

BAGHDAD AL KARKH
COURTHOUSE
BAGHDAD, IRAQ

SIGIR-PA-06-058
OCTOBER 10, 2006

Report Documentation Page

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SPECIAL INSPECTOR GENERAL FOR IRAQ RECONSTRUCTION

October 10, 2006

MEMORANDUM FOR COMMANDING GENERAL, MULTI-NATIONAL FORCES-
IRAQ
DIRECTOR, IRAQ RECONSTRUCTION MANAGEMENT
OFFICE
COMMANDING GENERAL, GULF REGION DIVISION-
PROJECT AND CONTRACTING OFFICE, U.S. ARMY
CORPS OF ENGINEERS

SUBJECT: Report on Project Assessment of the New Al Karkh Courthouse,
Baghdad, Iraq (Report Number SIGIR-PA-06-058)

We are providing this project assessment report for your information and use. We assessed the in-process construction work performed on the New Al Karkh Courthouse an IRRF funded, Facilities and Transportation project located in the Baghdad Governorate to determine its status and whether intended objectives will be achieved. This assessment was made to provide you and other interested parties with real-time information on a relief and reconstruction project in order to enable appropriate action to be taken, if warranted. The assessment team included an engineer and an auditor.

This report does not contain any negative findings. As a result, no recommendations for corrective action are made and further management comments are not required.

We appreciate the courtesies extended to our staff. This letter does not require a formal response. If you have any questions please contact Mr. Brian Flynn at (703) 604-0969 or brian.flynn@sigir.mil or Mr. Jon Novak, at (703) 343-9149 or jon.novak@iraq.centcom.mil.

Stuart W. Bowen, Jr.
Inspector General

Special Inspector General for Iraq Reconstruction

SIGIR PA 06-058

October 10, 2006

Baghdad Al Karkh Courthouse Baghdad, Iraq

Synopsis

Introduction. This project assessment was initiated as part of our continuing assessments of selected sector reconstruction activities for Facilities and Transportation. The overall objectives were to determine whether selected sector reconstruction contractors were complying with the terms of their contracts or task orders and to evaluate the effectiveness of the monitoring and controls exercised by administrative quality assurance and contract officers. We 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 a professional engineer and an auditor.

Project Assessment Objectives. The objective of this project assessment was to provide real-time relief and reconstruction project information to interested parties in order to enable appropriate action, when warranted. Specifically, we 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 U.S. Government's Quality Assurance program were adequate;
4. Project sustainability was addressed; and
5. Project results were consistent with original objectives.

Assessment Scope:

Security concerns prevented the SIGIR assessment team from visiting the project site. Although we relied heavily on documentation contained in the USACE project files and interviews with the USACE representatives, we supplemented the information with satellite imagery of the project taken August 10, 2005 and May 16, 2006.

Conclusions. The assessment team determined:

1. The majority of the project components were sufficiently designed to construct the courthouse complex buildings and facilities. The design package provided to the assessment team contained site, architectural, plumbing, mechanical, and electrical design drawings, as well as detailed specifications. Gulf Region Division engineers reviewed and commented on the design drawings and the final design package integrated their comments. The assessment team determined the design package did not contain a landscape plan, typical details on interior wall and false ceiling construction, structural drawings for the administrative check points, or drawings for the generator fuel system. Notwithstanding these omissions, the design package was adequate to construct the courthouse complex buildings and facilities.

2. The assessment team did not visit the project site because officials at Gulf Region Division determined it was not safe for the team to travel to the site and because the presence of the assessment team increased the potential danger for the Iraqis working at the site. Therefore, SIGIR's evaluation of the project construction was limited in scope. Our evaluation was based on a review of the contract file documentation including quality assurance reports and progress photos, and our interviews with United States Army Corps of Engineers, Resident Office personnel, as well as interviews with Gulf Region Division-Project and Contracting Office staff. In addition, we reviewed commercially available satellite imagery of the courthouse site to independently verify the construction progress. Based on our review of the documentation provided, we found the workmanship adequate to construct the courthouse complex buildings and other facilities. We did have some concerns with the ceramic tile installation practices and the quality of the water circulation pumps, which are noted in the report. However, overall, based on our review of the contract documents, the construction from project start though 3 July 2006 appeared to meet the requirements of the design. The documentation indicated when problems were encountered with the quality of workmanship; the United States Army Corps of Engineers Resident Office staff identified deficiencies and managed the contractor's corrective actions.
3. The contractor's Quality Control plan was sufficiently detailed to effectively guide the contractor's quality management program. Further, the contractor's daily Quality Control reports contained required project and work activity information to document construction progress and identify problems and required corrective action.

Based on our review of available program documentation, the Government Quality Assurance program appeared effective in monitoring the contractor's quality control program. The Project Engineer and the Iraqi Quality Assurance Representative ensured deficiencies cited during quality assurance inspections were corrected. The Iraqi Quality Assurance Representative maintained daily quality assurance reports containing project-specific information documenting construction progress and highlighting deficiencies. In addition, the Iraqi Quality Assurance Representative supplemented the daily reports with detailed photographs reinforcing the narrative information provided in the reports.

4. Sustainability was addressed in the contract requirements. The contract specifications required the contractor to provide and certify warranties in the name of the appropriate Ministry, for all equipment which includes any mechanical, electrical and/or electronic devices, and all operations for 12 months after issuance of the Taking-Over-Certificate. The contractor was to provide any other commonly offered extended warranties for equipment and machinery purchased. In addition, the contractor was to provide two (2) sets of complete Operation and Maintenance manuals, which include all generator and equipment information, electrical single line diagrams, schematics, and maintenance information. The contractor is required to arrange for technical training from the system manufacturer, for up to ten personnel. The contractor is required to provide spare repair parts, as recommended by the system manufacturer, for one complete year of operation. The contractor was to complete all inspection and commissioning requirements prior to the final inspection.

5. Based on the assessment team's review of the project documentation, the Al Karkh Courthouse construction appeared to be consistent with the intent of the project. Although we cannot say unequivocally the project results are meeting the overall objectives because of the inability to visit the site, there is no indication that the project results to date would not meet the task order objectives.

Recommendations. This report does not contain any negative findings or recommendations for corrective action. Therefore, management comments are not required.

