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# SIGIR Oversight

SIGIR AUDITS  
SIGIR INSPECTIONS  
SIGIR INVESTIGATIONS  
SIGIR HOTLINE  
SIGIR LESSONS LEARNED INITIATIVE  
SIGIR WEB SITE  
ANTICORRUPTION INITIATIVE

SECTION

3



## SIGIR INSPECTIONS

This quarter, SIGIR inspection teams continued to conduct inspections and assessments of reconstruction projects throughout Iraq to determine and report on the adequacy of work planned and accomplished. SIGIR has now completed 42 project assessments and 97 limited on-site inspections.

The growing visibility of SIGIR is having a positive impact throughout Iraq. Contractors and subcontractors are well aware that their project sites are subject to on-site inspections by SIGIR teams with limited advance notice, and this promotes efficiencies.

Many of the projects that SIGIR assessed this quarter were of high quality and showed good controls and quality assurance programs. Some SIGIR assessments show that certain contractor performance continues to be a problem. At several project sites, contractor-required quality control and government quality assurance programs were inadequate. Deficient concrete construction continues to be a major concern at a number of projects.

These are the projects that SIGIR assessed this quarter and an overview of the results.

### Project Assessments: Findings at a Glance

#### Five Primary Health Care Centers (\$2.7 million)

- These projects will not meet the objectives.
- These projects had inadequate contractor quality control.
- These projects had inadequate government quality assurance.

- These projects had concrete deficiencies that may potentially result in safety issues.

#### Fire Station New Construction (\$1.3 million)

- This project should meet its objective.
- There are unresolved concrete quality and structural issues.
- The project had an adequate contractor quality control program and government quality assurance.

#### Aviation Base Building (\$2.25 million)

- This project met its objectives, and the building is in use.
- The government quality control was inadequate.
- The project had poor-quality electrical, plumbing, and finishing work.

#### Ninewa Village Roads (\$0.92 million)

- This project should meet its objective.
- The design was not sufficient.
- Contractor quality control was inadequate.
- Government quality assurance was adequate.

#### Zakho Military Academy (\$5.8 million), Erbil City Transformers (\$3.4 million), Primary School Dahuk (\$0.4 million), New 2<sup>nd</sup> Brigade Base (\$114.0 million), and Air Traffic Control Tower (\$10.3 million)

- All five projects should meet their objectives.
- Contractor quality control was adequate.
- Government quality assurance was adequate.

- Design was sufficient for all projects.
- Quality was within contract requirements.

## Limited On-site Inspections

### 17 New Border Posts

- The quality of concrete is a concern.
- SIGIR found a lack of retaining walls.
- Of the 17 projects, 7 lacked perimeter security.

### 5 MNSTC-I Border Forts

- No documentation is available regarding the contracts, statements of work, or designs.
- All five were of poor quality renovation and showed no signs of recent maintenance.

### 3 Educational Facilities

- SIGIR found poor quality in certain areas.
- SIGIR found substandard material.
- The renovation was not comprehensive.

### 6 Medical Facilities

- SIGIR found no significant issues.

### 21 Public Safety Projects

- SIGIR found many electrical, plumbing, and finishing quality deficiencies.

### 3 Transportation Projects

- SIGIR found no significant issues.

## Approach to Assessment

During this quarter, SIGIR teams assessed 13 project sites. To accomplish these assessments, the teams gathered contractual specifications,

traveled to the project sites, examined on-site efforts and accomplishments, and reviewed their results with reconstruction managers. Each assessment team consisted of an engineer and auditor.

While the assessment teams were conducting project assessments and summarizing the results of limited ground project surveys, other SIGIR personnel were conducting preliminary assessments of 42 additional construction projects. SIGIR shares this information with project management staff to select projects for more in-depth assessments.

During the second quarter of 2005, SIGIR established a satellite imagery operation to conduct analyses on projects that are remote or inaccessible because of security concerns. This operation also assists the project assessment teams with preliminary research of site progress. This quarter, SIGIR continued to expand its satellite imagery operation, conducting 58 imagery assessments of sites throughout Iraq. The SIGIR Satellite Imagery Group conducted these 58 imagery assessments with assistance from the National Geospatial-Intelligence Agency (NGA) and the National Ground Intelligence Center (NGIC).

## Planning

SIGIR selected from each of the major sectors a cross-section of projects to assess, survey, and analyze, including:

- projects involving water, electricity, oil, facilities and transportation
- projects involving large and small contract amounts

- projects of different general contractors
- projects in different sections of the country
- projects in programs of each of the major U.S. agencies
- projects that were fully completed and partly completed
- construction and non-construction projects

### On-site Project Assessment Program Approach

Since it was created in June 2005, SIGIR Inspections has completed 42 project assessments. During this quarter, SIGIR inspected and completed assessments of 13 project sites. These were the general objectives of the project assessments:

- Were project results consistent with the original objectives?
- Were project components adequately designed before construction or installation?
- Did construction or rehabilitation adequately meet the standards of the design?
- Were the contractor's quality control plan and the U.S. government's quality assurance program adequately carried out?
- Were project sustainability and operational effectiveness adequately addressed?

Table 3-2 lists project assessments completed this quarter. Table 3-3 lists project assessments completed in previous quarters. Figure 3-1 shows the approximate location of each project in Iraq.

### SIGIR Project Assessments

#### Primary Healthcare Centers

##### Near Kirkuk, Iraq

SIGIR-PA-06-42—06-46

The October 2005 SIGIR Quarterly Report to Congress highlighted a project assessment (SIGIR-PA-2005-016) of a single primary healthcare center (PHC) in Hillah. That assessment showed significant construction and quality assurance problems. At the time of the visit, corrective action had not been proposed or approved. The contractor stated that it was developing procedures to increase quality control for concrete. The contractor, PCO, and USACE were working to develop corrective actions. Although only one clinic was assessed at that time, the Prime Contractor was responsible for 142 clinics nationwide.

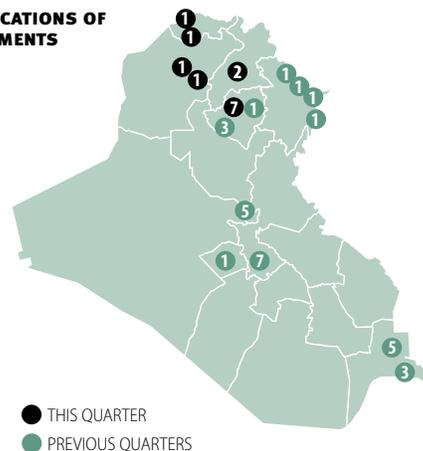
Based on the results of SIGIR-PA-2005-016, SIGIR assessed five more clinics in February 2006 to determine the extent of construction and quality control issues. The SIGIR team visited five PHC construction sites in February 2006. The reported cost for these five projects was \$2.7 million. The original objective was to provide public health sector facilities and employment to the Iraqi people and more specifically, to construct PHCs in northern Iraq to increase health care to the Iraqi population.

