

OFFICE OF THE SPECIAL INSPECTOR GENERAL FOR IRAQ RECONSTRUCTION

ERBIL POLICE ACADEMY
UNDER THE IRAQ SECURITY FORCES FUND
ERBIL, IRAQ

SIGIR PA-07-115
JANUARY 22, 2008



SPECIAL INSPECTOR GENERAL FOR IRAQ RECONSTRUCTION

January 22, 2008

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

SUBJECT: Report on Construction of the Erbil Police Academy, Erbil Iraq (Project Number
SIGIR PA-07-115)

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

We are providing this report for your information and use. It addresses the current status of the Erbil Police Academy in the Erbil governorate of Iraq. The assessment was made to determine whether funds were used effectively and efficiently.

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

We appreciate the courtesies extended to our staff. If you have any questions please contact Mr. Brian M. Flynn at brian.flynn@sigir.mil or at 914-360-0607. For public or congressional queries concerning this report, please contact SIGIR Congressional and Public Affairs at publicaffairs@sigir.mil or at 703-428-1100.

Stuart W. Bowen, Jr.
Inspector General

Special Inspector General for Iraq Reconstruction

SIGIR PA-07-115

January 22, 2008

Erbil Police Academy Under the Iraq Security Forces Fund Erbil, Iraq

Synopsis

Introduction. This project assessment was initiated as part of our continuing assessments of Security and Justice reconstruction/construction activities. The objective of the project was to determine whether Iraq Security Forces Fund funding for a not yet completed project has been effectively and efficiently used thus far. This project assessment was conducted in accordance with the Quality Standards for Inspections issued by the President's Council on Integrity and Efficiency.

Project Objectives. The objective of the project was to design and construct a police training academy to accommodate 650 students. When the Erbil Police Academy project was planned, none of the 4,300 Erbil province police officers had attended a training course approved by the Civilian Police Assistance Training Team. When completed, the Erbil Police Academy should substantially contribute to achieving the Iraqi national goal of 135,000 properly trained police officers.

Assessment Objectives. The objective of this assessment was to provide real-time information about relief and reconstruction projects to interested parties to enable appropriate action, when warranted. Specifically, SIGIR determined whether:

1. Construction and sustainability planning were adequate;
2. Contract execution and construction management practices have been adequate; and
3. Asset transfer to the Government of Iraq will likely be completed in a timely manner.

Conclusions. The assessment determined that:

1. Planning for construction and sustainment was adequate because applicable policy and procedures were implemented. The Scope of Work was detailed, understandable, and could be used as a management tool, ensuring that the contractor and United States Army Corps of Engineers personnel had the same point of reference. This lessened the risk of confusion about requirements.

The Scope of Work included clear descriptions of material requirements and construction specifications. Planning also included an effective partnership with the Kurdistan Regional Government, starting in the preliminary planning stage of the project. Also, Kurdistan Regional Government officials were included in determining project needs. As a result, the design-build process was effectively managed with timely contractor submittals and United States Army Corps of Engineers approval.

2. Contract execution and construction management practices have been adequate because an effective quality management process was implemented. In addition, the United States Army Corps of Engineers Resident Engineer initiated a formal in-house quality management training program to ensure that all parties are briefed and trained in the expectations and processes required by the contract to effectively monitor and control construction activity in real time.

Special Inspector General for Iraq Reconstruction inspectors observed that contractor quality control and government quality assurance personnel had satisfactory administrative office space, which aided in contract execution and construction. Concrete-forming techniques ensured even horizontal and vertical edges. Lean concrete pours were proper. Steel reinforcement bars were properly sized and placed. Poured concrete columns, beams, and walls showed no separation of materials, which attests to the fact that the concrete was poured properly. Also, required testing (materials, soil, poured concrete, etc.) has been completed without any rejections to date.

3. Acceptance of the project by Kurdistan Regional government officials should be accomplished in a timely manner primarily due to the innovative approach of including Kurdistan Regional Government ministry level officials in the initial planning of the project. Based on discussions conducted with ministry officials, ownership of the project was “assumed” from project beginning. The Kurdistan Regional Government has partnered with the United States government. Specifically, the United States government has contracted to build selected elements of the overall project valued at approximately \$10 million while the Kurdistan Regional Government has selected other parts of the overall project valued at approximately \$5.4 million.

