming sewer water to the G-6 facility while the contractor renovated and upgrades the facility. As previously mentioned in the Project Design and Specifications section, the contractor did not provide design drawings to identify the use of the equipment required by the SOW. However, it appeared the original intent was to use the two submersible pumps either to replace or compliment the two existing submersible pumps inside the facility.

Further, based solely upon available contract file documentation, we cannot determine if the submersible pumps were ever delivered or installed. For example, none of the daily QA reports mention the delivery or installation of the submersible pumps; while the daily QC reports are contradictory regarding the delivery and installation of the pumps. For instance, on 14 December 2006 and 16 December 2006, the contractor’s QC daily reports each stated “installing the pump;” while the 17 December 2006 daily QC report stated

“installed the two pumps.” However, this is contradicted by five subsequent daily QC reports, each stating “supplying the pumps.” None of the three daily QC reports provided photographs of the contractor installing the pumps. The contract file lacked any photographs or narratives to verify the delivery and installation of the two 150-mm submersible pumps.

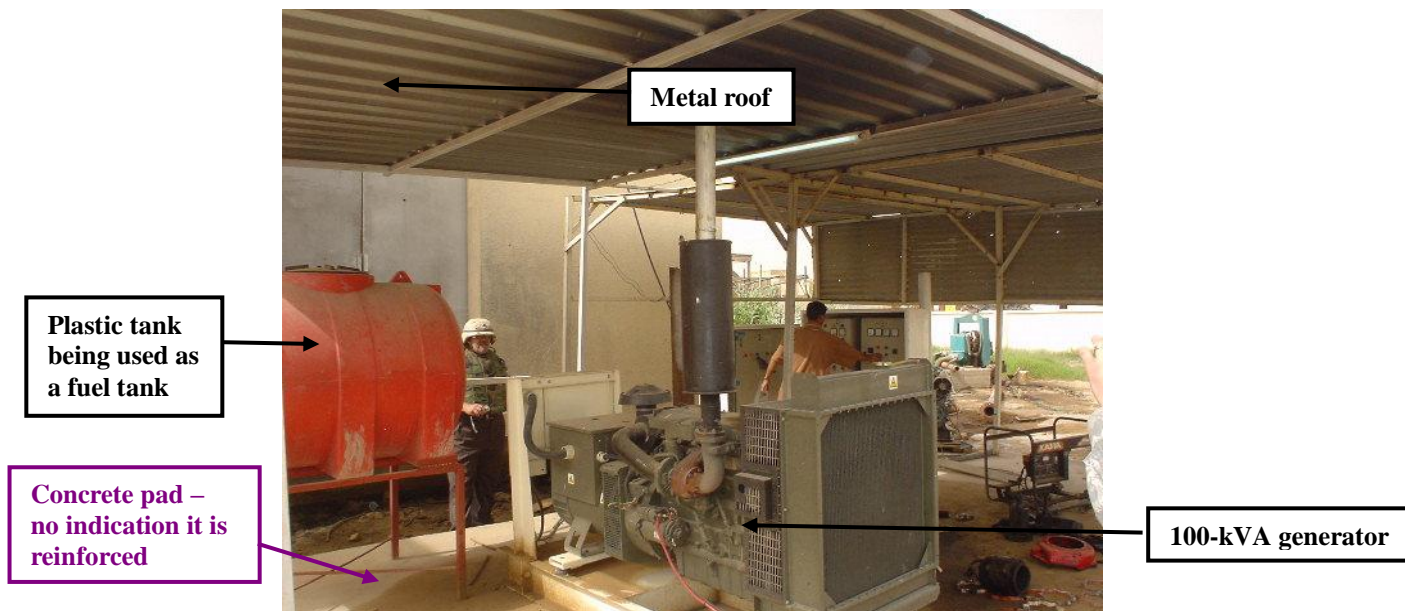


Site Photo 5. Manhole outside the G-6 building (Photo courtesy of the USACE)

Installation of the 100-kVA generator set

The SOW required the installation of a 100-kVA generator set, including a 1,000-liter fuel tank. According to GRC documentation, the contractor was compensated 100 percent for the delivery and installation of a 100-kVA generator set.