## THIRTEEN PROJECTS ASSESSED IN THIS QUARTER (DOLLARS IN THOUSANDS)

PCO ID	PROJECT NAME	GOVERNORATE	BUDGETED TOTAL COST	EXECUTING AGENCY	CONTRACTOR	GRD REGION
12637	Mosul Airport—Air Traffic Control Tower Rehab	Ninewa	\$10,329	GRD	Foreign	North
17846	Ninewa Village Roads Segment 3	Ninewa	\$920	GRD	Foreign	North
6176	Ainkawa Fire Station	Erbil	\$1,392	GRD	Parsons Global Services, Inc.	North
5623	Erbil City Transformers	Erbil	\$3,372	GRD	Washington International, Inc.	North
18922	Sheile Primary School	Dahuk	\$401	GRD	Foreign	North
19144	Zakho—Military Academy	Dahuk	\$5,591	GRD	Foreign	North
11937	Public Health Care Clinic Type A at Shiqaq Hai Musalla	Tameem	\$608	GRD	Parsons Delaware, Inc.	North
11936	Public Health Care Clinic Type A at Hai Alhajjaj	Tameem	\$608	GRD	Parsons Delaware, Inc.	North
11940	Public Health Care Clinic Type A at Hai Alasra Wa Al Mafqoodeen	Tameem	\$648	GRD	Parsons Delaware, Inc.	North
11939	Public Health Care Clinic Type A at Hai Al Wasiy	Tameem	\$648	GRD	Parsons Delaware, Inc.	North
11938	Public Health Care Clinic Type B at Hai Tis'een	Tameem	\$734	GRD	Parsons Delaware, Inc.	North
23160	New Second Brigade Base	Tameem	\$114,000	AFCEE	Environmental Chemical Corporation	North
20645	Aviation Base Building	Tameem	\$13,200	AFCEE	Environmental Chemical Corporation	North

TABLE 3-2

Figure 3-1  
**APPROXIMATE LOCATIONS OF PROJECT ASSESSMENTS**



THE 29 PROJECTS ASSESSED IN PREVIOUS QUARTERS (DOLLARS IN THOUSANDS)

PCO ID	PROJECT NAME	GOVERNORATE	BUDGETED TOTAL COST	EXECUTING AGENCY	CONTRACTOR	GRD REGION
19158	Hillah SWAT Facility	Babylon	\$2,219	GRD	Foreign	South
18427	Seif Sa'ad Police Station	Babylon	\$153	GRD	Foreign	South
12883	Border Post--As Sul #37-- Bnawasuta-Issawa	Sulaymaniyah	\$272	GRD	Parsons Delaware	North
12787	Border Post--As Sul #29-- Kuralau Bnaw-Azmik	Sulaymaniyah	\$275	GRD	Parsons Delaware	North
12840	Border Post--As Sul #20--Marwa	Sulaymaniyah	\$272	GRD	Parsons Delaware	North
12855	Border Post--As Sul #23-- Bargurd-Safrah	Sulaymaniyah	\$272	GRD	Parsons Delaware	North
18638	Military Base Um Qasr--Ammo Supply Point	Basrah	\$253	GRD	Foreign	South
21196	Operation Center and Security	Basrah	\$1,175	GRD	Foreign	South
21304	Port of Umm Qasr Security Upgrades	Basrah	\$3,747	GRD	Foreign	South
19071	Project Phoenix--Restore Qudas Gas Turbines	Baghdad	\$11,391	PCO	FluorAmec	Central
Life Support Contract	Al Hillah Police Academy--CN W914NS- 04-C-9046	Babylon	\$9,135	JCC-I/A	Foreign	South
4 DFI Contracts	Karbala Library	Karbala	\$1,294	CPA (South Central)	Global Business Group	South
3532	Al Wahda Water Treatment Plant	Baghdad	\$4,712	PCO	FluorAmec	Central
3529	Al Wathba Water Treatment Pant	Baghdad	\$8,698	PCO	FluorAmec	Central
18462	Al Nahrwan Water Supply Project	Baghdad	\$348	GRD	Foreign	Central
18079	Al Sumelat Water Network	Baghdad	\$764	PCO	SIMA International	Central
1654	Al Hakamia Substation	Basrah	\$5,934	PCO	Perini Corporation	Central
1657	Hamdan Substation	Basrah	\$5,001	PCO	Perini Corporation	Central
1655	Al Kaffat Substation	Basrah	\$5,934	PCO	Perini Corporation	Central
1656	Al Seraji Substation	Basrah	\$5,709	PCO	Perini Corporation	Central



PCO ID	PROJECT NAME	GOVERNORATE	BUDGETED TOTAL COST	EXECUTING AGENCY	CONTRACTOR	GRD REGION
1659	Shut Al Arab Substation	Basrah	\$5,298	PCO	Perini Corporation	Central
18183	Al Fathah Pipe Crossing	Tameem	\$29,715	PCO	Parson PJIV	North
18185	Kirkuk Canal Crossing	Tameem	\$2,088	PCO	Parson PJIV	North
19604	Al Fathah River Crossing Tie-ins	Tameem	\$8,156	PCO	Parson PJIV	North
19250	Al Balda Police Station	Babylon	\$135	GRD	Foreign	South
13607	Al Hillah Maternity and Children's Hospital	Babylon	\$7,414	PCO	Parsons Global Services	South
11812	Al Imam Primary Care Center	Babylon	\$533	PCO	Parsons Delaware	South
21950	Babil Railway Station	Babylon	\$274	PCO	Foreign	South
DFI	Horizontal Drilling	Tameem	\$75,500	GRD-PCO	KBR	North

TABLE 3-3

## What We Found

SIGIR concluded that project results were not consistent with original objectives in view of these facts:

- The five PHCs SIGIR assessed were far from complete and were poorly constructed.
- Construction deficiencies raised questions about the safety of occupancy of the structures.
- SIGIR was informed that the contract for PHC construction was to be terminated,

and that only 20 of the original 150 PHCs were to be completed under the contract.<sup>11</sup>

- The five PHCs that SIGIR assessed were not to be included in the 20 PHCs to be completed under the modified contract.

The construction did not meet the international standards required by the contract. SIGIR documented several areas of inferior quality construction during the on-site inspections. Inadequate quality control and quality assurance on the part of the contractor and

the U.S. government, respectively, resulted in not properly identifying and correcting construction deficiencies. At the time of the SIGIR inspections, the projects consisted of concrete columns, beams, ceiling slabs, x-ray room walls, and stairwells. Reinforced concrete did not appear to be constructed to contract specifications and needed to be evaluated to determine whether corrective actions were required. Corrective action pro-



Reinforced load-bearing column out of plumb

cedures have not been submitted or completed, even though the quality assurance representative for the U.S. Army Corps of Engineers (USACE) documented concrete deficiencies.

SIGIR identified concrete segregation, voids, rebar exposure on the surface of the load-bearing reinforced concrete ceiling beams, and columns with chipped concrete. A reinforced load-bearing column was noticeably out of plumb. Also, SIGIR identified many defects in workmanship of the non-load-bearing walls, such as gaps in the walls and improper and uneven brick placement. Instead of correcting each defect, the walls were plastered over with gypsum. In one instance, a concrete stairwell was in place; however, the workmanship of the concrete was poor. The surface was uneven, small pieces of the stairs were chipped off, and concrete segregation was visible on the side and underneath the stairwell. Furthermore, a lintel—a load-bearing support above windows and doors—was not properly installed.

