

**ORPHANAGE AND SENIOR CITIZEN  
ASSISTED LIVING CENTER  
ERBIL, IRAQ**

**SUSTAINMENT ASSESSMENT**

**SIGIR PA-09-178  
OCTOBER 21, 2009**

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# SIGIR

Special Inspector General for IRAQ Reconstruction

October 21, 2009

## Orphanage and Senior Assisted Living Center

### Summary of Report: PA-09-178

### 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 this project is operating at the capacity stated in the original contract. To accomplish the objective, the assessment team 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

This report contains no recommendations for corrective action.

Although management comments were not required, SIGIR received comments from the Gulf Region Division of the U.S. Army Corps of Engineers concurring with the draft report.

SIGIR appreciates the concurrence with the draft report. No additional comments are necessary.

### What SIGIR Found

On 9 July 2009, SIGIR conducted an on-site assessment of the Orphanage and Senior Citizen Assisted Living Center in Erbil, Iraq. During the site visit, SIGIR was accompanied by the Erbil Resident Office Project Engineer, Kurdish Regional Government Ministry personnel, and the Orphanage and Senior Citizen Assisted Living Center facility staff.

The objective of the project was to provide a modern, safe, and comfortable facility for the most vulnerable citizens of Erbil, Iraq. Valued at approximately \$3.7 million, this Economic Support Fund project will result in the first-of-its-kind facility with a combined orphanage and senior center. The project showcases the government's ability to address the basic needs of the population, providing a safe home for 345 children (165 males and 180 females) and 60 senior citizens. The project will result in a living center benefiting destitute orphans and senior citizens by providing a safe and clean living environment.

SIGIR's review of the design documentation, provided by GRN, determined that the initial design and construction of the project appeared adequate. However, during the site visit, SIGIR identified a number of potential safety concerns. Specifically, the primary circuit-breaker panels in the children's dormitories had no protective cover over the unused panel circuits; no warning signs were posted regarding high shock risk in the transformer and generator building; there was unrestricted access to the water tower; and the transformer room was not secured against unauthorized access.

These concerns were corrected before the preparation of this report. SIGIR concluded that the construction of the facility was adequate; aside from the minor safety concerns noted, the project was operating at the capacity provided for in the contract. At the time of the site visit, the Orphanage and Senior Citizen Assisted Living Center had been operational for approximately five months.





## **SPECIAL INSPECTOR GENERAL FOR IRAQ RECONSTRUCTION**

October 21, 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 Sustainment Assessment of the Orphanage and Senior Citizen  
Assisted Living Center, Erbil, Iraq (SIGIR Report Number PA-09-178)

We are providing this report for your information and use. It addresses the current status of the Orphanage and Senior Citizen Assisted Living Center in Erbil, Iraq. This assessment was made to provide you and other interested parties with real-time information on a relief and reconstruction project and to determine whether the project was operating at the capacity stated in the original contract.

This report contains no recommendations for corrective action. Although management comments were not required, SIGIR received comments from the Gulf Region Division of the U.S. Army Corps of Engineers concurring with the draft report. SIGIR appreciates the concurrence with the draft report. No additional comments are necessary.

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](mailto: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](mailto:publicaffairs@sigir.mil) or at 703-428-1100.

A handwritten signature in black ink, which appears to read "Stuart Bowen, Jr.", is positioned above the printed name.

Stuart W. Bowen, Jr.  
Inspector General

# **Special Inspector General for Iraq Reconstruction**

**SIGIR-PA-09-178**

**October 21, 2009**

## **Orphanage and Senior Citizen Assisted Living Center Erbil, Iraq**

### **Synopsis**

**Introduction.** The Office of the Special Inspector General for Iraq Reconstruction (SIGIR) is assessing projects funded under the Economic Support Fund to provide real-time information on relief and reconstruction projects 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 9 July 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 two engineers/inspectors.

**Project Objective.** The objective of the project was to provide a modern, safe, and comfortable facility for the most vulnerable citizens of Erbil, Iraq. Valued at approximately \$3.7 million, the project will result in the first-of-its-kind facility with a combined orphanage and senior center. The project showcases the government's ability to address the basic needs of the population, while providing a safe home for 345 children (165 boys and 180 girls) and 60 senior citizens. The project will result in a living center benefiting destitute orphans and senior citizens by providing a safe and clean living environment.

The project consisted of an administrative building, a multi-purpose hall, a girls' residential house, a boys' residential house, a senior citizens' residential house, play areas, a pool, a guard house, a water tank, a garden, a fence, drive and walk ways, a parking area, and other support buildings.

**Conclusions.** On 7 February 2009, the Gulf Region North (GRN) Erbil Resident Office officially turned over the Orphanage and Senior Citizen Assisted Living Center project to the Director of the Ministry of Social Affairs, Erbil Governorate. The Certificate of Deliverables document noted that the director received the operation and maintenance manuals, as-built drawings, and the warranty documents.

According to GRN documentation, authorized GRN Erbil Resident Office personnel conducted pre-final inspections on 27 December 2008 and 15 January 2009. The pre-final inspections noted minor problems for the contractor to correct in the buildings. The final inspections for the buildings commenced on 28 December 2008 and were finalized on 23 January 2009. The final inspections showed that the work required by the contract was accomplished without any noted deficiencies.