Management Comments. The Gulf Region Division concurred with the conclusions contained in the report and provided additional information regarding the description of the facility (pre-construction) and the percentage of completion. The additional information has been incorporated into the final report.

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Introduction

Objective of the Project Assessment

The objective of this project assessment was to provide real-time relief and reconstruction project information to interested parties in order to enable appropriate action, when warranted. Specifically, we 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 (CQC) plan and the U.S. Government's Quality Assurance (QA) program were adequate;
4. Sustainability was addressed; and
5. Project results are consistent with original objectives.

Pre-Site Assessment Background

Contract, Task Order, and Costs

The Baghdad Al Karkh Courthouse project will be completed under Contract W916QW-04-D-0014; Task Order (TO) 0004, dated 16 April 2005, a firm-fixed price contract, for \$2,233,581.90. The contract was between the United States Army Corps of Engineers (USACE) Gulf Regional Division – Central District (GRC) and a local Iraqi contractor. Contract W916QW-04-D-0014 called for the construction of a new Judicial Facility with exterior/interior security perimeter, buildings, utilities, and an emergency electrical power generator.

There were two modifications to the contract W916QW-04-D-0014, Task Order 0004:

- Modification # 01, issued 25 April 2005, reflected the following changes to the contract:
 - CLIN 0001
 - The CLIN description has changed from COURT ANNEX to SAFE HOUSE (Court Annex).
 - The CLIN extended description has changed from “The Contractor shall provide all labor, management personnel, materials and all necessary equipment to perform in accordance with the Scope of Work in the Task Order” to “The Contractor shall provide all labor, management personnel, materials and all necessary equipment to perform in accordance with the Safehouse Specifications dated 16 April 2005”.
 - CLIN 0002
 - The CLIN description has changed from S&A LINE ITEM to Al Karkh New Court Construction.
 - The CLIN extended description GRD New Central Court Construction, Ministry of Justice, GRB Central Iraq. Contractor shall provide the design/build services for the new

Project Objective

The overall objective of this task order was to construct a new courthouse in the Al Karkh District of Baghdad. According to the Statement of Work (SOW):

“The intent for new construction of the court facilities is to construct and secure a court facility necessary to establish the rule of law in Iraq within the budgeted design/build amounts.”

Description of the Facility (pre-construction)

The description of the facility (pre-construction) was based on information obtained from the contract and the USACE DRE. Prior to construction, the Al Karkh Courthouse site was in an open agricultural area, in the northwestern part of Baghdad. Due to the nature of the land use, the site contained organic soil conditions. The topography of the courthouse site is level. Commercial electrical power and city provided water and sewer are available utilities. Electrical transmission lines need to be installed to connect with the available commercial power approximately 1.10 km from the site.

Scope of Work of the Task Order

The SOW required the contractor to:

“Design/build new Court Facilities as required based upon the architectural program developed by Project Team (Owner, Owner’s Representative, PCO, SPCO, and contractor) for each referenced site.”

In addition, the SOW provided a listing of the specific line items for this project, which included:

- Exterior security perimeter
- Civil site work
- Building
- Utilities
- Emergency electrical power generator

Based on the USACE provided design, the Al Karkh Courthouse project included construction of the following buildings and facilities:

- Perimeter wall
- Check points
- Internal roads and parking areas
- Courthouse building
- Electrical transformer vault building and emergency electrical generators
- Maintenance/water storage building
- Cafeterias
- Exterior bathrooms
- Kiosks
- Landscaping and gardens.

In addition to the buildings listed above, the courthouse complex contained an annex building. The annex was being constructed concurrently with the courthouse project. However, the annex project was a separate requirement under a different task order

and not part of our assessment scope. The courthouse building, annex building, and other buildings and facilities within the complex are situated on a flat site with an overall area of 72,617 square meters.

Current Project Design and Specifications

The contract SOW required the contractor to provide engineering and architectural design for all work necessary to complete the project. In addition to construction drawings, the SOW required specifications for all piping materials, electric wire, electrical components, generators, pumps, air conditioners, windows, doors, metals, and other materials and equipment as deemed necessary by the Sector Project and Contracting Office Program Manager.

The design provided to the assessment team by USACE contained the following drawings for the courthouse building:

- Architectural
- Structural
- Mechanical (heating, ventilation, and air conditioning [HVAC])
- Electrical (electric, lighting, fire alarm, CCTV, telephone)
- Plumbing (water supply and sanitary)

There were also architectural, structural, electrical, plumbing and sanitary drawings for the other courthouse complex facilities including the maintenance/water storage building, the electrical building, the cafeterias, the bathroom buildings, the kiosks, and checkpoints.

The civil drawings for the courthouse complex included details showing the road and fence construction, as well as the utility distribution systems (water, sewer, electrical) for the site. The contractor also provided detailed specifications in Construction Specification Institute (CSI) format.

An earlier iteration of the design was reviewed by representatives of GRD-PCO in July 2005. The contractor appeared to have incorporated their comments into the later version of the design drawings, dated 22 December 2005.

In our review of the 22 December 2005 design package, we found several areas where the design was insufficient, as detailed in the following:

- The architectural drawings do not provide any typical details showing the false ceiling installation. Further, two types of false ceiling were constructed: (1) a suspended ceiling grid with gypsum ceiling panels; and (2) a false ceiling constructed using a metal frame, then attaching a wire mesh lath, and finally plastering and painting. Details were not provided for either type.
- There were no typical or sectional details showing the interior wall construction for either the 25 centimeter (cm) thick walls or the 36 cm thick walls.
- External fuel tanks for the electrical generator were not shown on the drawings, nor were the piping connections to the generators.
- The design package did not include structural design details for the administrative checkpoints. The Quality Assurance Reports and construction progress photos show construction of reinforced concrete roof slabs and the canopy section supported by reinforced concrete beams and columns.

- A landscaping plan was not provided. In addition, we could not find any drawings pertaining to the fountains or the paved stone sidewalks.

Notwithstanding the above, the design submittal appeared to be satisfactory for the majority of the construction work required by the task order.