In addition to the construction deficiencies observed, the contractor quality control plan and the government quality assurance plan were not adequate. The contract specified requirements for a contractor quality control plan and procedures, which the contractor submitted. However, the quality control daily reports were generic. They lacked any site-specific or task-specific details or details of the subcontractors' job qualifications, and test plans did not contain a subcontractor organizational chart.

The daily quality control reports were inadequate and did not disclose concrete issues that



Concrete segregation on underside of reinforced concrete stairwell

Segregation of load-bearing reinforced concrete ceiling beam





Example of concrete block work for non-load-bearing walls

Improperly installed lintel



could require corrective actions. Additionally, the contractor did not have quality control deficiency logs for four of the five PHCs, and the one deficiency log that was available did not provide sufficient information to ensure that the potential construction deficiencies that were detected were evaluated and properly corrected quickly. Further, the quality assurance program was inadequate. USACE did not provide adequate oversight. These are some examples of the inadequate oversight:

- insufficient daily quality assurance reports to document the identification and correction of concrete issues
- lack of independence
- insufficient review of contractor invoices before payment

In response to our draft report, USACE noted that the objectives, conclusions, and recommendations were inconsistent. And, while disagreeing with statements made in the draft report and opining that SIGIR had not adequately considered the security situation in Iraq, the USACE allowed that the report contained valid points, but that recommendations should be directed only to the five PHCs reviewed by SIGIR. The USACE did not concur with the recommendations because they addressed the entire PHC program.

SIGIR will work with USACE representatives to resolve areas of dispute. However, in view of the termination of the task orders for the construction of 141 PHCs (with only 20 to be completed), SIGIR continues to believe that



New headquarters building

recommendations that address the entire PHC program are appropriate.

### Zakho Military Academy

SIGIR-PA-06-039

The Zakho Military Academy project included building renovation work, as well as the construction of new buildings and other facilities with a contract cost of \$5.8 million. When assessed, the project was reported as 96% complete. Specifically, the project consisted of the renovation of the existing training building, two dining facilities, and the Academy's swimming pool. The project also included construction of a headquarters building, a barracks, a water treatment plant and distribution system, a wastewater treatment plant and collection system, a three-kilometer extension of the perimeter security wall, a track and soccer field, an obstacle course, a concrete parade field with stadium lighting, and the development of a water well.

### What We Found

The assessment team found that the construction and renovation project results were consistent with the original task order objectives. All project components were adequately designed prior to construction. The plans and specifications provided an accurate depiction and adaptation of the design to existing site conditions.

The government quality assurance program was effective in monitoring the contractor's quality control program. The USACE project engineer and the quality assurance representative ensured that all deficiencies cited during quality assurance inspections were corrected. The quality assurance representative also maintained daily quality assurance reports that contained project specific information to document construction progress and highlight deficiencies.

The assessment team found that the construction and equipment installation workmanship was of high quality. A major factor

contributing to the success of the project was that the USACE project engineer and quality assurance representative lived and worked at the military academy and were fully engaged in daily construction activities to ensure quality and compliance with the task order requirements.

#### **Sustainability**

In addition, sustainability was adequately addressed in the task order requirements, particularly for the water and wastewater treatment plants. They were designed as “packaged plants” for simplicity in operation and maintenance. The design also required manufacturer’s training on the plants’ components, as well as a spare parts list, and operations and maintenance manuals.

#### **Air Traffic Control Tower and Navigational Aids—Mosul, Iraq**

SIGIR-PA-06-034

The project scope included the construction of an Air Traffic Control (ATC) Tower facility, including an 8-level, 25-meter-high tower structure and an adjoining 2-story administration building at the Mosul Airport. The navigational and visual aids part of the project included construction and the installation of equipment such as the Doppler VHF Omni Directional Radio Range with Distance Measuring Equipment, Glide Slope/Precision Approach Path Indicator, and a High Intensity Approach Lighting System at each end of the runway. Also, the other major part of the project scope was an upgrade of the electrical distribution system. The objective of the upgrade was to provide reliable electrical power for



Swimming pool with new barracks in the background at Zahko Military Academy



Packaged wastewater treatment plant at Zahko Military Academy

the ATC facility, navigational aids, and airfield lighting systems by building in redundancy with the electrical power grid at the airport, and by installing emergency backup electrical generators.

### **What We Found**

The PCO database reported the project as 46% complete at the time of the assessment. The SIGIR assessment team found that this \$10.3 million project is being constructed in a manner that is consistent with the contract objectives and in accordance with the plans and specifications. The team concluded that the project components were adequately designed, and construction and installation of the ATC Tower and navigational and visual aids should meet the standards of the design.

A significant positive factor contributing to the high-quality workmanship on the project included the contractor's concrete operations. The amount of concrete needed to construct the facility necessitated the utilization of materials, equipment, and processes that could produce consistent mix proportions when batching concrete. The contractor erected its own batch plant, drilled and developed a well for a ready supply of water for concrete, and set up a concrete materials testing lab. The contractor's process controls at the batch plant and their active testing program resulted in the production of high-quality structural concrete for the ATC Tower facility.

The high-quality workmanship can also be attributed to the government's quality assur-

ance program. The USACE quality assurance representatives were on site every day in managing the project, spending a significant amount of their time at project sites, interacting with the contractor, and observing construction activities. Although much of the project work was taking place on or near the active runway and taxiway, the quality assurance representatives closely coordinated with airport operations personnel to ensure the contract work could proceed with minimal impact to air operations.

### **Sustainability**

The assessment team also found that sustainability was adequately addressed in the task order requirements. The task order required warranties on installed equipment and operations for a 12-month period, as well as operations and maintenance manuals, spare parts list, and classroom and hands-on training.

### **Ninewa Village Roads, Ninewa, Iraq**

SIGIR-PA-2006-035

A SIGIR assessment team conducted a site inspection of a village roads project approximately 25 kilometers (km) east of the city of Mosul. The specific objective was to convert 16 km of dirt roads to six meter (m) wide, two-lane paved roads from the village of Nimrud to the village of Balawat and from the village of Balawat to the village of Al Hamdaniya. This \$920,000 project required construction of a 10 centimeter (cm) asphalt concrete road surface



Mosul ATC Tower at the time of SIGIR assessment



Concrete batch plant to mix concrete



Asphalt concrete pavement near village of Balawat

layer over a 30 cm thick aggregate base. The project also required constructing 1.75 m soil shoulders, and the construction of reinforced concrete pipe culverts and the extension of existing box culverts.

At the time of the SIGIR assessment, the project was reported to be 67% complete. When completed, the project should meet and be consistent with the original contract objectives, if current construction methods are continued. The completed project should result in a paved two-lane asphalt concrete road connecting the villages of Al Hamdaniya, Balawat, and Nimrud.

### What We Found

Although construction appeared to meet the standards, the SIGIR team found problems with the design drawings. The design included only basic cut-and-fill roadway cross-sections, typical details on reinforced concrete pipe culverts, curbs, and retaining walls, but no details on box culverts. Further, there were no drawings showing the plan views of the road-



Extension of existing box culvert

way or culvert locations. In addition, although the contract required compliance with the Iraq Standard Specifications for Roads and Bridges, the USACE Resident Engineer Office did not have a copy.