On 9 July 2009, SIGIR conducted an on-site assessment of the project. During the site visit, SIGIR was accompanied by the Project Engineer of the GRN Erbil Resident Office, personnel of the Kurdish Regional Ministry, and staff of the Orphanage and Senior Citizen Assisted Living Center. During the site visit, the Orphanage and Senior Citizen Assisted Living Center was occupied and functioning.

Before the site visit, SIGIR reviewed the GRN-provided conceptual drawings that were provided to the contractor, which included the architectural layout and building designs. SIGIR also reviewed contractor-generated drawings which contained specific information regarding the structural details, building mechanical systems, site utilities, site drainage, sewage collection system, and other project features. Based on the detailed Statement of Work and the inclusion by reference of other applicable codes and standards, adequate information was provided in the specifications for the contractor to complete the final design and construct the facility. In addition, the contractor provided detailed final design drawings and plans that contained specific information for the construction of the Orphanage and Senior Citizen Assisted Living Center.

Although the contract did not require a geotechnical report, the contractor supplied a geotechnical report, which was prepared by a local construction laboratory. The report contained information on the borings, physical and chemical properties of the soil, and the allowable soil-bearing capacity.

SIGIR's review of the design documentation determined that the initial design and construction of the project appeared adequate. A number of potential safety concerns were identified during the site inspection, but they were rectified prior to the preparation of this report.

SIGIR concluded that the construction of the facility was adequate; aside from the minor safety concerns noted, the project was operating at the capacity provided for in the contract. At the time of the site visit, the Orphanage and Senior Citizen Assisted Living Center had been operational for approximately five months.

**Recommendations.** This report contains no recommendations for corrective action. Therefore, management comments were not required.

**Management Comments.** Although management comments were not required, SIGIR received comments from the Gulf Region Division of the U.S. Army Corps of Engineers concurring with the draft report.

**Evaluation of Management Comments.** SIGIR appreciates Gulf Region Division concurrence with the report.

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# **Introduction**

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## **Objective of the Project Assessment**

The objective of this project assessment was to provide real-time information on relief and reconstruction 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 the project was operating at the capacity stated in the original contract. To accomplish this, SIGIR determined if the project was at full capability or capacity when accepted by the U.S. government, when it was transferred to Iraqi operators, and during the site inspection.

## **Pre-Site Assessment Background**

### **Contract, Costs and Payments**

On 29 August 2007, the Gulf Region Division – Northern District (GRN) awarded contract W917BE-07-C-0088, a firm-fixed-price-contract for \$3,645,000 to a local contractor. The contract's period of performance was 350 days after receiving the Notice to Proceed.

There were four modifications to the contract.

- Modification P00001, dated 4 September 2007, added the liquidated damages clause to the contract, which was inadvertently omitted from the solicitation award.
- Modification P00002, dated 23 July 2008, added the construction of a laundry facility to the project. The total cost of the contract increased by \$80,000 from \$3,645,000 to \$3,725,000.
- Modification P00003, dated 17 August 2008, extended the period of performance to 30 November 2008 due to excusable delays with no additional cost to contract.
- Modification P00004, dated 1 December 2008, changed the Statement of Work (SOW) for contract and extended the contract completion date.

### **Project Objective and Pre-Construction Description**

Based on the SOW, the project objective consisted of constructing a modern, safe, and comfortable new complex that includes an administrative building, multi-purpose hall, car parking area, residential houses for 345 children (165 boys and 180 girls) and 60 senior citizens, a guard house, a play yard, a water tank, a garden, a fence, and drive and walk ways.

According to the GRN project file information and the facility manager, the project was located at the site of the original orphanage in downtown Erbil, Iraq. The project involved the demolition of the original orphanage, which the facility manager described as “like a prison”, and construction of the new first, of its kind, complex with a combined orphanage and senior center to benefit destitute orphans and senior citizens by providing a safe and clean living environment. The quality assurance

(QA) report on 22 October 2007 shows the original orphanage building in disrepair (Site Photo 1).



**Site Photo 1. Pre-construction orphanage building site (Courtesy of the USACE)**

### **Statement of Work**

The SOW for this project consisted of design requirements and the conceptual drawings, which contained enough information to convey the scope and intent of the Orphanage and Senior Citizen Assisted Living Center project. Specifically:

- leveling and grading the project site
- design and construction of the sewage and rain water draining utilities to drain the water to the outside of the compound
- design and construction of the electrical works for the buildings and the distribution system by underground feeder between the buildings and the electrical building
- design and construction of the drive and walk ways between the buildings
- design and construction of the electrical building for the generator and transformer buildings
- design and construction of the perimeter fence and two main gates
- design and construction of the exterior electrical lighting poles covering the compound area
- design and construction of the administration building, which included the offices, barber room, computer room, doctor's room, and any other room specified in the conceptual drawings
- design and construction of the residential buildings
- design and construction of the multi-purpose hall, which included the conference room, dining hall, library, computer room and recreation areas, sports room, and music and drawing halls
- design and construction of the kitchen building that serviced the main dining hall and the residential buildings

- construction of the car parking area and guard house
- design and construction of the elevated water tank

The requirements to complete this project provided sufficient detail for the construction of the Orphanage and Senior Citizen Assisted Living Center.

### **Current Project Design and Specifications**

The contract stated that the government was to provide the contractor a set of conceptual drawings and specifications. The contractor was to check and compare the drawings, verify the figures, notify the contracting officer of any discrepancies, and be responsible for any errors. Further, the contract stated that the contractor was to provide detailed 100% project design drawings, in addition to the as-built drawings, to GRN.