Included in the contract file were photographs documenting the delivery of the 100-kVA generator set (Site Photos 6). However, according to the USACE April 2007 site visit, the “ampere meter of the generator is not working.” In May 2007, a daily QC report stated that the contractor was “fixing the ampere meter of the generator;” however, there is no documentation in the contract file to confirm the ampere meter was fixed or tested.



**Site Photo 6. Contractor provided 100-kVA generator
(Photo courtesy of the USACE)**

Installation of metal roof to cover generator and fuel tank

The SOW required the installation of a metal roof on a tubular frame to cover the generator and fuel tank. The roof and frame were to be primed and painted with two coats of high quality paint. According to GRC documentation, the contractor was compensated 90 percent for the installation of the metal roof cover for the generator and fuel tank.

Included in the contract file documentation was a photograph verifying the installation of the metal roof (Site Photo 6).

Installation of a transformer

The SOW required the installation of an oil-filled pad-mounted transformer, sized to allow the connection of the facility to the main distribution grid. Photographs in the contract file documents that a pad type transformer was mounted on the electrical pole and connected to the main distribution grid (Site Photo 7).



**Site Photo 7. Transformer appears to be connected to main distribution grid
(Photo courtesy of the USACE)**

Installation of the Main Distribution Panel and the cabling to connect the facility to the main distribution grid

The SOW required the contractor to install the Main Distribution Panel to connect the facility to the generator and the main distribution grid, including supplying and installing the necessary cabling. GRD contract file documentation indicates that the contractor did not connect the facility to the main distribution grid.

Installation/construction of service building, consisting of a guard/operator's room, kitchen, and bathroom

The SOW required the construction of a service building, consisting of a 4.5 x 5 m guard/operator's room, kitchen, and bathroom.

According to GRC documentation, the contractor was paid 100 percent for the construction of this facility.

Several of the daily QC reports provided photographic verification of the construction of the facility (Site Photos 8 and 9).

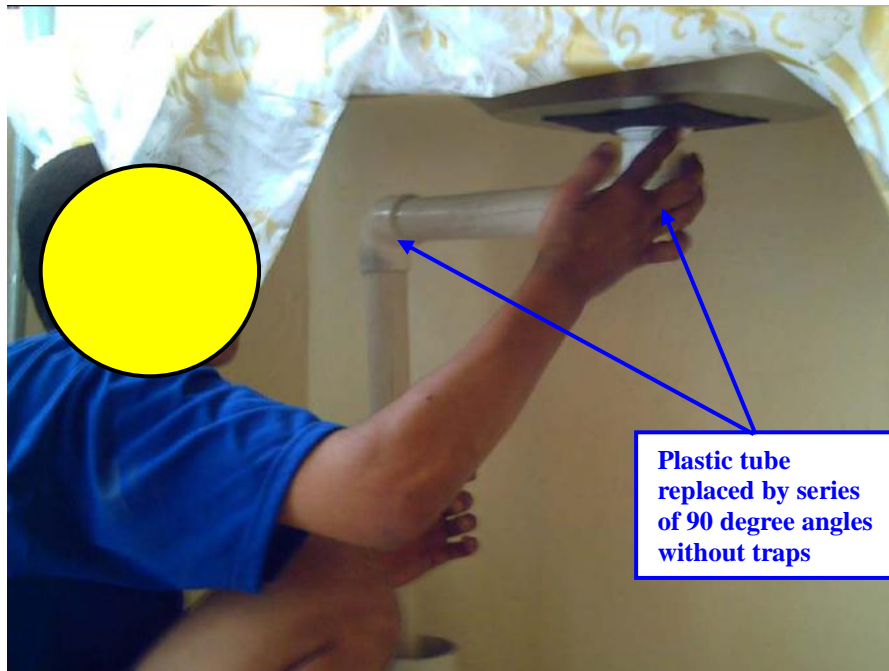


Site Photos 8 and 9. In-progress construction photos of the service building (Photos courtesy of the USACE)