These problems notwithstanding, all work observed appeared to be consistent with the intent of the project. A major reason the project stayed “on target” was that the USACE resident engineer and the quality assurance representative were experienced with road construction and effectively monitored and supervised the construction efforts of the contractor.



Honeycombing and exposed rebar in concrete—photo provided by U.S. Army Corps of Engineers



Honeycombing after surface coating



Close-up of honeycomb area

**Fire Station Construction, Ainkawa, Iraq**  
SIGIR-PA-2006-036

The project objective was the design and construction of a fire station in Ainkawa, Iraq in order to provide emergency fire protection services needed in an underserved area within the Erbil governorate. The fire station is a 1,020

square meter, four level building constructed with structural reinforced concrete (columns, beams, slabs, and shear walls) and block walls finished with a painted cement-sand exterior coating. The fire station was designed to house three fire trucks, as well as two sport utility vehicles. The design also included a training room, berthing areas for 20 firefighters, a kitchen and dining room for 30 people, office space, bathrooms, and storage space.

**What We Found**

At the time of the SIGIR assessment, the project was reported as 49% complete. Almost all of the structural concrete columns, beams, shear walls, floor and roof slabs were constructed and most of the exterior and interior concrete block walls had been completed.

This \$1.3 million project has three unresolved issues associated with the design and construction that required management attention. Two of the three pertain to the concrete construction. The structural concrete had problems with honeycombing<sup>12</sup> and exposed rebar in columns and shear walls, particularly in locations on the first level. As a result, there are concerns regarding the structural integrity of the building. The contractor conducted



Exterior view of the Ainkawa Fire Station

ultrasound testing of the structural elements (columns, beams, and shear walls) in attempting to determine their strength, which was then analyzed by the contractor's structural engineering consultant. Although the government requested the contractor to certify that the structural elements had achieved full design strength, no certification of the contractor's testing and analysis had been submitted.

The other concrete issue is related to the corrective action taken by the contractor to repair the honeycomb areas. The contractor repaired these areas utilizing a rich cement-sand patch, instead of using a recommended epoxy grout patching material to repair the voids. It remains a durability issue that must be resolved by USACE and the contractor.

The third unresolved issue pertains to the responsibility for driveway, sidewalk, and perimeter wall construction. According to the language of the task order and the 30% design submission, the contractor was responsible for constructing driveways, sidewalks, and perimeter walls. However, based on the assessment team's review of the 90% design and discussions with the contractor, these items have been removed from the Scope of Work (SOW). The driveways, sidewalks, and perimeter walls are integral to a complete and usable facility. If they are not the contractor's responsibility to construct, the Iraq Ministry of Interior needs to be informed so the Ministry will have enough lead time to plan and construct them.

As a result of these three unsettled issues, the assessment team could not conclude

whether the fire station, when completed, will meet the original project objectives.

### **Erbil City Transformers, Erbil, Iraq**

SIGIR-PA-06-037

The Erbil City Transformer project was one of 14 ongoing or completed electrical distribution system improvement projects within the Erbil governorate. The scope of the Erbil City Transformer project included the upgrade of the existing electrical distribution system by installing and connecting 144 three-phase, 11kV-400V/230V transformers on existing or new H-poles in various areas within the Erbil



Transformer and low voltage electrical distribution panel



Preparing fuse cutouts on H-pole prior to setting



11kV-400V/230V transformers at contractor's storage facility

governorate, as well as providing new electrical distribution service to, and from, the new transformers. The project construction involved the placement of 428 new galvanized steel poles, stringing and connecting low and medium voltage overhead aluminum conductors and cable, and the installation of platform mounted 11kV-400V/230V transformers and low voltage distribution panels on the H-poles.

**What We Found**

This project has a cost of more than \$3.4 million. At the time of our assessment, the project was reported as 55%

complete. The assessment team found that the project results will very likely be consistent with the original objectives, because the design and construction practices conformed to the requirements. During the site visit, our team observed good construction practices and effective project management.

The government quality assurance program was effective in monitoring the contractor's quality control program and construction activities. In addition, the USACE resident engineer and quality assurance representative ensured that all deficiencies cited during quality assurance inspections were corrected. Further, quality assurance reports contained project specific information to document construction progress and highlight deficiencies and were supplemented with detailed photographs that reinforced the narrative information provided in the reports.

If current construction practices are continued, the existing electrical distribution system in Erbil will be significantly improved because of the upgrades and added service provided by this project.

### **Sustainability**

Sustainability was adequately addressed in the task order requirements. The task order required a 12-month warranty on all equipment and operations and required the contractor to provide all as-built drawings, preventive maintenance plans and operations, and maintenance manuals for installed equipment, which included the 11kV–400V/230V transformers. These will be provided to the Erbil

Governorate Ministry of Industry and Energy upon completion of the project.

### **Primary School, Dahuk, Iraq**

SIGIR-PS-2006-038

SIGIR assessed the construction of a 12-classroom primary school in Dahuk, Iraq.

The SIGIR assessment team determined that the completed project will be consistent with contract plans and specifications. The design of the school was based on an existing UN design for primary schools used during the Oil-for-Food program. The school, when completed, is expected to accommodate approximately 800 students from first to sixth grades. The teaching staff is expected to range from 35 to 38 teachers.

The project included construction of the main school building and an auxiliary building containing bathrooms for students and a room for concessionaire operation. The project also included a paved basketball court, a play area, a garden area, and a generator building.

### **What We Found**

At the time of the SIGIR assessment, the project was reported to be 80% complete and was budgeted at \$401,000 for construction cost. The main school building containing the classrooms, assembly room, office space, and the auxiliary building were substantially complete. Interior finishes such as doors, windows, and terrazzo tile flooring were installed. Interior walls and the ceilings in each room were gypsum-plastered and painted. Electrical outlets, light fixtures, and ceiling fans were installed

in each classroom and workroom. Roof-top water storage tanks and interior plumbing for the bathrooms and exterior hand wash areas were also complete. Remaining work included completion of the generator building, exterior site work to construct the garden and play areas, and the construction of the basketball court.

Based on the assessment, SIGIR determined that the quality of the workmanship on the school construction was good. The USACE project engineer and quality assurance representative effectively managed the project. They were frequently on site during construction and provided sufficient oversight to ensure that adequate quality control was maintained.

The school will be commissioned and delivered to the Iraqi Ministry of Education after the final inspection and all punch list items are resolved. Sustainability issues are not signifi-

cant because of limited maintenance requirements. No equipment requirements existed in the contract beyond basic lighting and ceiling fans. Equipment such as desks, tables, chairs, and a backup generator are the responsibility of the Ministry of Education.

#### **New 2<sup>nd</sup> Brigade Base in Kirkuk, Iraq**

SIGIR-PA-06-041

The assessment team visited this new \$115 million Iraqi military base. The completed project was consistent with original objectives. At the time of the SIGIR assessment, the facilities were in use for the intended objectives. This project consisted of almost entirely new construction of perimeter security, roadways, small arms ranges, barracks, dining facilities, water systems, wastewater systems, and electrical generation.