Site Assessment

Security concerns prevented the assessment team from visiting the Al Karkh Courthouse project site. Although the project assessment relied heavily on documentation contained in the project files and interviews with the USACE Deputy Resident Engineer (DRE), the USACE Quality Assurance Representative (QAR) and the PCO Facilities and Transportation Sector program and project managers, SIGIR obtained satellite imagery of the project site dated August 10, 2005 and May 16, 2006 for further verification. Information contained in the project files included the task order, task order modifications, SOW, the BOQ, the design package (drawings and specifications), Quality Assurance Plan, Quality Control Plan, Contractor's daily Quality Control Reports, and USACE Quality Assurance reports.

The project was reported as 92% complete based on the PCO database of 7 July 2006. After adjusting for stored materials, the September 2006 percentage of completion for work actually installed was 86%.

Work Completed

At the time of the assessment in early July 2006, based on our review of the quality assurance reports, none of the buildings and facilities listed in the Scope of Work Section of this report was complete.

Work in Progress

Perimeter Wall

Section 2.15 of the SOW required the contractor to: "Provide a complete design illustrating all proposed new work for the complete installation of the security perimeter systems, both internal and external." The SOW also required the contractor to conduct a cost analysis of in place construction of security walls versus T-wall emplacement and not to begin construction [*of the security wall*] until approved by the Sector Project and Contracting Office (SPCO).

The assessment team did not find a record of the SPCO approval. However, the design provided by USACE included one drawing showing a 24 centimeter thick brick perimeter wall supported by a reinforced concrete foundation. The design required a wall height of three meters, which included one roll of barb wire at the top of the concrete coping. Also, according to the USACE DRE, as an added security measure, the contractor will place T-walls around the courthouse just prior to the closeout of the contract.

Based on our review of the QA reports and progress photos, there were no issues with the quality of the workmanship on the brick perimeter wall. Site Photo 1 shows the contractor's workers rendering the brick wall using a cement plaster.



**Site Photo 1. Rendering the Brick Perimeter Wall with a Cement Plaster
(Photo provided by USACE)**

Courthouse Building

The courthouse consists of two stories with an approximate area of 4,480 square meters (m²). The building has courtrooms, offices for legal staff, meeting rooms, holding cells, break rooms, bathrooms, a courtyard with interior garden, two elevators and an atrium with dome ceiling located near the front entrance to the courthouse. Figure 1 provides a rendering of the courthouse, showing it when completed. Since the assessment team could not visit the site, we were limited in the depth of our assessment. Therefore, in this section, we do not comment on every building component associated with the courthouse. We instead focus our review and assessment on components where there was sufficient documentation available in the QA reports and progress photos.



Figure 1. Artist rendering of the Al Karkh Courthouse (Photo provided by USACE)

Structural Components

The courthouse building was designed as a two-story, reinforced concrete and brick structure, supported by a 40 cm thick reinforced concrete “raft” foundation¹ constructed over 50 cm of compacted sub-base material. The first floor slab and the roof slab are designed as cast in place reinforced concrete floors, 20 cm thick. Most of the structure is comprised of load bearing clay brick walls. In addition to the raft foundation, the roof and ground floor slabs, and load bearing walls, the other structural components included exterior reinforced concrete columns (30 cm in diameter) along each face of the building and along the perimeter of the courtyard. The portico roof as depicted in Figure 1 is also supported by circular (30 cm in diameter) reinforced concrete columns.

The building’s two courtrooms on the ground floor have high ceilings and there is no second story above them. The design required the courthouse building’s roof above the courtrooms to be supported by a network of rectangular reinforced concrete columns and beams. Also in the atrium, the design requires the roof dome to be supported by reinforced concrete columns and beams.

In reviewing the QA reports, we found the QAR identified in the 20 October 2005 QA report two design issues requiring corrective action.

1. Due to the building expansion joint location, an additional column was needed to support the curved portion of the roof near the entrance into the building from the back of the courtyard. Based on our review of subsequent QA reports, an additional column was added and constructed to support the roof.
2. There were differences in the architectural and construction plans with respect to the courtroom dimensions and locations of the reinforced concrete columns. As designed, the column system could not be distributed as required around the edges of the rooms. The structural drawings showed the column spacing at 6.5 m, while the architectural drawings reflected a lower spacing dimension of about 5.4 m. The architectural and structural drawings reviewed by the assessment team, dated 22 December 2005, show the discrepancy noted by the USACE QAR. The QAR, in the 20 October 2005 QA report, requested a meeting with the USACE GRC designer to resolve the issues. However, subsequent QA reports did not document any solution or a continued problem.

Overall, based on our review of the QA reports and the progress photos, the structural contract work appeared to meet the requirements of the SOW and the design. One of the contributing factors was the contractor’s concrete operations. The contractor set up a batch plant on site because of the significant concrete requirements. In addition, for large floor and roof slab concrete pours, the contractor utilized multiple pump trucks to place the concrete. As an example, Site Photos 2 and 3 show the booms from the contractor’s pump trucks delivering concrete for the roof slab placement.

¹ A raft foundation normally consists of a concrete slab which extends over the entire building area. Raft foundations have the advantage of reducing differential settlements as the concrete slab resists differential movements between loading positions.



Site Photo 2. Pump truck booms delivering concrete for roof slab pour (Photo provided by USACE)



Site Photo 3. Concrete placement for roof slab pour (Photo provided by USACE)

In our review of the progress photos and QA reports we did not find any evidence of problems with the quality of the concrete, such as honeycombing, segregation, or exposed reinforcing steel. Additionally, our review of the QAR reports did not indicate any problems with the concrete achieving required compressive strengths.

Brick Walls

The design did not provide typical wall detail sections except for seven specific exterior wall locations on three detail sheets, which showed 25 cm thick brick walls. According to the DRE, the design originally called for the entire building exterior to be finished using stone panels. Instead, because of the stone panel shortage, only parts of the building's exterior (along the building corners, the parapet and window frames) would be clad with the stone panels. The remaining brick walls according to the DRE will be plastered and painted as shown in Site Photo 4. According to the most recent QA report, dated 3 July 2006, the outside finish work (stone panel application, plastering and painting) was in progress.