Recommendations and Management Comments. This report does not contain any negative findings or recommendations for corrective action; therefore, management comments were not required. When the fieldwork was completed, the results of this assessment were discussed in detail with the Resident Engineer, United States Army Corps of Engineers Erbil Resident Office and briefed to the Area Engineer, United States Army Corps of Engineers Mosul Area Office. Multi-National Security Transition Command-Iraq and Gulf Region Division officials reviewed this report, had no comments, and offered no additional information.

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Introduction

Objective of the Project Assessment

The objective of this project assessment was to provide real-time relief and reconstruction project information to interested parties to enable appropriate action, when warranted. Specifically, Special Inspector General for Iraq Reconstruction (SIGIR) inspectors determined whether:

1. Construction and sustainability planning were adequate;
2. Contract execution and construction management practices have been adequate; and
3. Asset transfer to the Government of Iraq will likely be completed in a timely manner.

Pre-Site Assessment Background

Project Objective

The “Intent of Work” paragraph included in the Scope of Work Section I required the contractor to provide “*all design and construction requirements for the new Erbil Police Academy*” to service no less than 650 users. When completed, the Erbil Police Academy should contribute towards achieving the Iraqi national goal of 135,000 properly trained police officers. At the time the project was planned none of the 4,300 Erbil Province police officers had attended a Civilian Police Assistance Training Team (CPATT) approved training course. The contract required the contractor to provide engineering, design, and facility construction to meet operational needs of the police academy, taking into account existing topography, structures, underground utilities, and present electrical panel loads. The contractor was responsible for developing, obtaining, and incorporating any specific criteria included in the Scope of Work into their design package. In addition, the contractor’s design was subject to review by the United States Army Corps of Engineers (USACE) Resident Engineer (RE) and changes required by the USACE would be incorporated into the design before construction.

In accordance with the Scope of Work, all planning, design, and construction requirements covered the following critical aspects:

- site preparation
- water system
- wastewater systems
- electrical power supply and distribution
- control point building and boundary walls
- restaurant building
- education building
- management building
- dormitory building
- health building
- sport building
- cafeteria building

- shot area
- sport area
- ceremony yard
- drive, walk ways, retaining walls and additional external works

Contract, Cost and Payments

Based on a review of information provided by the RE¹, the contract for the Erbil Police Academy project was awarded and administered by the U.S. Army Corps of Engineers (USACE) Gulf Region Division (GRD) – Northern District (GRN) under contract W917BE-07-C-0043, dated 19 June 2007. The contract was a firm-fixed price (FFP) design and construct contract with a period of performance to end 365 days following the official issuance of the Notice to Proceed (NTP) at the pre-construction conference. Accordingly, the forecasted completion date for the project is 29 June 2008. Contract W917BE-07-C-0043 was awarded to Tigris Muh Musavirlik Eletrik (Tigris Company), a Turkish company, in the approximate amount of \$10 million.

In response to the U.S. government's (USG) competitive solicitation dated 22 February 2007, contractors submitted priced Bills of Quantities (BOQ) which were evaluated by the USACE technical review board² and used as the basis for selecting BOQ elements to be included in contract W917BE-07-C-0043. Following the technical review of respondent proposals, source selection was based on price and non-price criteria to include capacity to perform, performance history, and the management plan. Although the BOQ resulted in Contract Line Item Numbers (CLIN) 0001 through 0021 totaling approximately \$21.2 million, the USG prioritized and exercised ten CLINs in the approximate amount of \$10 million (Table 1). As part of a cost sharing arrangement between the USG and the Kurdistan Regional government (KRG), seven CLINs valued at approximately \$5.4 million (Table 2) were prioritized and exercised by KRG. As a result, four optional CLINs included in the contractor's BOQ and priced at approximately \$5.7 million (Table 3) were not selected or included in initial contract actions by USG or KRG. While the CLINs selected by USG and KRG will meet basic requirements for the new academy, any of the unexercised options could be exercised for up to two years by either the USG or KRG. All CLINs considered basic or mandatory were included in the USG's contract.

While KRG activities are beyond the scope of this project assessment, a brief description of the cost sharing arrangement between the USG and the KRG will help understand key planning aspects of contracting action that preceded construction. Bona-fide cost sharing resulted from USG and KRG each performing specific and independent work elements disclosed in the contractor's Scope of Work. For example, the USG was responsible for the complete construction of the education building priced at approximately \$2.4 million (Table 1) while the KRG was independently responsible for the management building priced at approximately \$1.6 million (Table 2).