Entrance to the primary school in Dahuk

## What We Found

The contract required submission and approval of design drawings and specifications for the construction. Based on review of contractor and the Air Force Center for Environmental Excellence (AFCEE) project files, the design was sufficient to complete the project to Iraqi standards. In addition, the contractor obtained



Soccer field with barracks in background



Interior of one of the four dining facilities

design and support services from the Iraqi Ministry of Housing and Construction.

The contract included the turnover of the operation and maintenance manuals, as-built drawings, local procurement of parts and equipment, technical training of personnel, a one-year warranty for all equipment and operations, and provided spare repair parts for one year. A review of the 2<sup>nd</sup> Brigade facility showed that it was operating in accordance with the SOW's specific objective for a functional facility.

At the time of the assessment the earthwork appeared complete. Asphalt roads, concrete sidewalks and parking areas, gravel pads, parade grounds, and soccer fields appeared to meet the contractual requirements and were in use. Underground utilities were adequately installed and operational. The small arms ranges appeared to be well drained and constructed with baffles so that if they were used correctly, bullets could not go over the backstop berms. Construction work was complete on the motor pool and the street lighting system. The motor pool was fully stocked with equipment and was in use for the intended purpose. Construction on the four dining facilities was complete and some of the facilities were in use. The selection and fabrication of the wastewater treatment system was complete and the system was in use. The treatment system used physical, biological, and chemical processes to purify the water before discharge. The plant appeared to be well constructed and easy to operate.



Six-bay operational automobile maintenance facility



Wastewater treatment plant

**Sustainability**

The contract addressed sustainability and should result in a sustainable Iraqi Army facility.

**Aviation Base Building in Kirkuk, Iraq**  
SIGIR-PA-06-040

The objective of the aviation base building project was to construct a hangar, fuel tanks, and an operations building at an air base to support and train Iraqi Air Force personnel. The SIGIR team determined that the completed new construction project was consistent with original task order objectives. The aviation building and operations center facilities were in use for their intended purposes at the time of the assessment.

**What We Found**

The project consisted of new construction and the contract and task order required submission and approval of design drawings and

specifications for the new construction. Based on the review of contractor and the AFCEE project files, the design was sufficient to complete these projects to Iraqi standards.

The contract’s SOW required the contractor to prepare a site-specific quality program plan for AFCEE review and approval. The contractor submitted a construction quality control plan to the U.S. government. The contractor did provide daily quality control reports, test results, and invoices that provided adequate detail to the U.S. government.

The U.S. government’s quality assurance program was not adequate. It appeared that there was limited, if any, oversight by either USACE or AFCEE for the aviation hangar and barracks/operations center building. According to the U.S. Air Force personnel attached to the end users of this project, the 3<sup>rd</sup> Squadron of the Iraqi Air Force, the quality assurance was, at best, “questionable” and, at worst, non-existent. As a result, significant deficiencies

were not identified and corrected before sign-off and turnover to the Iraqi Air Force—most notably an electrical fire in the aviation hangar.

At the time of the SIGIR assessment, construction was complete on the hangar, and there was a pending list of deficiencies to be repaired under warranty. SIGIR found problems, such as leaks at the windows and discrepancies with the plumbing, electrical system, and general workmanship. The contract did contain requirements for final inspections and warranties, which should resolve the construction deficiencies identified.

### Sustainability

The contract satisfactorily addressed sustainability, and the completed project should result in an aviation and operations facility that is both operational and sustainable. The contract included the turnover of the operation and maintenance manuals, as-built drawings, local procurement of parts and equipment, technical training of personnel, a one-year warranty for all equipment and operations, and providing spare repair parts for one year. The contractor worked with the Iraqi Ministry of Housing and Construction for design and support.



Interior of aviation hangar with Iraqi aircraft



Exterior view of aviation hangar

## Limited On-site Inspection Program

The limited on-site inspection program is the second component in SIGIR's program for inspecting construction at specific sites. This program is an important part of SIGIR's efforts to ensure the broadest possible coverage of all construction sites in Iraq.

The limited on-site inspection program involves conducting more general on-site inspections of project construction sites, noting deficiencies, assessing overall progress, and taking photographs. The information is subsequently analyzed for contract compliance, shared with program management, and used to identify locations for more detailed engineering assessments.

Since the program began in September 2005, SIGIR has conducted limited on-site

inspections at 97 projects. This section summarizes and analyzes 55 of the projects for which limited on-site inspections were completed in the quarter that ended December 31, 2005. SIGIR is currently analyzing the remaining 42 projects and plans to present them in the July 2006 Quarterly Report.

The 55 projects analyzed and reported this quarter include 22 border posts, 3 educational facilities, 6 medical facilities, 21 public safety projects, and 3 transportation projects in northeast Iraq and throughout southern Iraq. Table 3-4 lists the individual projects being reported this quarter. Table 3-5 lists the 42 projects that will be analyzed and reported next quarter. Figure 3-2 shows the approximate locations of all 97 projects assessed.

## PROJECT SURVEYED, ANALYZED, AND REPORTED THIS QUARTER

PCO PROJECT NUMBER	PROJECT NAME	GOVERNORATE
11943	Clinic in Thi-Qar at Sukkar	Thi-Qar
19220	Police Station Checkpoint–Islah Shebayish D 409	Thi-Qar
19218	Police Station Checkpoint–Suk Ash Shuyuck D408	Thi-Qar
19219	Police Station Checkpoint–Tallil Lahem D407	Thi-Qar
19990	Police Station–Suk Al Shiyoock D144	Thi-Qar
10630	School #1800425, al Shatrah School	Thi-Qar
10613	School #1800809, Intifadha	Thi-Qar
10588	School #1800869, Al-Salam School	Thi-Qar
17867	Thi-Qar Village Roads, Segment 3 Hahin Al Dukhi (7.1 km)	Thi-Qar
11941	Clinic in Thi Qar Al Zahra	Thi-Qar
10072	South Site Fire Station New Nasiriyah	Thi-Qar
10318	Maternity & Pediatric Hospital (Al - Nasiraya)	Thi-Qar
12781	Border Post–As Sulaymaniyah #03	Sulaymaniyah
20560	Border Post–As Sulaymaniyah #53	Sulaymaniyah
12787	Border Post–As Sulaymaniyah #29	Sulaymaniyah
20567	Border Post–As Sulaymaniyah #57	Sulaymaniyah
20568	Border Post–As Sulaymaniyah #65	Sulaymaniyah
20565	Border Post–As Sulaymaniyah #45	Sulaymaniyah
12840	Border Post–As Sulaymaniyah #20	Sulaymaniyah
12141	Border Post–Basrah #14 Al Mutawwi'ah	Basrah
12144	Border Post–Basrah #12 Kut Al Bandar	Basrah
12801	Border Post–As Sulaymaniyah #10	Sulaymaniyah
12145	Border Post–Basrah #11 Khut Abu Ikab Reno	Basrah
12842	Border Post–As Sulaymaniyah #21	Sulaymaniyah
12161	Border Post–Basrah #04 - Kut Ubayd	Basrah
20569	Border Post–As Sulaymaniyah #64 - Sele	Sulaymaniyah
12802	Border Post–As Sulaymaniyah #11	Sulaymaniyah
1270	Al Diwaniyah Maternity & Children's Hospital (Qadissiya)	Qadissiyah
17783	Basrah Village Roads Segment 2 Talha (3.5 km)	Basrah
12800	Border Post–As Sulaymaniyah #9	Sulaymaniyah
12856	Border Post–As Sulaymaniyah #24	Sulaymaniyah
12142	Border Post–Basrah #13 - Anajin E Divan	Basrah
12149	Border Post–Basrah #10 - Ras Al Bishah	Basrah
11897	Clinic in Najaf–Hai Kinda	Najaf
19217	Police Station–Checkpoint–Tampa-Jackson–D405	Thi-Qar
20347	Police Station–TSU Barracks Phase I-D414	Thi-Qar
18243	Police Station–Al Huwayr–Al Madinah–B044	Basrah
20333	Police Station–Al Nassiriyah–Anti-crime IPA–D156	Thi-Qar