Site Photo 4. Plastering exterior wall between windows (Photo provided by USACE)

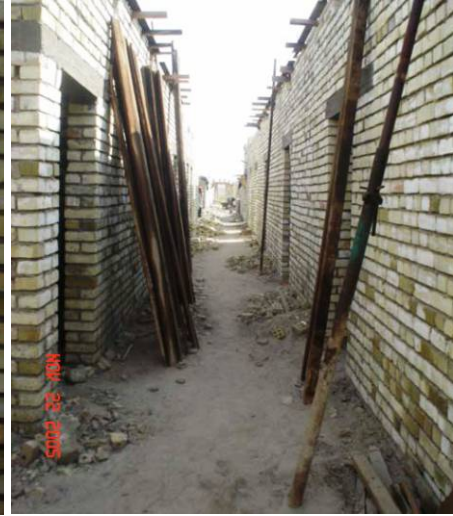
In discussions with the USACE DRE and review of the QA reports, we established the brick walls serving as load bearing walls on the ground floor were 36 cm thick. The design did not include detail sections showing 36 cm walls, but in the floor plan views for the ground and the first floor, the locations of the 36 cm walls were shown, as well as the 25 cm walls. On the first floor, the QA reports document the contractor constructing 24 cm walls² on some parts of the first floor, and 36 cm load bearing walls in others. Site Photos 5 and 6 provide examples of the 36 cm interior wall construction and the 24 cm interior wall construction.

Based on our review of the progress photos and QA reports, the brick wall requirements appeared to meet the standards of the design. We did find a QA report where the USACE QAR identified inferior quality bricks and workmanship resulting in poorly constructed wall sections. The QAR instructed the contractor to remove the substandard wall sections.

² The design shows 25 cm walls but the QA reports note the wall thickness as 24 cm. The assessment team discussed the difference with the USACE DRE. The DRE indicated the 25 cm thickness includes the plastering coat in the thickness, whereas the QA report reference to the 24 cm thickness does not.



**Site Photo 5. 36 cm walls on ground floor
(Photo provided by USACE)**



**Site Photo 6. 24 cm walls on ground floor
(Photo provided by USACE)**

Interior Finishes

The design included finish schedules providing the required ceiling, wall, and floor finish for each courthouse room. The finish schedule required ceramic tile floors throughout the courthouse. The progress photos and QA reports indicate the ceramic tile was placed over the concrete slab using a sand and cement mix as shown in Site Photo 7. Based on this photo as well as the others reviewed by the assessment team, it appears the sand was spread to a certain thickness on the concrete floor slab. Next, a cement slurry was added to the top of the sand to provide a bonding surface for the tile. However, the cement slurry has not been mixed with the sand and does not provide a bond to the concrete substrate. This is regarded as standard construction practice in Iraq for laying ceramic tile. The sand is utilized for leveling and the cement provides the bond between tiles. Although there were significant requirements for ceramic tile throughout the courthouse, our review of the progress photos and QA reports indicated the ceramic tile installation was accomplished without deficiencies noted by the QAR.



Site Photo 7. Laying ceramic tile (Photo provided by USACE)

The room finish schedules also required painted ceilings or suspended ceilings. The design shows suspended ceilings in the hallways, lobby areas, and some of the bathrooms. Site Photo 8 provides an example of the suspended ceiling construction using gypsum ceiling tiles. The other type of suspended ceiling involved hanging a metal frame, then attaching a wire mesh lath to act as a plaster base. The ceiling was then plastered and painted. The QA reports indicate there were no deficiencies associated with either type of suspended ceiling installation or the plastering and painting of walls and ceilings.



Site Photo 8. Suspended ceiling and tile installation (Photo provided by USACE)

Dome Construction

The roof dome over the building's atrium was a unique architectural feature of the building. The design required a reinforced concrete dome structure, clad with an exterior finish of stone panels. To build the dome, the contractor constructed a reinforced concrete base and a middle section with brick. The dome's middle section was anchored to the existing concrete base using structural steel H-columns as shown in Site Photo 9. Site Photo 10 shows the steel reinforcement in place in the dome prior to concrete placement and Site Photo 11 shows the dome after concrete placement and sealing with a bituminous waterproofing coat. The QA reports did not indicate any problems with the workmanship or document any deficiencies associated with the dome construction.



Site Photo 9. H-Columns anchored to dome concrete base (Photo provided by USACE)



Site Photo 10. Dome after reinforcing steel installation (Photo provided by USACE)



Site Photo 11. Dome after concrete placement and waterproofing (Photo provided by USACE)

Heating Ventilation and Air Conditioning (HVAC) Systems

The design required 15 roof top HVAC units with a total cooling capacity of 795,000 BTU/hour or 66.25 tons. Site Photo 12 shows one of the roof top units. The progress photos indicate two types of HVAC units were installed, an Airtemp Model 530 and an Airtemp Model 415. We were not provided with the manufacturer's catalog information showing the cooling specifications of each type of unit installed; therefore, we could not verify if the units met the requirements of the design.



Site Photo 12. Roof top HVAC unit (Photo provided by USACE)

Electrical Transformer Building

The design required a one-story building, 18.25 m x 6 m. The floor plan shows a room for each of the three transformers, a separate room for the low voltage distribution boards, and a separate room for the medium voltage distribution boards. The foundation plan called for continuous wall footings supporting a concrete floor slab on grade. After constructing the foundation and floor slab, the contractor constructed a brick building with a reinforced concrete roof. The design called for

the interior and exterior building walls to be plastered and painted. Through our review of the QA reports, we verified the contractor plastered the interior and exterior of the building. We did not see progress photos showing the painting, but the most recent QA report reviewed, dated 3 July 2006, shows the building as 95% complete with outdoor painting remaining.

In reviewing the QA reports and progress photos, we did not find any indication the electrical transformers and distribution boards were installed as of 3 July 2006.

Electrical Generators

The design required two outdoor electrical generators to meet the courthouse electrical demand and the electrical requirements of the other buildings contained in the task order (cafeteria, kiosks, check points, bathrooms, etc.). The design called for two generators, a 1,000 kilo-volt amp (KVA) unit and a 650 KVA unit. According to the USACE DRE, two generators were installed, a 1,000 KVA unit for the courthouse including its HVAC requirements, and a 630 KVA unit for the courthouse and the other buildings. They also indicated a third generator (350 KVA) was installed for the annex building. Site Photo 13 shows the three generator enclosures after delivery to the generator pad site. Site Photo 14 provides an illustration of one of the generators installed. The QA reports and progress photos do not indicate the manufacturer of the generators or their electrical capacity. In addition to the generators, two fuel tanks were also installed as well as the piping, valves, and fittings. As noted earlier in the assessment team's design and specifications review, there were no drawings providing details on the generator and fuel tank installation.