The SOW required the contractor to design, construct, and install equipment, materials, and works in compliance with the Iraqi General Technical Specifications (IGTS) and the International Building Code (IBC). The resident engineer was to approve any change from the IGTS. Further, the SOW required conformity to the following codes and standards for the design and construction specific to each trade and category:

- International Existing Building Code
- International Mechanical Code
- International Electromechanical Commission
- International Plumbing Code
- International Fire Code
- National Fire Prevention Agency
- Sheet Metal and Air Conditioning Contractor's National Society
- Underwriter's Laboratories
- American Society for Testing and Materials
- American Society of Mechanical Engineers
- American Society of Heating, Refrigerating, and Air Conditioning Engineers 52

The contract included conceptual drawings for the project. The government furnished conceptual drawings included a general site plan with building locations and the parking layout. The contractor provided a detailed site plan depicting the specific locations of the administrative, multi-purpose hall, girls' residential house, boys' residential house, senior citizens' residential house, the parking, and other support buildings (Figure 1).



Figure 1. General site plan (Courtesy of the USACE)

The contractor-furnished site plan appeared well-planned and maximized the use of the limited space available. Landscaping and walkways were indicated on the site plan; the walkways provided good internal circulation around the buildings, and the landscape provided a buffer from the main and side streets, allowing the residents some privacy.

The parking area provided a separate ingress and egress from the main street into the facility and included a secondary entrance, located on the side street, for service vehicles. Attention was paid to site security; the guardhouse was situated near the primary entrance access, which is located before the parking area, and limits access to unauthorized persons and/or vehicles from entering the residential area of the project.

The separate entrance for service vehicles was located off of the existing side street.

### Geotechnical Report

Although the contract did not require a geotechnical report, the contractor supplied one that was prepared by a local construction laboratory. The report contained information on the borings, physical and chemical properties of the soil, and the allowable soil bearing capacity.

The report permitted the contractor the use of shallow spread footings for the foundation system with a minimum depth of two meters for the buildings. According to the geotechnical report, a shear and settlement analysis was performed for the site soils. The results of the analysis yielded an allowable bearing pressure of 180 kilo-newtons<sup>1</sup> per square meter for the footings with settlement being the controlling factor.

### Building Foundation

The contractor submitted foundation details for the administration building, multi-purpose hall, residential houses, the power system, and water system buildings. The proposed foundation for the structures consisted of shallow spread footings.

The foundation design for the administration, multi-purpose, and house buildings do not appear consistent with the findings of the geotechnical report. The footings indicated on the foundation details were shown at a depth of 1.15 meters below the existing grade, while the geotechnical report required a depth of 2.0 meters below existing grade. The reasons cited in the geotechnical report for the 2.0 meter depth include: protection against “*seasonal climatic changes*” and “*to penetrate the undesirable top soil*”. Additional information provided by the GRN local engineer showed that a significant portion of earth was removed from the site prior to excavation for the foundation. The combination of the site excavation and the excavation for the foundation appeared consistent with the recommendation of the geotechnical report.

### Reinforced Concrete Framing

The administration and multi-purpose building framing details and reinforced concrete slab plans were included with the project information provided by GRN. The framing details included information for constructing the reinforced concrete beams and included the overall beam dimensions and reinforcing quantity, size, and location.

The beam details were designated on the plan by beam mark numbers. Mark numbers are typically used to correlate the details to the location on the framing plan. Mark numbers were evident on the slab detail sheets and corresponded to the appropriate details. The reinforced concrete framing generally appeared designed to carry the anticipated loads. The beams appear to be sized for gravity loads and have a typical configuration.

The reinforced concrete slab plans contained significant detail regarding the slab thickness, configuration, and reinforcement. The plans indicated overall slab dimensions including edge contour and interior slab penetrations. Slab thickness

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<sup>1</sup> The newton is the unit of force derived in the international system of units; it is equal to the amount of force required to accelerate a mass of one kilogram at a rate of one meter per second per second.

was indicated as uniform for the entire floor, which provided a simple design without the need for complex formwork. The reinforcement was detailed on the drawings.

The residential houses contained concrete masonry unit (CMU)<sup>2</sup> walls and reinforced concrete slab plans, which were included with the project information provided by GRN. There was limited use of reinforced concrete beams in the residential houses because the design relies heavily on interior load-bearing walls, which preclude the need for a large number of beams.

The interior walls were shown on the plans as a single layer of CMU. No reinforcing was indicated on the plans for the interior walls. Due to the lack of reinforcing, the interior walls will have limited capacity to resist horizontal loads, either in or out of plane.

### Architectural Plans

The documentation provided by GRN included detailed architectural floor plans, building sections, and elevation views. The floor plans included information on room use, floor dimensions, room finishes and door/window schedules. The floor plans were well designed and complete. The administration and multi-purpose building elevations and building sections were provided and indicated details for construction.

The senior citizen's residential house was planned to accommodate physically challenged accessibility. The senior citizen's residential house included a ramped entrance and a motion activated automatic door. The interior of the facility provided access to all floors via an elevator. A secondary means of access to all floors above the first floor was a stairwell configured around the elevator shaft.

SIGIR did identify a design limitation in the fire and panic egress from the senior citizen's and children's residential houses. The senior citizen's stairwell was not isolated from the rest of the structure, which permits the transfer of smoke between floors. There does not appear to be a safe haven for individuals near the stairwell. In the event of a fire, the elevators should not be in use and a protected, fire-rated area should be provided for immobile persons to wait for rescue personnel. Also, the children's residential houses contained a central staircase, which was the only means of egress from the upper floors of the structure. In the event that the staircase becomes blocked, there was no alternate means of egress.