The USACE's April 2007 site visit identified deficiencies within the service building, such as the use of "old" doors and windows and "poor sanitary work" (Site Photos 10 and 11). A subsequent daily QC report confirmed these deficiencies were addressed. However, in some cases, the "fix" did not address the root cause. For example, the contractor created a drain for the sink in the ground far too large and connected it through the use of a plastic tube. The contractor "corrected" the problem by using PVC pipe with two 90 degree angles to connect to the previously created drain (Site Photo 12). The contractor did not use traps, which provide access for cleaning the pipes and prevent odors from the waste pipe from entering the room. In addition, the contractor's fix did not address the large floor drain pipe extending from the floor. Finally, the quality of parts used, such as the sink did not appear suitable for use as a kitchen sink.



Site Photos 10 and 11. Examples of poor construction techniques by the contractor (Photos courtesy of the USACE)



Site Photo 12. Attempt by contractor to “correct” plastic tube problem
(Photo courtesy of the USACE)

Project Quality Management

Contractor’s Quality Control Program

Department of the Army Engineering Regulation (ER) 1180-1-6, dated 30 September 1995, provides general policy and guidance for establishing quality management procedures in the execution of construction contracts. According to ER 1180-1-6, “...obtaining quality construction is a combined responsibility of the construction contractor and the government.”

The SOW for the Al Ghazaliyah G-6 sewage lift station project required the contractor to “establish and maintain an effective quality control program to ensure the requirements of the contract are provided as specified.” This required the contractor to describe “...procedures for tracking preparatory, initial, and follow-up control phases for construction and control, verification, and acceptance tests including documentation.” In addition, the contractor needed procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures establish verification to identify that deficiencies have been corrected. Further, the “...QC Plan shall be implemented by an assigned person with Contractor’s organization who shall be cognizant of and assure that all documents have been coordinated. This individual shall be a person who has verifiable engineering experience and is a registered professional engineer.”

The contractor developed a QC plan, which established procedures for the inspection, surveillance, audit, and testing for the construction of the project.

GRC provided us with 37 daily QC reports for the G-6 project. The daily reports covered the time period of December 2006 through May 2007. The daily QC reports contained

information such as the number of workers on site each day, the work activities performed, and the total completion percentage.

SIGIR reviewed the GRC provided daily QC reports and found them inadequate. The quality control representative (QCR) monitored field activities and completed daily QC reports. However, the daily QC reports did not include sufficiently complete daily observations of what occurred at the site, problems encountered at the site that required corrective actions, or solutions achieved to correct site problems. For example, each daily QC report was vague when describing work accomplished (“ongoing building the room”). Further, not a single daily QC report identified a construction deficiency or an international code violated at the Al Ghazaliyah G-6 sewage lift station. In addition, even if the QCR identified a construction deficiency or international code violation, the daily QC reports did not have a section to document it.

The daily QC reports did not contain any test and/or inspection results, nor did they have a section to discuss any testing and/or test results for this project. Therefore, there is no certainty that either the generator or the submersible pump was ever tested.

Finally, no QC deficiency log existed for this project. Deficiency logs are important to document identified deficiencies and the corrective actions taken to correct each deficiency. Without a QC deficiency log, it is unknown what, if any, deficiencies were caught and if so whether they were corrected.

Government Quality Assurance Program

USACE ER 1110-1-12 and the Project and Contracting Office (PCO) Standard Operating Procedure (SOP) CN-100 specified requirements for a government QA program. Specifically, PCO SOP CN-100 provides guidance for the USACE’s GRD staffs to “...ascertain if the contractor quality control (CQC) (sic) system is functioning and the specified level of construction quality is being attained.”

The U.S. government quality assurance program suffered from the deteriorated security situation in the area. GRD provided us with 11 daily QA reports, which covered the time frame from November to December 2006. Of the 11 daily QA reports, six reported no work performed on the day of the visit. The daily QA reports were vague regarding the work performed (“...House Keeping...”) and provided little insight into any problems encountered at the site.