**Site Photo 13. Generators for the courthouse (2) and the annex (1)
(Photo provided by USACE)**



**Site Photo 14. Interior of the generator enclosure
(Photo provided by USACE)**

Maintenance/Water Storage Building

The original concept called for a maintenance building approximately 124 m² in area and a separate 7.5 m x 5.5 m water tank building. Based on our review of the QA reports and progress photos and a review of the design drawings, at some point prior to construction the two building requirements were placed under one roof with a common foundation, while the floor plans remained as designed for each building.

The contractor constructed a raft foundation for the combined building and then constructed plastered brick walls and a reinforced concrete roof. The design room finish schedule called for concrete floors in the water storage room and ceramic tile in the maintenance areas. The USACE QAR documented problems with the quality of the ceramic tile laying in the bathroom and other rooms within the maintenance areas, as well as with the ceramic tile skirt around the bottom of the walls.

The design required a 6.10 m x 2.44 m x 1.22 m steel water tank mounted on a concrete pedestal inside the water storage area. Based on the QAR reports, the contractor installed a 14 cubic meter (m³) galvanized steel water tank in this room.

The design required four water circulation pumps, three for domestic water and one for the fire hydrant system. The capacity of the pumps according to the design was 18 m³/hour (hr) at 25 m head for the domestic water pumps and 18 m³/hr at 25 m head for the fire hydrant system pump. The contractor supplied and installed four circulation pumps. The pumps, based on our review of the QA report photos, do not appear new. We observed photos showing rust and dirt on the pump and motor housings. Site Photo 15 shows the condition of one of the pumps. In addition, the face plate on the fire hydrant pump system appears to have been altered because there are scratches in the entries for flow capacity.



Site Photo 15. Domestic water circulation pump (Photo provided by USACE)



Site Photo 16. Factory plate for fire hydrant system pump (Photo provided by USACE)

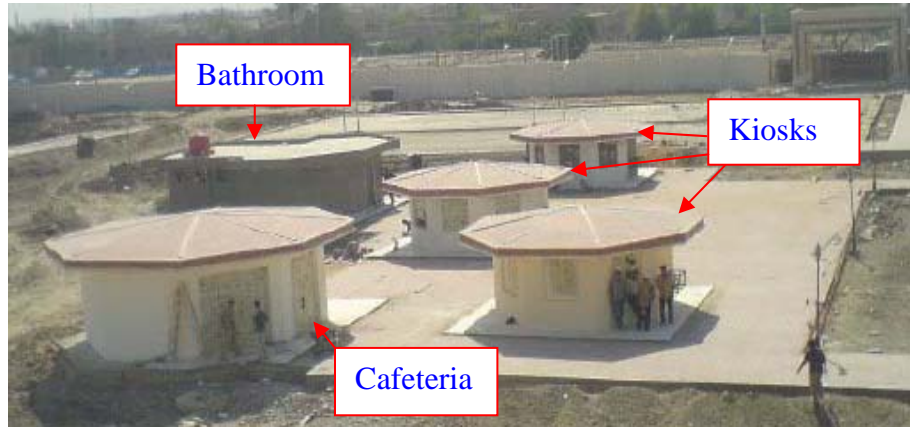
Cafeterias, Bathrooms, and Kiosks

The courthouse complex site plan shows two sets of cafeteria buildings, bathroom buildings, and kiosks, which flank the front of the courthouse on both sides. Each set of buildings consists of one bathroom, one cafeteria, and three kiosks. The structural design for each building was similar; a reinforced concrete raft foundation, a reinforced concrete roof, and load bearing brick walls. The bathroom roof was flat with a parapet, while the kiosks and cafeteria roofs were pitched. The design finish schedule required plastered and painted exterior walls for the bathrooms and cafeterias, accented with ceramic tile. The exterior finish schedule for the kiosks called for ceramic tile and artificial stone.

For the bathrooms, the interior finish included ceramic tile walls and floors, as well as a suspended gypsum tile ceiling. The interior finishes for the kiosks and cafeterias included a ceramic tile floor, plastered and painted walls, and a suspended gypsum tile ceiling.

The bathroom building floor plan consisted of four rooms, one containing eight water closets and another room containing eight wash basins. The other two rooms appeared to be for storage. The eight-sided cafeteria building contained three rooms, one with a kitchen sink and water heater, a second room with two wash basins, and a third empty room that appears to be the eating area. The eight-sided kiosk floor plan included two equal sized rooms.

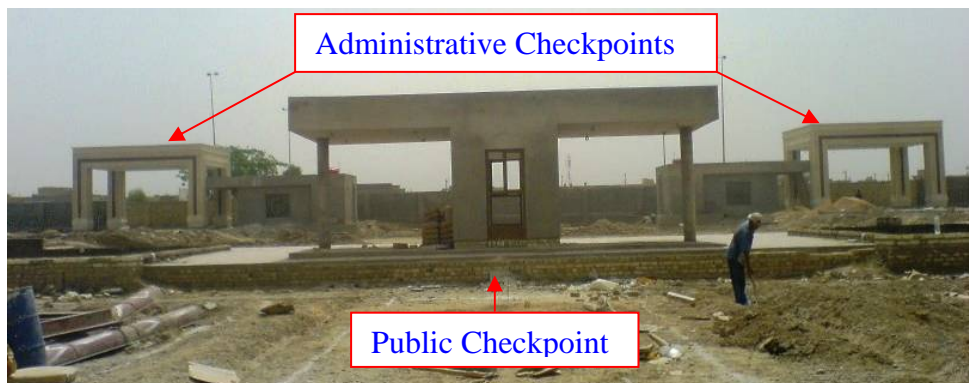
We could not verify the final finishes of each of the three building types. However, according to the 3 July 2006 QA report, the bathrooms, cafeterias, and kiosks were reported by the USACE QAR as 95% complete. The walls were plastered and painting was in progress. Site Photo 17 shows the nearly completed buildings. The QA reports do not indicate any problems associated with their construction.