### Utilities and Physical Plant - Plumbing

The contractor provided detailed plans for the water supply and sanitary sewer plumbing for the project. The plans convey pipe sizes, fixture locations, tie-in points, vent stacks, and other details required to plumb the facility. The utilities were appropriately sized for the project. The occupant load of the facility was not provided; however, based on IBC requirements for office buildings, it appeared that more than an adequate number of fixtures were provided.

The occupant load of the senior citizen's residential house was not provided; however, based on the number of rooms and the anticipated number of occupants per room, the total number of occupants per floor was estimated to be between 12 and 18

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<sup>2</sup> A CMU which is a large rectangular brick used in construction is also referred to as a concrete block, cement block, or foundation block.

for the senior citizen's residential house. Based on IBC requirements for assisted living residential facilities, the number of fixtures required was one toilet for every 10 persons, both male and female. With the actual number of toilets provided being four per floor, the ratio provided was one toilet for every three to four occupants and was adequate.

For the children's residential houses, the anticipated number of occupants per floor was estimated to be between four and six. Based on IBC requirements for residential houses, the number of fixtures required was one toilet for every 10 persons, both male and female. With the actual number of toilets provided being two per floor, the ratio provided was one toilet for every two to three occupants and was adequate.

Based on the plans provided, the contractor proposed to split the plumbing systems for both the administration and multi-purpose buildings into two separate systems at each building. The plans indicated two independent water supplies, two independent sewer connections, and two septic tanks at both locations. The design provided some redundancy if there was an interruption of service at either location.

For the administration building, it is unclear why the contractor did not provide a cross connection with shutoff valves between the two water systems. The cross connection could supply water to both ends of the facility in the event of an issue with one of the exterior supply lines, and shutoffs would permit isolation of either system for maintenance or repair. For the multi-purpose building, because of the configuration of the restrooms and the distance across the building, the decision not to tie the two systems together appeared reasonable.

The provided plumbing plans indicated that the greywater<sup>3</sup> for the residential houses was collected and discharged to a larger greywater system and used for landscape irrigation. The septic sewage was collected and conveyed to septic tanks for holding and pumping. This system promoted water conservation by using the greywater near the point of generation.

#### Utilities and Physical Plant - Electrical

For the administrative, multi-purpose, and residential house buildings, the contractor provided detailed electrical plans. The electrical plans indicated the anticipated loading, wire routes, fixtures, panels, receptacles, and other detailed information. The electrical system anticipated the proposed uses and provided lighting and power commensurate with the facility.

The contractor provided load tables<sup>4</sup> to verify the anticipated electrical loading. The load tables included breaker size and power demand for all items anticipated in the administration and multi-purpose buildings. In addition to the load tables, the contractor provided design drawings indicating the wiring layout for the receptacles, lighting, water heaters, and air conditioners. The wiring appeared routed in a logical and concise manner.

Conduit was specified on the drawings as galvanized steel, which was consistent with the National Electric Code and exceeded the requirements of the contract for polyvinyl chloride conduit.

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<sup>3</sup> Greywater consists of all residential wastewater generated from domestic processes such as dish washing, laundry and bathing

<sup>4</sup> Load tables enable the user to determine the actual uniform and/or concentrated load carrying capacity.

### Utilities and Physical Plant - HVAC

Design of the heating, ventilation, and air conditioning (HVAC) systems for the administration building and the multi-purpose building follow a similar configuration. The contractor provided detailed HVAC plans for both buildings with the contract submittals. The drawings provided detailed information regarding the location of the HVAC units and the proposed connection lines. However, line size and location of the compressor units were not shown on the drawings. The drawings indicated that split units were dispersed throughout the buildings, which eliminated the need for ducting in the facility. However, the proposed split units greatly reduced air turnover and could result in decreased indoor air quality.

There was no HVAC indicated for the central rotunda of the administration building or multi-purpose building. Instead the buildings rely on load sharing between individual units to control these areas.

For the other portions of the multi-purpose building, the contractor provided HVAC plans that show two types of air-conditioning units. One type of unit was a split-HVAC unit. The power connections were indicated on the plans for these units. However, SIGIR could not determine from the plans how the second type of HVAC units were powered or where the compressor units were located.

For the senior citizen's and children's residential houses, the contractor provided HVAC plans that contained some detail regarding the location of the units. Power connections were indicated on the plans for these units. The location of the roof mounted portion of the units was not shown on the plans.

The HVAC drawings indicated that the units were dispersed throughout the building, which eliminated the need for ducting in the buildings. Due to the residential use of the buildings and the limited number of occupants, this appeared to be a reasonable design for the residential houses.

### Water System

The project required the construction of a water distribution system for the facility. The system was comprised of a centralized pump house, elevated storage tank, and distribution piping. The contractor provided drawings for the elevated storage tank and pump room. Design drawings for the distribution network were not provided with the project documentation; however, as-built drawings were included.

The proposed elevated storage tank was a 21,000-liter cylindrical steel storage tank atop a 14 meter high reinforced concrete frame tower. The tank was provided with a top hatch for personnel access; a warning light for aircraft; and fill and discharge piping, with a bypass to completely drain the tank for maintenance.