PCO PROJECT NUMBER	PROJECT NAME	GOVERNORATE
19222	Police Station–Checkpoint–Nasir–D411	Thi-Qar
18346	Police Station–Diwaniya–Traffic Police–Q066	Qadissiyah
19114	Police Station–Al Nassiriyah–Police Intelligence–D145	Thi-Qar
19221	Police Station–Checkpoint–Nassiriyah Prison–D410	Thi-Qar
12137	Border Post–Basrah #17–Al Haddidayah	Basrah
18241	Police Station–Al Mdeina–B029	Basrah
19480	Police Station–Al Quibla–B043	Basrah
18263	Police Station–AZ Zubayr–B038	Basrah
21251	Basrah Railway Station Rehabilitation	Basrah
11866	Clinic in Basrah–Hai Al Hussein	Basrah
19223	Police Station–Checkpoint–Fajr–D412	Thi-Qar
18248	Police Station–Al Qurnah–Police Station–B024	Basrah
12138	Border Post–Basrah #16–Kushk	Basrah
18268	Police Station–Al Faw–B033	Basrah
18223	Police Station–Abu-Al-Khasib–B032	Basrah
18273	Police Station–Safwan–B040	Basrah
20562	Border Post–As Sulaymaniyah #39–Awakurti	Sulaymaniyah

TABLE 3-4

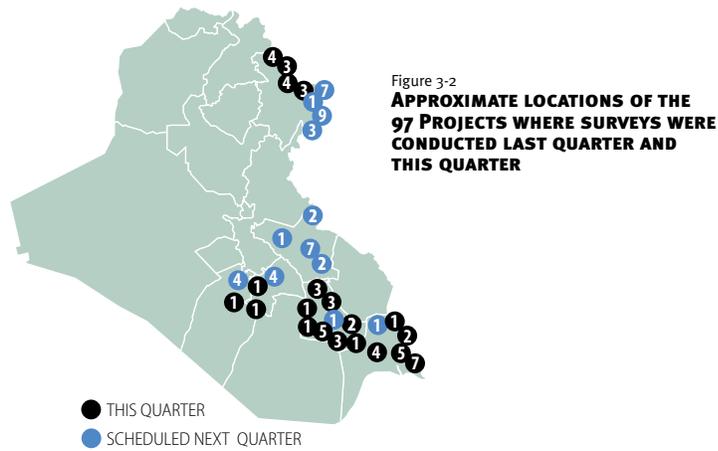
## PROJECT SURVEYED THIS QUARTER AND PROJECTS TO BE ANALYZED AND REPORTED NEXT QUARTER

PCO PROJECT NUMBER	PROJECT NAME	GOVERNORATE
12827	Border Post–Sulaymaniyah #16	Sulaymaniyah
12836	Border Post–Sulaymaniyah #19	Sulaymaniyah
20570	Border Post–Sulaymaniyah #40	Sulaymaniyah
20571	Border Post–Sulaymaniyah #49	Sulaymaniyah
12831	Border Post–Sulaymaniyah #17	Sulaymaniyah
20573	Border Post–Sulaymaniyah #62	Sulaymaniyah
12835	Border Post–Sulaymaniyah #18	Sulaymaniyah
20575	Border Post–Sulaymaniyah #41	Sulaymaniyah
18362	Police Station–Al Kut HQ	Wassit
21263	Thi-Qar Railway Station Rehabilitation (Nassriya)	Thi-Qar
19187	Police Station–Al Kut Traffic Police HQ	Wassit
19189	Police Station–Al Kut	Wassit
19181	Police Station–Checkpoint HQ Khanzarah	Wassit
19179	Police Station–Al Kut Emergency Swat	Wassit
12786	Border Post–Sulaymaniyah #06	Sulaymaniyah
20558	Border Post–Sulaymaniyah #48	Sulaymaniyah
12809	Border Post–Sulaymaniyah #32	Sulaymaniyah
12834	Border Post–Sulaymaniyah #34	Sulaymaniyah
12884	Border Post–Sulaymaniyah #26	Sulaymaniyah
19111	Police Station–Al Uropa W020	Wassit
19227	Police Station–Al Hayy HQ W015	Wassit
19779	Police Station–Qadisiyah HQ Q117	Qadissiya
20576	Border Post–Sulaymaniyah #54	Sulaymaniyah
12807	Border Post–Sulaymaniyah #12	Sulaymaniyah
20572	Border Post–Sulaymaniyah #59	Sulaymaniyah
20577	Border Post–Sulaymaniyah #61	Sulaymaniyah
16124	Najaf Teaching Hospital Phase I Parsons	Najaf
11913	Construct Clinic in Najaf–Al Uroba	Najaf
18334	Police Station–Jamhuri Q075	Qadissiya
20324	Police Station–Babail Special Missions Units Q128	Qadissiya
19117	Police Station–Attika Jail Q125	Qadissiya
19873	Najaf Teaching Hospital–GRS Portion Phase II	Najaf
10309	Maternity and Pediatric Hospital (Al-Najaf)	Najaf
12695	Border Post–Wassit #11	Wassit
19175	Police Station–Al Hayferiyah W005	Wassit

PCO PROJECT NUMBER	PROJECT NAME	GOVERNORATE
12826	Border Post–Wassit #06	Wassit
19230	Police Station–Bashier W047	Wassit
17789	Basrah Village Roads	Basrah
1861	Al Hasheme Substation	Wassit
12855	Border Post–Sulaymaniyah #23	Sulaymaniyah
12850	Border Post–Sulaymaniyah #22	Sulaymaniyah
20574	Border Post–Sulaymaniyah #43	Sulaymaniyah

TABLE 3-5

LIMITED ASSESSMENTS





Cut bank with no stabilization at border post

## Ground Project Surveys

SIGIR-PA-06-048

From September 3, 2005 to December 5, 2005, SIGIR conducted 55 limited on-site inspections. These limited on-site inspections focused on the Facilities and Transportation sector and included border control, education, medical and public safety facilities, roads, and railways. The overall objectives of the limited on-site inspections were to provide summary information on overall project progress and identify deviations from contract requirements.

SIGIR quality control and quality assessment teams performed the limited on-site inspections. The teams produced and forwarded a brief summary report to a SIGIR engineer/auditor team for review. The review of those reports, as well as contracting documents, provided the basis for the conclusions



Exterior wall of border post



Bathroom fixtures at border post

presented in our summary report, SIGIR-PA-06-048.