Site Photo 17. Kiosks, bathroom, and cafeteria buildings (Photo provided by USACE)

Checkpoints

The design showed two types of checkpoints, an administrative checkpoint and a public/vehicle checkpoint. As noted earlier, there was no structural design for the administrative checkpoints. Based on a review of the finish schedule, the exterior finish included stone and ceramic tile. Site Photo 18 shows the two types of checkpoints under construction. The Quality Assurance Reports and construction progress photos show they were constructed with reinforced concrete roof slabs, concrete columns and brick walls.



Site Photo 18. Administrative and public checkpoints (Photo provided by USACE)

Based on our review of the QA reports, there were no reported deficiencies associated with the checkpoints' construction. The 3 July 2006 report lists the three checkpoints shown in Site Photo 18 as 95% complete.

Internal Roads and Parking Lots

The design required an internal road network and parking areas to be constructed with a 30 centimeter (cm) compacted sub-base, 8 cm asphalt concrete base and 5 cm asphalt concrete wearing surface. The design also required concrete curb and gutter for roads and parking areas. Site Photo 19 shows one section of the road network, after construction of the curb and gutter, and the asphalt concrete base course. The USACE DRE indicated the contractor would pave the asphalt concrete wearing course near the end of the project to minimize the wear and tear caused by the

construction traffic. We found no reported deficiencies regarding the road and parking lot construction in our review of the QA reports and progress photos.



**Site Photo 19. Asphalt concrete base course with concrete curb and gutter
(Photo provided by USACE).**

Satellite Imagery of the Site

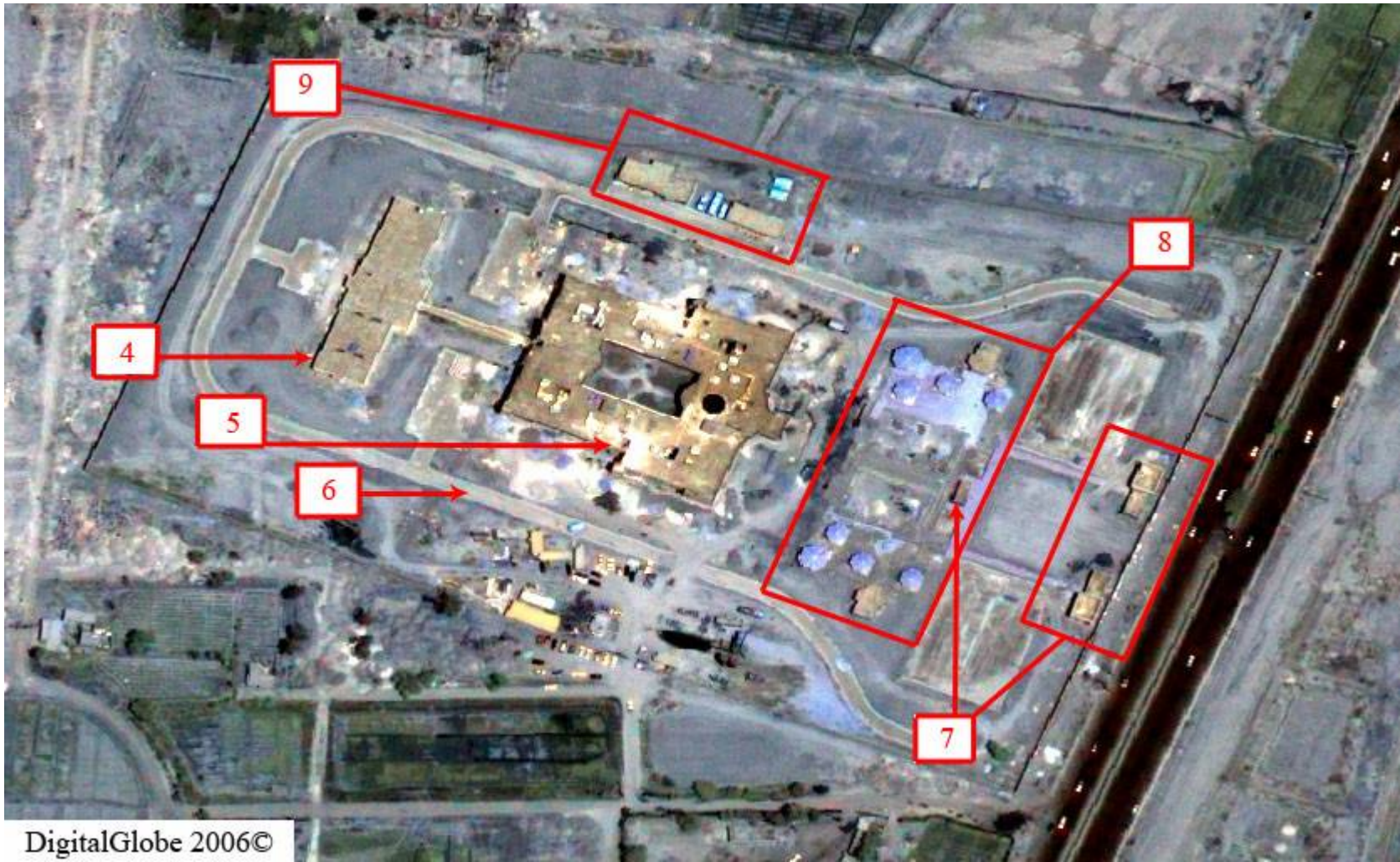
Since the assessment team was not able to travel to the site, we reviewed commercially available satellite imagery of the courthouse site to independently verify the construction progress. Aerial Image 1 shows the site on 10 August 2005 in the initial stages of construction. Item 1 is the annex building under construction. Item 2 is the road during the early stages of construction. Item 3 is the courthouse site. The darker area depicts the reinforcing steel placement for the raft foundation.

Aerial Image 2 shows the courthouse site on 16 May 2006. Item 4 shows the Annex building nearing completion. Item 5 is the substantially completed courthouse. Item 6 is the perimeter road including curb and gutter. Item 7 points to the two administrative checkpoints at the entrances and the public checkpoint within the compound. Item 8 depicts the two sets of kiosks, cafeterias, and bathroom buildings flanking the front side of the courthouse. Item 9 highlights the electrical transformer building, generators, and maintenance/water storage building.