The RE explained that planning discussions had been conducted with KRG officials for almost a year before construction started on the new Erbil Police Academy. As a result, KRG officials independently chose to use the services of the same contractor that was selected by USACE. Accordingly, KRG entered into a contract with Tigris Company to complete the BOQ elements shown in Table 2.

¹ The USACE RE was officially designated and acted as the Contracting Officer's Representative (COR).

² The board was augmented by GRN contract and legal staff acting in an advisory capacity. In addition, the board included one non-voting member provided by KRG.

KRG modeled its contract on the USACE contract in order for USG and KRG to hold the contractor to the same standards, general requirements, and schedule. The RE stated that overall the cost sharing arrangement was beneficial because issues or problems generally associated with having multiple contractors on site have been avoided. For example, material requirements, design submittals and approvals, quality control requirements, and construction techniques are consistent whether applicable to the USG or KRG work.

CLIN #	BOQ Elements Exercised by USG	Amount
0001 (Base)	Design Drawings	\$200,000
0001AA (Base)	Mobilization	\$250,000
0002 (Base)	Site Preparation	\$150,000
0003 (Base)	Design and Build Sewerage System	\$144,000
0004 (Base)	Steel Water tank and Two Deep Water Wells	\$201,163
0005 (Base)	Design and Provide Electrical Power Supply	\$717,948
0006 (Base)	External Electrical Works	\$162,887
0008 (Optional)	Design and Build Restaurant Building	\$2,129,209
0009 (Optional)	Design and Build Education Building	\$2,414,336
0011 (Optional)	Design and Build Dormitory Building	\$3,612,759
0021	DBA Insurance	\$24,077
	USG Total Share	\$10,006,379

Table 1

CLIN #	BOQ Elements Exercised by KRG	Amount
0007 (Optional)	Control Point Building	\$641,346
0010 (Optional)	D/B Management Building	\$1,632,147
0016 (Optional)	D/B Sport Area	\$400,000
0017 (Optional)	D/B Ceremony Yard with Viewing Stands	\$400,000
0018 (Optional)	Drives, Walk Ways, Retaining Walls	\$1,766,024
0019 (Optional)	External Works (Drainage System)	\$180,000
0020 (Optional)	Passenger and Car Bridge	\$420,000
	KRG Total Share	\$5,439,517

Table 2

CLIN #	BOQ Elements Not Exercised	Amount
0012 (Optional)	D/B Health Building	\$3,612,759
0013 (Optional)	D/B Sport Building	\$1,037,344
0014 (Optional)	D/B Cafeteria Building	\$388,249
0015 (Optional)	D/B Shot Area	\$701,721
	Total	\$5,740,073

Table 3

Figure 1 graphically shows the layout of the facility and split of shared responsibility assumed by the USA and KRG. USA responsibility is designated by the red shaded areas. KRD responsibility is designated by the green shaded areas.