The fill and discharge piping, along with the access ladder, were shown on the plans as attached to the exterior of the tower. The method of attachment was not detailed. The proposed material for the piping and access ladder appeared to be steel. The weight of these components may be considerable and attention should be given to the method of attachment to the tower.

Outlet pipe was shown vented to the atmosphere. Calculations were not provided; therefore, SIGIR could not determine if the vent system had adequate capacity to equalize pressure in the tank. Based on the design drawings, it does not appear that the water tank was designed as a pressure vessel and adequate ventilation should be provided. No return or cap was shown on the vent pipe, and provisions should be made to protect the vent piping from contamination with debris or entry of vectors.

Based on information provided by GRN, the water supply pump was not included in the Scope of Work and is not included in this contract. It is unknown what type or size of pump was present or if backflow preventers, check valves, or other required equipment was included to prevent issues with the connection to the municipal system.

### Power System

GRN provided project documentation that included information on the power distribution and a backup generator system for the orphanage and senior citizen living center project. The information included line diagrams of the circuits, and architectural drawings of the generator building. No information was provided with the project documentation for the generator, transformer, and switchgear.

The layout of the power supply appeared well-planned. Based on the load tables, the backup generator capacity appeared to match the demands of the facility.

The contract documents included requirements for a design/build project with sufficient detail for the contractor to design the facility. GRN provided conceptual drawings to the contractor that included the architectural layout and building designs. Contractor-generated drawings contained specific information regarding the structural details, building mechanical systems, site utilities, site drainage, sewage collection system, and other project features. Based on the detailed SOW and the inclusion by reference of other applicable codes and standards, there was adequate information provided in the specifications for the contractor to complete the final design and construct the facility. In addition, the contractor provided detailed final design drawings and plans that contained specific information for the construction of the Orphanage and Senior Citizen Assisted Living Center project.

## **Site Progress During Construction**

The contract stated that the contractor was to perform quality control (QC) throughout the duration of design, construction, installation, testing, and commissioning. Throughout the project's construction, the contractor provided a construction log that documented QC, including photographs and work activities performed. In addition, the GRN Erbil Resident Office documented construction progress via QA 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 Director of the Ministry of Social Affairs (MOSA), Erbil Governorate on 7 February 2009.

Before the contractor could begin the new construction, the existing buildings were demolished and the contractor cleared, outlined, and leveled the project site (Site Photo 2). The contractor and QA representative measured the foundation of the building to confirm the thickness of the foundation. Site Photo 3 shows the form work completed for the administrative building.



**Site Photo 2. Layout of project site (Courtesy of the USACE)**



**Site Photo 3. Administrative building -- rebar and form work (Courtesy of the USACE)**

## **Condition at Turnover**

The contract stated that the government was to perform a pre-final inspection of the project. After the contractor completed the pre-final punch list of items noted during the pre-final inspection, the contractor and the government would perform a final acceptance inspection.

According to GRN documentation, GRN Erbil Resident Office personnel conducted a pre-final inspection on 27 December 2008 for the senior citizens', girls' and boys' dormitories. On 15 January 2009, GRN Erbil Resident Office personnel conducted the pre-final inspection for the administration building. The pre-final inspections noted minor problems for the contractor to correct.

GRN Erbil Resident Office personnel conducted separate final inspections on the individual buildings. The final inspection was conducted for the laundry and guard house buildings on 28 December 2008; the multi-purpose building on 29 December 2008; the senior citizens', boys', and girls' dormitories on 20 January 2009; and the administrative building on 23 January 2009. The final inspections showed that the work required by the contract was accomplished without any noted deficiencies.

On 7 February 2009, the GRN Erbil Resident Office officially turned over the Orphanage and Senior Citizen Assisted Living Center project to the Director of Ministry, MOSA, Erbil Governorate. The Certificate of Deliverables document noted that the Director of Ministry, MOSA, Erbil Governorate received the operation and maintenance manuals, as-built drawings, and the warranty documents.

## Site Assessment

On 9 July 2009, SIGIR performed an on-site assessment of the Erbil Orphanage and Senior Citizen Assisted Living Center. During the site visit, SIGIR was accompanied by the GRN Erbil Resident Office Project Engineer; the Kurdish Regional Ministry personnel; and the Orphanage and Senior Citizen Assisted Living Center facility staff. SIGIR was permitted approximately 2 hours for the project site visit. Therefore, SIGIR performed a representative assessment of the project work completed.

### Exterior Guard House

The Orphanage and Senior Citizen Assisted Living Center facility was surrounded by a perimeter security fence. The fence was of CMU construction and topped with a decorative steel fence. At the main entrance of the facility, a guard house and gate were constructed to control access to the residential areas of the facility.

The project included parking with sunshades for multiple vehicles. The parking area was well planned and was adequate for staff parking. There was limited parking for visitors and guests, although on-street parking was available.

### Administration Building

The administration building was situated at the end of the compound closest to the main street and acted as an effective screen for the residential portion of the facility. The administration building was a large three-story modern structure with a glass and aluminum facade (Site Photo 4).

The building was configured around a central rotunda with two wings. The exterior of the administration building consisted of composite aluminum panels with a prominent glass facade. The workmanship of the building's exterior appeared satisfactory.

The central rotunda contains the main stairwells for access to all levels of the building. At each level a balcony was situated to provide views of the facility's exterior and the interior of the rotunda. Windows line the perimeter of the rotunda spanning vertically from floor to floor.



**Site Photo 4. Exterior view of administration building**

The construction was reinforced concrete beams and floor slabs with what are assumed to be reinforced concrete columns covered with stainless steel. The structure was configured to cantilever<sup>5</sup> from the interior column line over the rotunda floor.