Based on the assessment teams' review, the imagery confirms construction of the courthouse complex.



Aerial Image 1. Courthouse site on 10 August 2005



Aerial Image 2. Courthouse on 16 May 2006

Work Pending

At the time of our assessment, remaining work included the completion of the courthouse building construction, and other buildings in the complex (e.g., maintenance/water storage, cafeteria, etc). Landscaping and final paving were also required work items yet to be accomplished. Remaining work also included the requirements associated with Modification 02 for additional security features at the courthouse building. The compound's utility systems (water, sewer, and electric) also needed to be connected to the municipal systems.

Project Quality Management

Contractor's Quality Control Program

The Baghdad Al Karkh Courthouse Contract W916QW-04-D-0014, Task Order (TO) 0004, specified the contractor shall submit a quality control program 30 days after the contract is awarded or prior to starting work. In addition, the contract stated the government shall use the Resident Management System to assist in monitoring and administering the contract. The Government and the contractor shall, to the extent feasible, exchange correspondence and other documents in electronic format. The official contract record (correspondence, pay requests, and other documents) shall be provided in paper format with the appropriate dates and signatures.

After contract award, the contractor shall download the Quality Control System (QCS) from the Government's Resident Management System internet website. The Contractor Quality Control (CQC) Training will discuss the use of the Quality Control System. The contractor shall establish, maintain, and update data for the contract in the Quality Control System (QCS).

The contractor was to provide daily quality control reports generated by the Quality Control System. The contractor shall provide the Government the quality control reports using e-mail within 24 hours of the date covered by the report.

The contractor is to use the Quality Control System to maintain a record of the deficiencies. The contractor shall numerically track the quality control identified deficiencies. In addition, the government will enter its quality assurance deficiency punch list items and will export the file to the contractor.

The contractor shall develop and maintain a complete list of quality control testing, transferred and installed property, and user training requirements in the Quality Control System. The Quality Control System shall consist of plans, procedures, and organization necessary to produce an end-product that complies with the contract requirements.

The contractor submitted a QC plan to USACE in June 2005. The SIGIR inspector was unable to find any documentation to support the USACE approval of the QC plan. The plan addresses the organization of personnel involved in the implementation of the CQCP, the major components and the basis of the quality control program, a list of submittals and a discussion of the various quality control documentation requirements, a discussion on the types of inspections, tests, and monitoring systems which will be implemented to ensure quality control, a discussion on the laboratory quality assurance and quality control, and a discussion

on the CQCP system of identifying, documenting, tracking, and ensuring correction of deficiencies. We determined the contractor's QC plan met the standards addressed in Engineering Regulation 1180-1-6 (*Construction Quality Management*) or PCO Standard Operating Procedure CN-103 (*Contractor Construction Quality Control Plan*).

The contractor submitted QC reports on a daily basis, which were reviewed by the QAR and Project Engineer. These reports contained information such as work accomplished each day with the location, activity and by whom, test results, deficiencies and corrective actions, labor distribution, equipment utilized, and material received on site. In addition, the contractor prepared daily inspection checklists for each definable feature scheduled to be worked on each day. The contractor also maintained deficiency logs to document problems noted with construction/renovation activities.

Government Quality Assurance

The QAR maintained daily QA reports documenting any deficiencies noted at the site. Based on our review, we found the QAR's reports to be sufficiently complete, accurate, and timely. In addition to containing project specific information to document construction progress and highlight deficiencies, the QAR also supplemented them with detailed photographs reinforcing the narrative information provided in the reports. The USACE QAR did not maintain a QA deficiency log. However, the Project Engineer and the QAR did ensure deficiencies cited during QA inspections were corrected.

The QAR was on site almost every day managing this project. The QAR spent a significant amount of time at the project site interacting with the contractor and observing construction activities. Further, the QAR ensured that potential construction deficiencies were detected, evaluated, and properly corrected, in a timely manner.

Based on a review of the available QAR documentation, the Government Quality Assurance program appeared effective in monitoring the contractor's Quality Control program for the Baghdad Al Karkh Courthouse construction project. In addition, QA activities were sufficiently and accurately documented. This condition occurred because of the efforts of the Project Engineer and QAR during the course of the project.

The contract required the following submittals and approvals related to quality management:

- Quality control plan
- Progress meeting minutes (weekly)
- Testing and inspection reports (as necessary)

Project Sustainability

The contract adequately addressed sustainability and it appears this will result in a sustainable new courthouse. The contract included turnover of the operation and maintenance manuals; as-built drawings; technical training of personnel; and providing spare repair parts for one year. The contractor warrants the design shall perform in accordance with the contract requirements. Design and design related construction not conforming to the contract requirements shall be corrected at no additional cost to the

government. The contractor worked with the Iraqi Ministry of Housing and Construction for design and support.

Conclusions

Based upon the results of our site visit, we reached the following conclusions for assessment objectives 1, 2, 3, 4, and 5. Appendix A provides details pertaining to Scope and Methodology.

1. Determine whether project components were adequately designed prior to construction or installation.

The majority of the project components were sufficiently designed to construct the courthouse complex buildings and facilities. The design package provided to the assessment team contained site, architectural, plumbing, mechanical, and electrical design drawings, as well as detailed specifications. Gulf Region Division engineers reviewed and commented on the design drawings and the final design package integrated their comments. The assessment team determined the design package did not contain a landscape plan, typical details on interior wall and false ceiling construction, structural drawings for the administrative check points, or drawings for the generator fuel system. Notwithstanding these omissions, the design package was adequate to construct the courthouse complex buildings and facilities.

2. Determine whether construction met the standards of the design.

The assessment team was not able to visit the project site because officials at Gulf Region Division determined it was not safe for the team to travel to the site and the presence of the assessment team increased the potential danger for the Iraqis working at the site. Therefore, SIGIR's evaluation of the project construction was limited in scope. Our evaluation was based on a review of the contract file documentation including quality assurance reports and progress photos, and our interviews with United States Army Corps of Engineers, Resident Office personnel as well as interviews with Gulf Region Division-Project and Contracting Office staff. In addition, we reviewed commercially available satellite imagery of the courthouse site to independently verify the construction progress. Based on our review of the documentation provided, we found the workmanship adequate to construct the courthouse complex buildings and other facilities. We did have some concerns with the ceramic tile installation practices and the quality of the water circulation pumps, which are noted in the report. However, overall, based on our review of the contract documents, the construction from project start though 03 July 2006 appeared to meet the requirements of the design. The documentation indicated when problems were encountered with the quality of workmanship; the United States Army Corps of Engineers Resident Office staff identified deficiencies and managed the contractor's corrective actions.