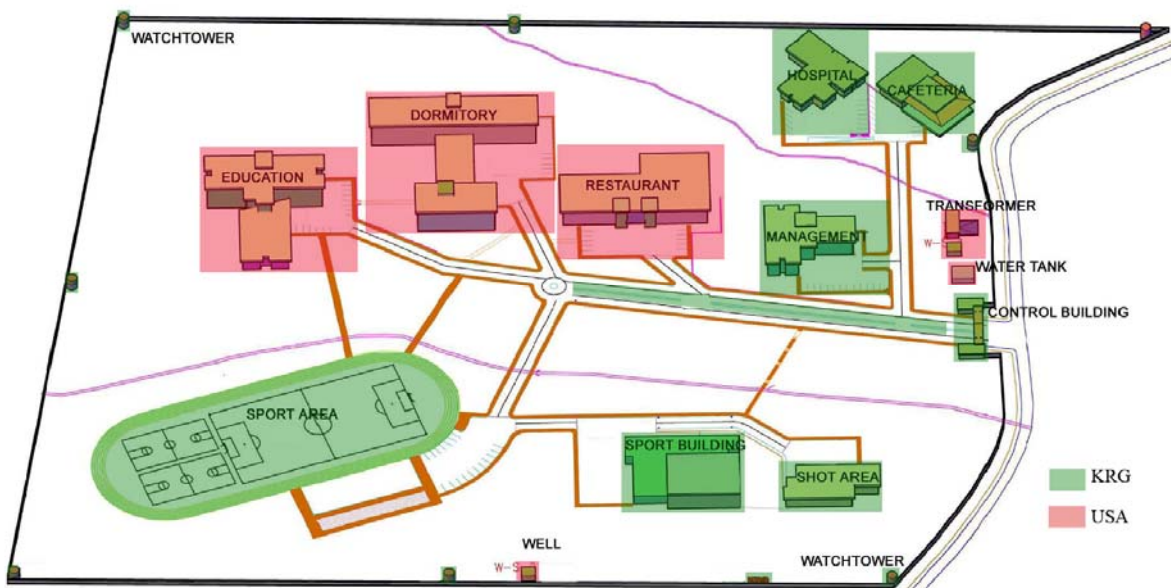


Figure 1. Layout of the facility. Red shaded areas designate USA responsibilities. Green shaded areas designate KRG responsibilities.

Scope of Work

Project construction and sustainability planning, subsequent contract execution, and construction management were joined together by the Scope of Work which is comprised of five key sections:

- Section I Summary of Work
- Section II Contractor Requirements
- Section III General Requirement
- Section IV Technical Requirements
- Section V Bid Schedule

Based on a detailed review of each of the five sections, the Scope of Work was sufficiently detailed and complete to reasonably ensure a functional facility will be constructed. The Scope of Work was reasonably flexible and likely facilitated effective contractor design/build submittal and USG approval processes. In addition, Scope of Work language was clear and easily understood.

The Deputy RE, an Iraqi national, stated that all government and contractor engineers associated with design and building aspects of the project were able to read English, even if they were not able to speak English fluently. The SIGIR inspector did not have any difficulty communicating with KRG and contractor engineers while on site.

Quality Management

Scope of Work, Section II included requirements for the establishment of a quality management (QM) program, where quality construction would be the combined responsibility of the construction contractor and the government. Based on applicable regulation, their mutual goal was a quality product conforming to the contract

requirements. A review of contractor quality control (QC) and USG's quality assurance (QA) daily reports from August through mid-November 2007, and discussions conducted with the RE, Deputy RE, USACE quality assurance representative (QAR) and the contractor's QC engineer, disclosed that the contractor's QC and the government's QA programs were effective. As a combined function, QM has been effective.

QC/QA reports were sufficiently complete, detailed and included pictures to document project progress and key construction activities. The reports documented that tests of materials and specific construction tasks have been completed. Site Photo 1 shows samples of reinforcement steel bar (rebar) that was laboratory tested to verify that strength requirements were met. Site Photo 2 shows a concrete sample taken 14 November 2007 that will be subjected to laboratory testing to verify whether the concrete meets the 3,000 pounds per square inch strength requirement. The RE stated that all concrete tests taken thus far in the project have been acceptable.

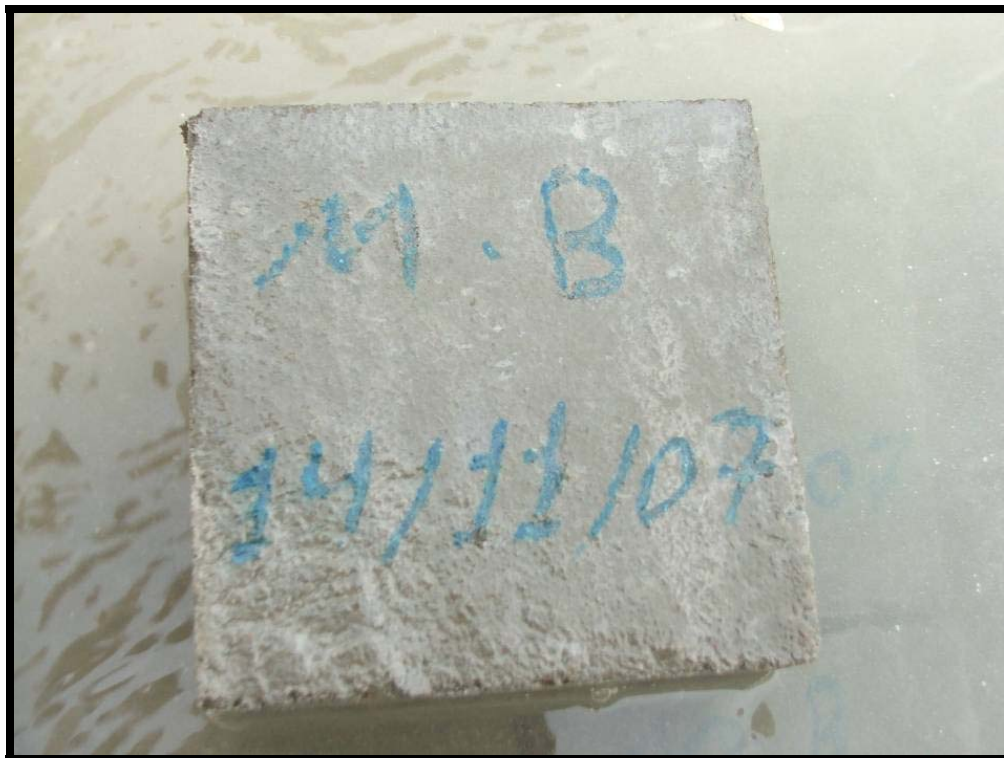
In addition, SIGIR reviewed selected test results and found that concrete strength requirements were met. The RE stated that acceptable mixed concrete was readily available locally. The contractor's 18 November 2007 QC report included Site Photo 3 showing that electronic equipment was used to verify whether soil was sufficiently compacted prior to construction. The 18 November 2007 QC report included a short, but sufficient, narrative about compacting soil work performed for the dormitory building. Site Photo 4 included in QA report dated 18 October 2007 shows a number of things descriptive of the project in general. For example, the size of the education building and the extent of site excavation work can be visualized. The photo documents the proper use of forming materials specified in the Scope of Work and proper placement of rebar over a sub-grade footing in the basement floor to adequately support load bearing walls that are yet to be constructed.