Project Sustainability

Sustainability was addressed in the contract and delivery order requirements. The contract’s “Warranty Management” clause required the contractor to provide a one-year overall warranty of construction; the delivery order required the contractor to provide all operations and maintenance manuals and all certified warranties. To maintain continuous use of the on-site generators, the delivery order provided that the sewage lift station be furnished with a six-month fuel supply.

Conclusions

Based upon the results of our contract file review and interviews with key project personnel, SIGIR reached the following conclusions for our assessment objectives. Appendix A provides details pertaining to Scope and Methodology.

1. The contract file did not contain documentation of component design. The contract's Statement of Work required the contractor to prepare architectural, structural, mechanical, plumbing, and electrical designs; the Bill of Quantity required the contractor to inspect and report on the cover pumps, valves, lines, manholes, controls, generators, and distribution panels. The required design submittals from the contractor—such as schematic diagrams identifying the flow of sewer water entering and exiting the Al Ghazaliyah G-6 and throughout the Al Ghazaliyah area—were not included in the contract file. In addition, no diagrams providing clarity on the location and function of specific pieces of equipment were included.
2. Because inspectors were unable to visit the Al Ghazaliyah G-6 sewage lift station, SIGIR based the assessment of work quality on contract file documentation. The contract file documented that the United States Army Corps of Engineers conducted an inspection in April 2007, which found incomplete work done by the contractor. For example, one submersible pump was not connected to the generator or national power grid, and the piping connection was not completed, the ampere meter for the generator was not working, and poor quality work was noted in the service building. The United States Corps of Engineers brought these deficiencies to the attention of the contractor.
3. The contractor's quality control plan was sufficiently detailed, including the use of daily quality control reports to document construction deficiencies; but contract file documentation indicated that the contractor's quality control program implementation did not identify any significant construction deficiencies, such as potentially dangerous electrical installation practices. Further, there was no quality control deficiency log for this project.

The United States government quality assurance program suffered from the deteriorated security situation in the area. According to United States Army Corps of Engineers documentation, only 11 daily quality assurance reports exist for this project; the last daily quality assurance report was issued in December 2006.

4. The contract and delivery order requirements addressed sustainability. The contract's "Warranty Management" clause required the contractor to provide a one-year overall warranty of construction; the delivery order required the contractor to provide all operations and maintenance manuals and all certified warranties. To maintain continuous use of the onsite generators, the delivery order provided that the sewage lift station be furnished with a six-month fuel supply.
5. As noted, the contract was terminated because the deteriorated security situation in the area prohibited the contractor from completing work. Consequently, the Al Ghazaliyah G-6 sewage lift station renovation and construction project results were not consistent with the original objectives of the delivery order. The delivery order Statement of Work required the contractor to "provide a complete and useable facility upon the conclusion of construction...." When the contract was terminated, the Al Ghazaliyah G-6 facility was not operational. Contract file documentation shows that the facility was not connected to the main distribution grid.

Assumption of Responsibility by the Government of Iraq. The Joint Reconstruction Operations Center was created to coordinate and synchronize Baghdad reconstruction

efforts. The Joint Reconstruction Operations Center comprises representatives from Multi-National Forces - Iraq, Multi-National Corps - Iraq, Multi-National Division - Baghdad, U.S. Department of State, Provincial Reconstruction Team – Baghdad, United States Agency for International Development, Government of Iraq, and United States Army Corps of Engineers - Gulf Region Division.

Each organization provides data to the Joint Reconstruction Operations Center; which then "presents a unified voice" to the Joint Planning Commission. The Joint Planning Commission decides on service projects for targeted areas. Under this process, the Amanat (Baghdad city government) has assumed responsibility for a number of sewage projects in Baghdad, including the Al Ghazaliyah G-6 sewage lift station.

Recommendations and Management Comments

In view of the current security situation in the Al Ghazaliyah area and the assumption of responsibility for a number of sewage projects in Baghdad including the Al Ghazaliyah G-6 sewage lift station by the Amanat, this report does not contain recommendations for corrective action. Therefore, management comments were not required. However, we received comments on a draft of this report from the Gulf Region Division of the United States Army Corps of Engineers which generally agreed with the facts and figures reported and offered no additional comments. The complete text of the Gulf Region Division comments are in Appendix D.