The primary stairways are located in the central rotunda. The stairways are constructed of reinforced concrete with cultured marble treads. Decorative brass and stainless steel railings are on both the stairs and at the balconies (Site Photo 5).

The rotunda flooring consisted of decorative ceramic tile. The tile quality was good and tile placement showed quality workmanship. The contractor provided a decorative inlay at the center of the rotunda using the USACE emblem (Site Photo 6).

The contractor finished the rooms for the structure. The facility's manager stated that the offices' furnishings were donated. SIGIR observed several offices that appeared to be clean, well maintained, and adequately furnished.

In addition to offices, the administration building contained general meeting rooms and a children's library. The children's library contained books, tables, and chairs. The library appeared to be clean and well maintained.

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<sup>5</sup> Cantilever construction allows for overhanging structures without external bracing.



**Site Photo 5. Central rotunda primary stairwell**



**Site Photo 6. Decorative inlay in rotunda tile flooring**

### *Multi-Purpose Building*

The multi-purpose building was constructed in a similar architectural style as the administration building. The structure is octagonal in shape and centers on a rotunda with a glass dome. The reinforced concrete beams are exposed and well finished, adding to the architectural interest.

A balcony surrounds the rotunda at the second level. Decorative brass and stainless steel handrails, similar to that used in the administration building, were constructed at the edge of the balcony. The columns are covered in stainless steel (Site Photo 7).



**Site Photo 7. Rotunda of the multi-purpose building**

The multi-purpose building contains a large auditorium with a tiered seating area and a raised stage (Site Photo 8). The auditorium was finished with plaster walls and ceramic tile flooring.

At the time of the inspection, the plastered walls were in good condition with only minor hairline cracking, which is typical in new structures due to initial settlement. The quality of the tile was good, and the placement exhibited quality workmanship.

The auditorium was furnished by MOSA with commercial-grade furniture. In addition to providing furniture, MOSA provided musical instruments and equipped the auditorium with a sound system. During the inspection, one of the children was playing the piano, and the acoustics of the auditorium were good.

In addition to the auditorium, the first floor of the multi-purpose building contains the cafeteria and kitchen for the facility. The cafeteria includes roughly the same amount of floor space as the auditorium, with the remainder of the first floor used for corridors, restrooms, and administrative offices. The cafeteria was configured with partial partitions to separate the young males, females, and senior citizens of the facility.

The cafeteria incorporates a floor to ceiling glass exterior wall as an architectural feature that permits ambient light and creates a pleasant atmosphere in the cafeteria (Site Photo 9). The cafeteria was finished with plaster walls and ceramic tile flooring. The placement and quality of the tile was similar to the construction seen in the auditorium. The cafeteria was furnished by MOSA with commercial grade furniture.



**Site Photo 8. Multi-purpose building auditorium**



**Site Photo 9. Multi-purpose building cafeteria**

A single-story kitchen was annexed to the multi-purpose building. The kitchen consisted of commercial grade appliances, which included large gas cooking surfaces and deep fryers with stainless steel ventilation hoods (Site Photo 10). At the time of the site assessment, cafeteria personnel were preparing the noon meal.

The kitchen area provided a significant amount of space for food preparation. The contractor installed cabinets and countertops in the kitchen for storage and work areas.



**Site Photo 10. Commercial grade kitchen appliances**

The kitchen walls and floor were finished with ceramic tiles. The ceramic tile surface is easy to clean. During the site assessment, SIGIR staff noted that the kitchen staff performed routine custodial care of the kitchen, and the area was clean and well maintained.

The multi-purpose building was constructed with a second floor that was dedicated for music, crafts, computers, sports, and administration. Due to time limitations, the SIGIR inspection team was unable to view the second floor of the multi-purpose building.

#### *Children's Residential Houses*

Two residential houses were constructed to provide housing for the younger occupants of the facility (Site Photo 11). Each residential house was divided into three separate, three-story units. One residential house was for male children and the second residential house was for female children, and each dormitory separated the children by age.

Each floor contains a suite of two bedrooms, kitchen, bathroom, and a common area. The common area was built to accommodate the occupants of each individual floor (Site Photo 12). The interior walls were finished with plaster; the floors were covered with carpet in the bedrooms and ceramic tile in the remaining areas. SIGIR did not note any significant defects in the quality of construction.

The restrooms' walls and floors were finished with ceramic tiles. The tiles appeared to be good quality, and the tile installation showed quality workmanship. The restrooms contained both eastern and western-style toilets and the quality of the fixtures was adequate.