**Location coordinates.** SIGIR obtained coordinates for each project during the limited on-site inspections. SIGIR compared the project locations submitted by GRD-PCO against the actual location, as determined during the site visit. Of the 55 GRD-PCO submitted location sites:

- 31 were within 300 m of the actual site location.
- 9 were between 300 and 1,000 m.
- 2 were between 1 and 3 km.
- 13 were greater than 13 km from the actual location.

GRD-PCO officials acknowledged errors in their grid coordinate database.

**Border Posts.** SIGIR conducted ground project surveys of 22 border forts located along the Iraq-Iran border. Seventeen of the border forts were constructed through a single contract and five through another contract.

Contract requirements for 17 of the 22 border forts were to include an exterior compound wall with vehicle gate, four elevated guard posts, one watch tower, perimeter lighting, one operations building with three offices, secured arms room, communications room, toilet/shower room, kitchen/dining area, electrical generator, water storage, and septic system. At the time of the ground survey, 17 were complete or near complete and functional. However, only 7 of the 17 border forts had perim-

eter security systems, gates, berms, or walls installed. Concrete quality was sometimes poor, and inconsistent surfaces in concrete and plaster finishing were common in the buildings and other structures. Numerous sites lacked retaining walls to prevent degradation of the embankments created by site leveling.

Based on discussions with local personnel at the border forts at the time of the site visits, SIGIR found that the day-to-day users—the border police—were unaware of a plan for maintenance and logistical support for the border posts, and received little if any training in maintaining the generator and septic systems. Logistical needs, such as fuel and water delivery, were lacking at some border posts. The generators lacked protection from drifting snow, and some outdoor electrical fixtures lacked proper insulation against rainwater.

SIGIR requested copies of contract documents for the remaining five border forts included in our surveys; however, the MNSTC-I was unable to identify or locate the contract(s) for these projects. As a result, SIGIR was unable to determine the project objectives, SOW, or design specifications.

All five of these border forts were of poor quality construction and showed no signs of any recent maintenance. Although small generators were located at the five border forts, fuel storage was not available. Electrical and water systems were consistently either inoperable or needed repair. These projects will be further evaluated by SIGIR Inspections next quarter.

**Education Facilities.** SIGIR conducted limited on-site inspections at three school projects in the governorate of Thi-Qar. The primary focus of the projects was to repair or replace sanitary and storm sewer works, plumbing, electrical and mechanical systems, and the facility structure and security.

The quality of workmanship at the three schools assessed appears low. Materials used appeared to be substandard, although the contract required industrial-type equipment. Renovation was superficial in some areas, as demonstrated by painting interior and exterior walls without first repairing the walls. At the time of the ground survey, the schools were still in need of significant work.

**Medical Facilities.** SIGIR conducted limited on-site inspections of six medical facilities located in the governorates of Basrah, Qadis-

siya, Najaf, and Thi-Qar (two maternity and pediatric hospitals and four clinics). The overall objective of the maternity and pediatric hospital projects was to provide new, repair, or replace prioritized building systems and to provide new authorized equipment. The overall objective of the clinic projects was to provide for the design and construction of a standard model health care center with two variations: the first, a clinic with teaching facilities and the second, a clinic with emergency and labor facilities.



Broken tiles in school classroom



Concrete courtyard



Cracks in school's outer wall



Renovated hallway at one hospital project



Containerized reverse osmosis unit with storage tanks

At the time of the SIGIR site visits, renovations were ongoing at both hospitals. Based on a review of the project surveys, SIGIR noted no significant deficiencies. Minor deficiencies include poor interior finish, staining on the ceiling and floors (indicating water leakage, either from pipes or from the roof), floors requiring repair, and power cables inappropriately passing through a window into the electrical room at one of the hospitals.

New construction was in progress at all four of the PHCs where limited on-site inspections were conducted. Structural concrete beams, columns, and slabs were either complete or in progress at all the projects. Based on a review of the project surveys, SIGIR noted no significant deficiencies.

**Public Safety Facilities.** SIGIR conducted limited on-site inspections of 21 public safety projects (20 police stations/checkpoints and 1 fire station). The projects were or will be completed under various contracts awarded to Iraqi contractors. The overall objective for the police station projects was to renovate the existing facilities or construct new facilities. The overall objective for the fire station was to construct a fire station that would accommodate 20 firefighters and 11 daytime administrative staff members.

The SOW for 13 police stations required new construction or renovation of building(s) and/or facilities located on an existing/new site in Iraq. The construction included a masonry security wall around the compound, berms, vehicle and personnel gates, guard towers,



Exterior front of a primary health care clinic



Construction of columns and footers

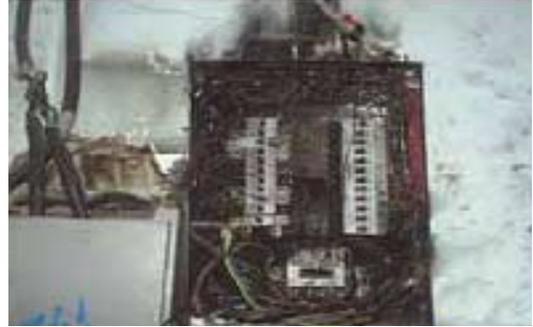
driveways and a parking area, sidewalks, plumbing, electrical and mechanical work, roof, ceiling, door, windows, walls, floors, and interior and exterior painting, as well as the purchase and installation of a diesel powered backup generator. SIGIR observed completed or ongoing renovation and/or new construction work at all the locations surveyed. Our assessment determined that the quality of electrical, plumbing, and finishing work at a majority of the projects surveyed was deficient.

The construction services work for seven police checkpoint projects included a checkpoint plot plan, checkpoint support station, covered parking stall for the commander, generator shed, sunshade islands and checkpoints, perimeter wall, break room, and checkpoint guard towers. SIGIR observed completed or ongoing renovation and/or new construction work at all the locations surveyed. In gen-

eral, the quality of construction of the police checkpoints was better than the police stations. However, our assessment did note deficiencies in the quality of electrical, plumbing, and finishing work at several of the police checkpoint facilities.

The SOW for the firehouse project included general building construction, structural, electrical, plumbing, heating and air conditioning, flooring, roofing, painting, administration and support areas, parking lots, pedestrian/vehicular circulation, and additional security to include perimeter controls, standoffs, and blast protection, as required.

The SIGIR team observed constructed structural concrete columns, beams, and elevated slabs on the ground, first, and second floor of the fire station. Several columns were wrapped with burlap, presumably for curing purposes. Review of photos showed no areas of



Electrical circuit breaker panel with burn mark



Police Station construction



Perimeter security wall with concertina wire and guard post



Deteriorating parapet around exterior roof drain



Exterior of checkpoint building



Exterior of road checkpoint



Fire station under construction

segregation, though SIGIR did not document the entire facility. Interior and exterior block walls were partially complete with external plastering in progress. Installation of window frames on the first floor rear of the building was ongoing. SIGIR noted no discrepancies.

**Transportation Projects.** SIGIR conducted limited on-site inspections of three transportation projects: two road construction projects in Basrah and Thi-Qar, and a railway station rehabilitation in Basrah.