A review of the pre-construction conference documentation confirmed that QC/QA personnel participated in the mandatory pre-construction conference. Also, the RE initiated a formal in-house QM and Safety Management Program for contractor and selected USACE personnel. The 30-hour program was taught over a 10-day period by properly trained USACE personnel and based on USACE training materials and curriculum. The course was participative in nature and taught/facilitated by a locally hired Phd-level engineer fluent in English, Kurdish, and Arabic. The course facilitator explained that the course included reading assignments, PowerPoint presentations and lecture, and classroom discussions.

Students were required to take a pre-test and final test to measure the immediate effectiveness of the training. The training course culminated with the issuance of completion certificates endorsed by the Chief, USACE Professional Development Support Center. SIGIR's review of documentation disclosed that scores improved significantly between the pre and final tests. In general, pre-test scores improved by 10 points on the final exam. The course facilitator stated: "...it is not that contractor personnel are unwilling to comply with USACE QC requirements, they are unfamiliar with USACE ways..." Implementation of the in-house QM and Safety Management Program training course was a practical way to address head-on any issues that the participants were unfamiliar with and very likely will serve as a catalyst for improved QM.



Site Photo 1. Rebar varied between .375" and .675" diameter depending on application.



Site Photo 2. Concrete test cubes were marked to ensure test and sample integrity.



Site Photo 3. The contractor used modern equipment to perform compaction tests during the process fill and compact in layers. (Contractor provided photo)



Site Photo 4. In single-story pad foundations, horizontal rebar assemblies designed to increase foundation strength were placed below the location of planned load bearing walls. (Photo courtesy of USACE)