**Site Photo 11. Exterior view of residential house for boys**



**Site Photo 12. Male residential house common area**

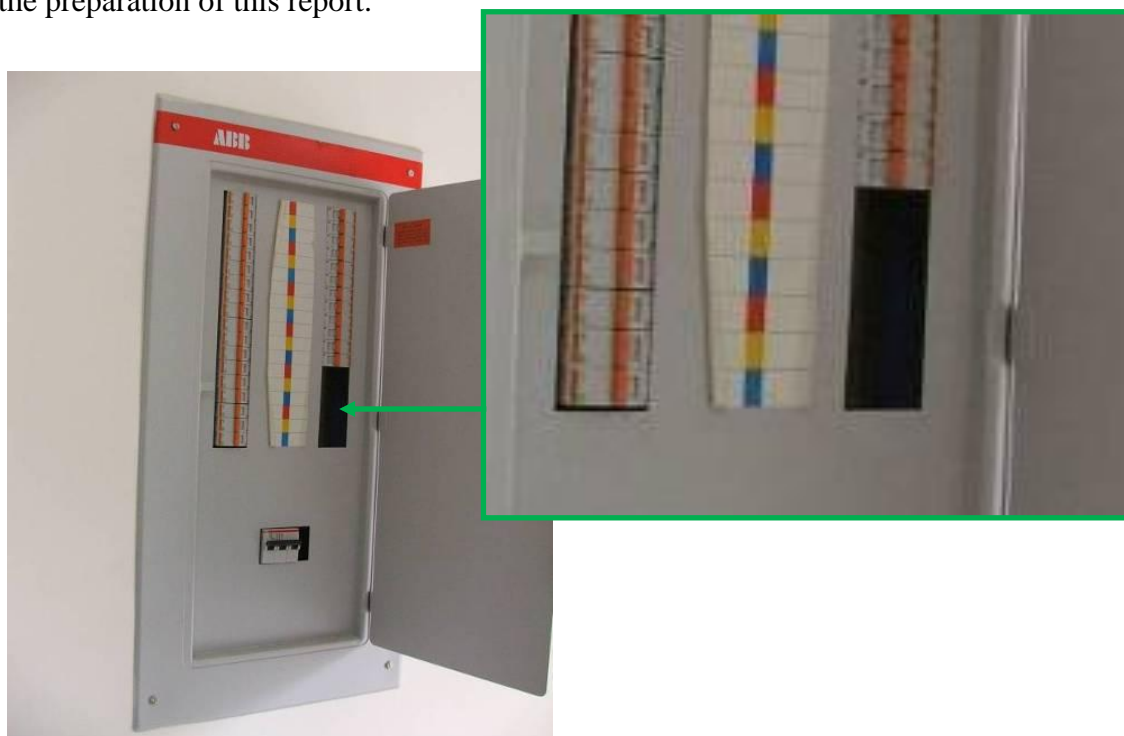
The bedrooms were arranged to accommodate three younger children or two older children. During the assessment, SIGIR noted that the bedrooms were satisfactorily furnished and maintained (Site Photo 13).



**Site Photo 13. Female residential house bedroom**

The utilities for the children's residential houses were functioning at the time of the site assessment. The ambient temperature was low enough that the air conditioning was not in use; however, the room ceiling fans were operating.

During the site assessment, SIGIR noted the primary circuit breaker panels for each unit in the children's residential houses were located on the exterior of the building. The primary circuit breaker panels were not locked and access was readily available (Site Photo 14). At the time of the site visit, SIGIR noted that there was no barrier in place over the unused panel circuits; however, the Erbil Resident Office rectified the situation prior to the preparation of this report.



**Site Photo 14. Primary circuit breaker panel with no barrier**

### Senior Citizens' Residential House

The senior citizens' residential house was constructed similarly to the children's residential houses; however, the building was configured as one complete unit. The elderly housing unit contains three floors with a living suite on each floor (Site Photo 15). The general dimensions of the building are the same; however, additional bedrooms were on each floor, and a physician's office was on the first floor.

Mobility and access issues for the senior citizens were addressed in the design. An automatic door was at the main entry to the building, and an elevator provided access to the individual suites. At the time of the site assessment, the automatic door was functioning; however, the elevator was out of service. The facility manager stated that the elevator was not operational but was still under warranty and that the contractor would repair the elevator.



**Site Photo 15. Senior citizen's living suite**

### Recreation Areas

The project construction included several outdoor recreation areas for the children. The areas included: a playground; an outdoor, synthetic-surfaced soccer field; and a swimming pool. According to the facility manager, the swimming pool was constructed through donations.

The playground consisted of several pieces of outdoor equipment that included a sliding board, see-saw, merry-go-round, and swing set (Site Photo 16). The playground was suitable for smaller children. Outdoor lighting was provided throughout the play area and should provide adequate lighting in twilight and nighttime hours. Raised gravel walkways separate the different pieces of play equipment.

A soccer field was constructed adjacent to the playground. The soccer field was completely enclosed within a chain-link fence, and was covered with netting to prevent players from kicking the ball out of the compound. The surface was a synthetic turf over a hard subsurface.

The swimming pool was located on the opposite side of the administration building, away from the dormitories (Site Photo 17). The facility's manager stated that the pool was located there to prevent unauthorized access by the children. Also, the swimming pool was surrounded by a security fence with a gate to limit access by unauthorized individuals.



**Site Photo 16. Playground**



**Site Photo 17. Swimming pool**

### Utilities and Physical Plant - Electricity

The project was connected to the national grid, and the contractor installed a backup generator. The facility manager stated that the facility receives between 16 and 20 hours of electricity per day. When the national grid does not provide power, an automatic transfer switch engages the generator. Also, the facility's manager stated that the Ministry supplies the diesel for the generator. At the time of the site assessment, the national grid was supplying power to the facility and the generator was not running.

The backup generator and transformer were housed together in a separate building with a CMU wall separating the transformer from the generator. In the event that catastrophic failure of either component occurs, the other should remain functioning.

A method of securing the generator and transformer enclosures was provided. The doors to the building were lockable with both a deadbolt and an exterior padlock. At the time of the inspection, the deadbolts to the generator and transformer building were not locked. Also, SIGIR noted that there were no signs on the generator and transformer building warning of high voltage or shock hazard.