The overall objective of the two road construction projects was to complete 19 km of paved rural village roads located throughout the governorate of Basrah and 7.1 km of paved rural village roads located throughout the governorate of Thi-Qar.

### What We Found

At the Basrah road project locations, the survey team verified road construction was in progress at the time of the visit. Installation of the sub-base and asphalt surface appeared to be consistent with the design requirements. Additional road surface and shoulder work was still required at the time of the visit. SIGIR did not note any major discrepancies. The Thi-Qar road project was reported to be 100% complete, but this could not be verified by the survey team. SIGIR observed recent road grading in the vicinity of the project; however, new asphalt was not in place. This project will be further evaluated by an in-depth SIGIR Inspections team during the next quarter.

The Basrah Railway Station renovation project was in progress at the time of the limited on-site inspection. Placement of exterior patio brick over sand base was



Asphalt surface of Basrah road project



Graded surface of Thi-Qar road project



Installation of brickwork



Manholes and excavation work

partially complete. The survey team observed brick and cement manholes and trenches between the manholes. Minor electrical work had also begun. SIGIR noted that manholes were of poor quality, wiring on the exterior of the building lacked conduit, and in some places wiring hung freely and passes through windows. Tiles were also missing from the hanging ceiling.

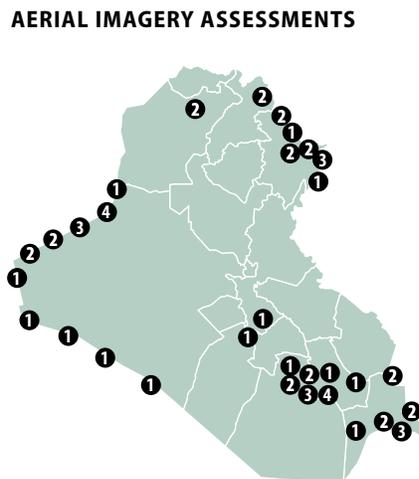
**Aerial Project Survey Program**

Based in Washington, D.C., the SIGIR Satellite Imagery Group conducts aerial assessments of U.S.-funded reconstruction project sites throughout Iraq. SIGIR project assessment

teams in Iraq use this information and analysis to evaluate project sites that are inaccessible because of the security situation or are located in remote locations. The teams also use this information to verify project locations and provide follow-up information on previously evaluated reconstruction sites. SIGIR shares this information with U.S. government contracting officials in Iraq. Figure 3-3 shows the approximate locations of aerial imagery assessments for the first quarter of 2006.

SIGIR has a continuing partnership with two other federal agencies that specialize in aerial satellite imagery analysis, the NGA and the NGIC.

Figure 3-3  
**APPROXIMATE LOCATIONS OF  
 AERIAL IMAGERY ASSESSMENTS  
 1ST QUARTER 2006**





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Images 1 and 2. Provided by NGA, the imagery shows progress of An Najaf Governorate road segment 2 between August 25, 2004 (left) and July 31, 2005 (right). The image on the left is before roadway construction, and the image on the right shows the completed asphalt road segment.



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Nextview License

Image 3. Example of imagery provided this quarter by NGIC helping to confirm locations of border forts in Iraq. Pictured above is a border fort in the southern region of Iraq near the Iraq-Iran border. A visual assessment of the imagery provided shows no visual indicators that the border fort does not meet contract specifications.



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Image 4. Example of imagery provided this quarter by NGIC. Pictured above is a completed border fort in the northern region of Iraq on the Iraq-Iran border. A visual assessment of the imagery shows no visual indicators that the border fort does not meet contract specifications.

This quarter, SIGIR asked NGA to provide imagery products of border forts and road construction projects throughout Iraq. NGA responded with imagery products and exploitation of 24 border forts and five segments of road construction projects to the SIGIR Satellite Imagery Group. An example of the imagery provided by NGA is shown in Images 1 and 2. The images are of the An Najaf Governorate road segment 2, pre- and post-construction.

NGA noted several issues conducting imagery searches for the road segments, particularly the difficulty of determining grid coordinates because the roads are not easily identifiable or distinguishable. Of the five road segments assessed, two were complete and the amount of paving appeared to meet contract provisions; two are in progress and the amount of paving should meet contract provisions when complete. One, road segment 3 in the Thi-Qar governorate, shows no signs of work started.

This quarter, NGA provided imagery analysis of 24 border forts along Iraq's border with Iran, Saudi Arabia, and Syria. The amount of construction at all but six appeared to meet the contract provisions, and three sites were located at significantly different locations than the grid coordinates provided (all were complete and the amount of construction appeared to meet contract provisions). Of the six projects

that were incomplete, one project is still underway. Three have one or more buildings outside of the perimeter wall/berm. One project does not have a perimeter wall/berm, and one project has only one observation tower; all other border forts have four towers.

SIGIR also requested this quarter that NGIC provide imagery products of border forts and various building projects located throughout Iraq. NGIC responded by providing 15 imagery products to the SIGIR Satellite Imagery Group for analysis and exploitation. Examples of imagery provided by NGIC are shown in Images 3 and 4.

#### **SIGIR SATELLITE IMAGERY GROUP ANALYSIS**

SIGIR also has its own imagery analysts, who use commercial satellite imagery libraries to gather imagery for analysis and exploitation and conduct comparison with other products contained in SIGIR Ground Survey reports.

This quarter, SIGIR satellite imagery analysts have produced 14 imagery products and written 11 project assessments. These project assessments were passed to the SIGIR Inspections group in Baghdad for further review and action/distribution. Notable findings for these assessments include:

- Six of the eleven sites assessed appeared to be in compliance with the contract provisions. (See imagery examples Images 5, 6, 7 and 8.)
- Two border fort sites did not have retaining walls, which would prevent soil erosion when it rains and protect against avalanches during the snowy winter season.
- One police station had a missing perimeter wall.
- Two police stations could not be fully assessed because contract files lacked sufficient information. There are no visual indicators to show that these project sites are not in compliance.
- Two police stations could not be differentiated because there was not sufficient information available.
- One border fort could not be identified because SIGIR Contractor Support reports provided incorrect geo-coordinates.

In both of these reports, SIGIR identified site contract nonconformities and limited contract information as significant issues, and has passed this information on to the responsible agencies.

In partnership with NGA and NGIC, SIGIR imagery analysts have completed 112 satellite imagery assessments to date; 58 assessments were completed this quarter. The SIGIR imagery section continues to help deployed SIGIR staff in Iraq to accomplish their challenging mission by providing them the best imagery available.

The remaining three imagery products obtained could not be analyzed.



Images 5 and 6. Comparison of imagery showing progress made at a public health clinic in southern Iraq between January 16, 2005 (left) and December 27, 2005 (right). The image on the left shows the initial ground preparation for construction. The image on the right shows the final leveling of soil around the clinic, which was noted as a deficiency in an earlier Ground Project Survey visit.



Images 7 and 8. Comparison of imagery showing progress made at another public health clinic in southern Iraq between March 22, 2005 (left) and November 11, 2005 (right). The imagery on the left shows the ground preparation before construction, and the image on the right shows the completed structure of the clinic. There were no visual indicators that the project was behind schedule or that it would not meet contract requirements.