Appendix A. Scope and Methodology

SIGIR performed this project assessment from November 2007 through April 2008 in accordance with the Quality Standards for Inspections issued by the President's Council on Integrity and Efficiency. The assessment team included an engineer/inspector and two auditors/inspectors.

The objective of this project assessment was to provide real-time relief and reconstruction project information on the repair of the Al Ghazaliyah G-6 and G-7 sewage lift stations in Baghdad, Iraq to interested parties to enable appropriate action to be taken, when warranted. Previously, the U.S. Army was able to escort us to the Al Ghazaliyah G-7 Sewage Lift Station and the results were provided in a separate assessment³. Due to insurgent activity in the area of the Al Ghazaliyah G-6 station, both the U.S. Army and private security contractor denied the assessment team's repeated requests for escorts to inspect the site. Consequently, this assessment relied solely upon information obtained from the contract file and aerial imagery.

In performing this Project Assessment SIGIR:

- Reviewed contract documentation to include the Contract, Contract documentation, Bill of Quantity, and Statements of Work; and
- Reviewed the design package (drawings and specifications), quality control reports, quality assurance reports, construction progress photos, final situation report, and invoices.

³ See SIGIR Assessment Report No. PA-07-118, "Repair of the Al Ghazaliyah G-7 Sewage Lift Station," 25 January 2008.

Appendix B. Acronyms

BOQ	Bill of Quantities
CQC	Contractor quality control
DO	Delivery Order
ER	Engineering Regulation
GRC	Gulf Region Central of the Gulf Region Division
GRD	Gulf Region Division of the United States Army Corps of Engineers
IBC	International Building Code
IEBC	International Existing Building Code
IEC	International Electric Technical Commission
IMC	International Mechanical Code
IPC	International Plumbing Code
ISO	International Standards Organization
kVA	kilo-Volt Amp
m	Meter
mm	Millimeter
NFPA	National Fire Protection Association
PCO	Project and Contracting Office
QA	Quality Assurance
QC	Quality Control
QCR	Quality Control Representative
SIGIR	Special Inspector General for Iraq Reconstruction
SMACNA	Sheet Metal and Air Conditioning Contractor's National Association
SOP	Standard Operating Procedure
SOW	Statement of Work
USACE	United States Army Corps of Engineers

Appendix C. 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 for Peace

Congressional Committees and Subcommittees, Chairman and Ranking Minority Member

U.S. Senate

Senate Committee on Appropriations
 Subcommittee on Defense
 Subcommittee on State, Foreign Operations, and Related Programs
Senate Committee on Armed Services
Senate Committee on Foreign Relations
 Subcommittee on International Development and Foreign Assistance, Economic Affairs, and International Environmental Protection
 Subcommittee on International Operations and Organizations, Democracy and Human Rights
 Subcommittee on Near Eastern and South and Central Asian Affairs
Senate Committee on Homeland Security and Governmental Affairs
 Subcommittee on Federal Financial Management, Government Information, Federal Services, and International Security
 Subcommittee on Oversight of Government Management, the Federal Workforce, and the District of Columbia
Permanent Subcommittee on Investigations

U.S. House of Representatives

House Committee on Appropriations
 Subcommittee on Defense
 Subcommittee on State, Foreign Operations, and Related Programs
House Committee on Armed Services
 Subcommittee on Oversight and Investigations
House Committee on Oversight and Government Reform
 Subcommittee on Government Management, Organization, and Procurement
 Subcommittee on National Security and Foreign Affairs
House Committee on Foreign Affairs
 Subcommittee on International Organizations, Human Rights, and Oversight
 Subcommittee on the Middle East and South Asia

Appendix D. Gulf Region Division Comments

**COMMAND REPLY
to
SIGIR Draft Assessment Report
Repair of the Al Ghazaliyah G-6 Sewage Lift Station
Under the Commander's Emergency Response Program
SIGIR Report No. PA-07-118.1**

GRD reviewed the report and has no additional comments.

Appendix E. 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

Charles Comeau

Kevin O'Connor