However, since the site assessment, the Erbil Resident Office worked with the contractor to have warning emblems installed on the generator building (Site Photo 18) who will also supplement the symbols with warning text.



**Site Photo 18. Warning sign on generator building (Courtesy of the USACE)**

### Utilities and Physical Plant - Water System

The water system for the project consists of a pump station and a water tower to provide pressurized potable water to the facility. The pump station was situated near the front entry of the facility with the main waterline to the water tower running beneath the parking lot. Due to time limitations, SIGIR was unable to enter the pump station.

The water tower was constructed near the front entrance of the facility, adjacent to the female children's dormitory. The water tower consisted of reinforced concrete frame

tower supporting the cylindrical steel water tank. A steel spiral staircase attached to the tower provides access to the water tank. Both feed and distribution lines were positioned on the exterior of the tower. SIGIR could not determine if access to the tower was restricted; however, a barrier should be constructed to prevent children from accessing the staircase and climbing the water tower. The lack of a barrier presents a significant safety hazard. According to the GRN local engineer, the contractor is currently fabricating an access barrier for the water tower and will install it upon completion.

## Conclusions

On 7 February 2009, the Gulf Region North (GRN) Erbil Resident Office officially turned over the Orphanage and Senior Citizen Assisted Living Center project to the Director of the Ministry of Social Affairs, Erbil Governorate. The Certificate of Deliverables document noted that the director received the operation and maintenance manuals, as-built drawings, and the warranty documents.

According to GRN documentation, authorized GRN Erbil Resident Office personnel conducted pre-final inspections on 27 December 2008 and 15 January 2009. The pre-final inspections noted minor problems for the contractor to correct in the buildings. The final inspections for the buildings commenced on 28 December 2008 and were finalized on 23 January 2009. The final inspections showed that the work required by the contract was accomplished without any noted deficiencies.

On 9 July 2009, SIGIR conducted an on-site assessment of the project. During the site visit, SIGIR was accompanied by the Project Engineer of the GRN Erbil Resident Office, personnel of the Kurdish Regional Ministry, and staff of the Orphanage and Senior Citizen Assisted Living Center. During the site visit, the Orphanage and Senior Citizen Assisted Living Center was occupied and functioning.

Before the site visit, SIGIR reviewed the GRN-provided conceptual drawings that were provided to the contractor, which included the architectural layout and building designs. SIGIR also reviewed contractor-generated drawings which contained specific information regarding the structural details, building mechanical systems, site utilities, site drainage, sewage collection system, and other project features. Based on the detailed Statement of Work and the inclusion by reference of other applicable codes and standards, adequate information was provided in the specifications for the contractor to complete the final design and construct the facility. In addition, the contractor provided detailed final design drawings and plans that contained specific information for the construction of the Orphanage and Senior Citizen Assisted Living Center.

Although the contract did not require a geotechnical report, the contractor supplied a geotechnical report, which was prepared by a local construction laboratory. The report contained information on the borings, physical and chemical properties of the soil, and the allowable soil-bearing capacity.

SIGIR's review of the design documentation determined that the initial design and construction of the project appeared adequate. A number of potential safety concerns were identified during the site inspection, but they were rectified prior to the preparation of this report.

SIGIR concluded that the construction of the facility was adequate; aside from the minor safety concerns noted, the project was operating at the capacity provided for in the

contract. At the time of the site visit, the Orphanage and Senior Citizen Assisted Living Center had been operational for approximately five months.

## **Recommendations**

This report contains no recommendations for corrective action. Therefore, management comments were not required.

## **Management Comments**

Although management comments were not required, SIGIR received comments from the Gulf Region Division of the U.S. Army Corps of Engineers concurring with the draft report.

## **Evaluation of Management Comments**

SIGIR appreciates Gulf Region Division concurrence with the report.

## Appendix A. Scope and Methodology

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SIGIR performed this project assessment from April through September 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 two engineers/inspectors.

In performing this Project Assessment SIGIR:

- Reviewed contract documentation, including contract W917BE-07-C-0088, Modification P00001, Modification P00002, Modification P00003, and Modification P00004;
- Reviewed quality management reports – quality control plan, quality control safety plan, quality control daily reports, quality control weekly reports, quality assurance daily reports, quality assurance weekly reports, quality control photographs, quality assurance photographs, material submittals, test results, test reports, and invoices;
- Reviewed pre-final project closeout documentation and final project closeout documentation;
- Reviewed the available design package (plans) - drawings and specifications, Funding Activity Form, Scope of Work, Bill of Quantities; and
- Conducted an on-site assessment on 9 July 2009 and documented the results at the Orphanage and Senior Citizen Assisted Living Center project in Erbil, Iraq.

**Scope Limitation.** SIGIR performed an expedited assessment. The time allotted for the Orphanage and Senior Citizen Assisted Living Center was approximately 2 hours; therefore, a complete review of all completed work was not possible.

## **Appendix B. Acronyms**

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CMU	Concrete masonry unit
GRN	Gulf Region North
HVAC	heating, ventilation, and air conditioning
IBC	International Building Code
IGTS	Iraqi General Technical Specifications
MOSA	Ministry of Social Affairs
QA	Quality Assurance
QC	Quality Control
SIGIR	Special Inspector General for Iraq Reconstruction
SOW	Statement of Work

## **Appendix D. Report Distribution**

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### **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 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

Kevin O'Connor

Shawn Sassaman, P.E.

Yogin Rawal, P.E.