3. Determine whether the Contractor's Quality Control plan and the Government Quality Assurance Program were adequate.

The contractor's Quality Control plan was sufficiently detailed to effectively guide the contractor's quality management program. Further, the contractor's daily Quality Control reports contained required project and work activity information to document construction progress and identify problems and required corrective action.

The Government Quality Assurance program appeared effective in monitoring the contractor's quality control program, based on our review of available program documentation. The Project Engineer and the Iraqi Quality Assurance Representative ensured deficiencies cited during quality assurance inspections were corrected. The Iraqi Quality Assurance Representative maintained daily quality assurance reports containing project-specific information documenting construction progress and highlighting deficiencies. In addition, the Iraqi Quality Assurance Representative supplemented the daily reports with detailed photographs reinforcing the narrative information provided in the reports.

4. Determine if project sustainability was addressed.

Sustainability was addressed in the contract requirements. The contract specifications required the contractor to provide and certify warranties in the name of the appropriate Ministry, for all equipment, which includes any mechanical, electrical and/or electronic devices, and all operations for 12 months after issuance of the Taking-Over-Certificate. The contractor was to provide any other commonly offered extended warranties for equipment and machinery purchased. In addition, the contractor was to provide two (2) sets of complete Operation and Maintenance manuals, which include all generator and equipment information, electrical single line diagrams, schematics, and maintenance information. The contractor is required to arrange for technical training, from the system manufacturer, for up to ten personnel. The contractor is required to provide spare repair parts, as recommended by the system manufacturer, for one complete year of operation. The contractor was to complete all inspection and commissioning requirements prior to the final inspection.

5. Project results were consistent with original objectives.

Based on the assessment team's review of the project documentation, the Al Karkh Courthouse construction appeared to be consistent with the intent of the project. Although we cannot say unequivocally the project results are meeting the overall objectives because of the inability to visit the site, the project results to date appear to be meeting task order objectives.

Recommendations

This report does not contain any negative findings or recommendations for corrective action. Therefore, management comments are not required.

Management Comments

The Gulf Region Division concurred with the conclusions contained in the report and provided additional information regarding the description of the facility (pre-construction) and the percentage of completion. The additional information has been incorporated into the final report.

Appendix A. Scope and Methodology

We performed this project assessment from April through July 2006, in accordance with the Quality Standards for Inspections issued by the President's Council on Integrity and Efficiency. The assessment team included a professional engineer and an auditor.

Officials at Gulf Region Division determined it was not safe for the SIGIR assessment team to travel to the Al Karkh Courthouse; in addition, the presence of the assessment team increased the potential danger for the Iraqis working at the site. Therefore, our project assessment relied solely on information obtained from:

- Reviewing contract documentation to include the following: Contract, Contract Modifications, Contract documentation, and Statement of Work;
- Reviewing the design package (drawings and specifications) and Quality Assurance Reports, Quality Control Reports;
- Interviewing the U.S. Army Corps of Engineers Deputy Resident Engineer and Quality Assurance Representative;
- Interviewing staff from the Gulf Region Division-Project and Contracting Office Facilities and Transportation Sector; and
- Reviewing commercially available satellite imagery of the courthouse site to independently verify the construction progress.

Appendix B. Acronyms

BOQ	Bill of Quantity
cm	centimeter
CQC	Contractor Quality Control
CQCP	Contractor Quality Control Plan
DRE	Deputy Resident Engineer
ER	Engineering Regulation
GRC	Gulf Region Central
GRD	Gulf Region Division
hr	hour
HVAC	Heating, Ventilation, and Air Conditioning
Km	kilometer
KVA	kilo-volt amp
m	meter
m ²	square meters
m ³	cubic meters
PCO	Project and Contracting Office
QA	Quality Assurance
QAR	Quality Assurance Representative
QCS	Quality Control System
RE	Resident Engineer
SIGIR	Special Inspector General for Iraq Reconstruction
SOW	Statement of Work
SPCO	Sector Project and Contracting Office
TO	Task Order
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

U.S. Ambassador to Iraq

Director, Iraq Reconstruction Management Office

Inspector General, Department of State

Department of Defense

Deputy Secretary of Defense

Director, Defense Reconstruction Support Office

Under Secretary of Defense (Comptroller)/Chief Financial Officer

Deputy Chief Financial Officer

Deputy Comptroller (Program/Budget)

Inspector General, Department of Defense

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)

Director, Project and Contracting Office

Commanding General, Joint Contracting Command – Iraq/Afghanistan

Commander, Gulf Region Division, U.S. Army Corps of Engineers

Assistant Secretary of the Army for Financial Management and Comptroller

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 Defense Organizations

Director, Defense Contract Audit Agency

Other Federal Government Organizations

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Comptroller General of the United States
Inspector General, Department of the Treasury
Inspector General, Department of Commerce
Inspector General, Health and Human Services
Inspector General, U.S. Agency for International Development

Congressional Committees and Subcommittees, Chairman and Ranking Minority Member

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 Subcommittee on Foreign Operations
Senate Committee on Armed Services
Senate Committee on Foreign Relations
 Subcommittee on Near Eastern and South Asian Affairs
 Subcommittee on International Operations and Terrorism
Senate Committee on Homeland Security and Governmental Affairs
 Subcommittee on Government Efficiency and Financial Management
 Subcommittee on Financial Management, the Budget, and International Security

U.S. House of Representatives

House Committee on Appropriations
 Subcommittee on Defense
 Subcommittee on Foreign Operations, Export Financing and Related Programs
House Committee on Armed Services
House Committee on International Relations
 Subcommittee on Middle East and Central Asia
House Committee on Government Reform
 Subcommittee on Government Efficiency and Financial Management
 Subcommittee on National Security, Emerging Threats and International Relations

Appendix D. 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:

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