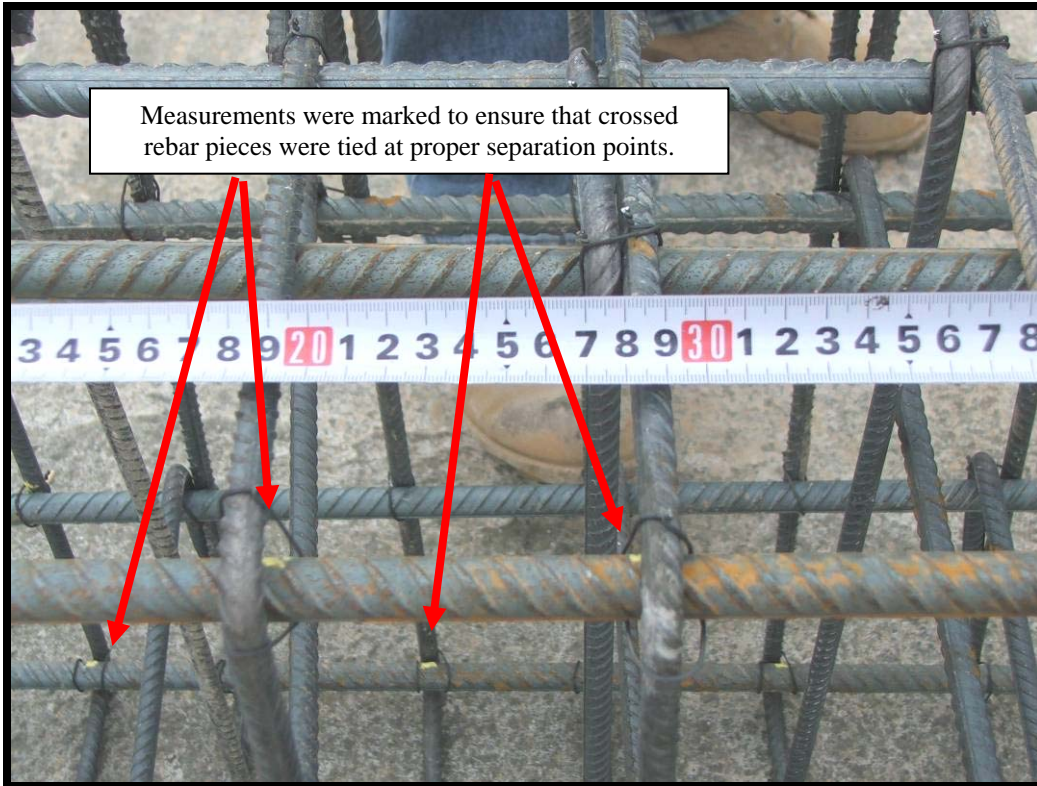
SIGIR observed that work crews were organized along task lines and supervised by lead or foremen-level personnel. This method of work organization is efficient and effective because many tasks that are a subset of the whole are repetitive in a project as large and complex as the Erbil Police Academy. As a result, workers quickly become proficient and familiar with their assigned task requirements.

In addition, SIGIR observed that the contractor set up a designated work area to prefabricate raw stock rebar into subassemblies for follow-on use throughout the project. Rebar subassemblies were then used wherever needed on the construction site.

Site Photo 5 shows workers using a bench with cutting and bending equipment to measure, cut, and bend raw rebar stock for subassemblies. Site Photo 6 shows a prefabricated rebar subassembly built in accordance with design requirements. This process to use a designated work area to prefabricate rebar subassemblies should contribute to overall project quality.



Site Photo 5. Workers used a bench with good equipment to measure, cut and bend rebar assembly sub-components used throughout the project.



Site Photo 6. Rebar was pre-measured and marked to facilitate correct placement of rebar assembly components.

Sustainability

The design/build contract did not include requirements for post construction operations and maintenance (O&M) support. However, sustainability in terms of long-term usefulness and utility was adequately addressed in the contract. A number of conscious “risk averse” decisions were made during initial planning to enhance the likelihood of long-term usefulness and sustainability of the facility.

The RE stated that certain brands or styles of equipment were specified or cited as a benchmark based on known quality and local availability of parts and service technicians. Scope of Work, Section III stated:

“All equipment furnished under this contract, regardless of country of manufacture or purchase, must have in-country service availability. In the event that the Contractor proposed to provide equipment for which in-country service is not available, the Contractor must provide written justification for the USACE Resident/Project Engineer’s approval. This justification shall be submitted for each product or material for which a waiver is sought concurrently with the submittal required by the technical provisions. Submission of group or “blanket” waivers is unacceptable.”

For example, the Scope of Work specified that Volvo or Perkins brand generators would be supplied, installed, and tested.

In addition, the Scope of Work requirement for an automatic transfer switch system to connect the facility to the commercial power grid will also protect the generators from

any grid surges. In another case, the Scope of Work required that split-unit heating and cooling systems would be used throughout the facility. The RE stated that the split-unit concept was preferred over a boiler and chiller system, because parts and service were readily available.

An elevated water tank with a centralized water distribution system will be constructed on the campus' high point. Often in Iraq, numerous small water tanks are mounted on roof tops and separate pumps are used to fill the tanks and distribute the water within the building. However, such systems require considerable maintenance according to the RE. Planners opted for a water tower/tank system that will have "fewer moving parts" and less complex water distribution plumbing which should lessen post construction maintenance while maximizing system performance (line pressure and volume).

The contractor was required to provide USACE approved final As-Built drawings showing all deviations, changes and modifications, however minor, as a record of all construction work completed. Additionally, the Scope of Work specified the following documentation be provided: Five copies of all manufacture O&M manuals written in English and Arabic, O&M Records of Training, Spare Parts List, Electrical Distribution Plan, Water Distribution Plan, and Lighting Distribution Plan.

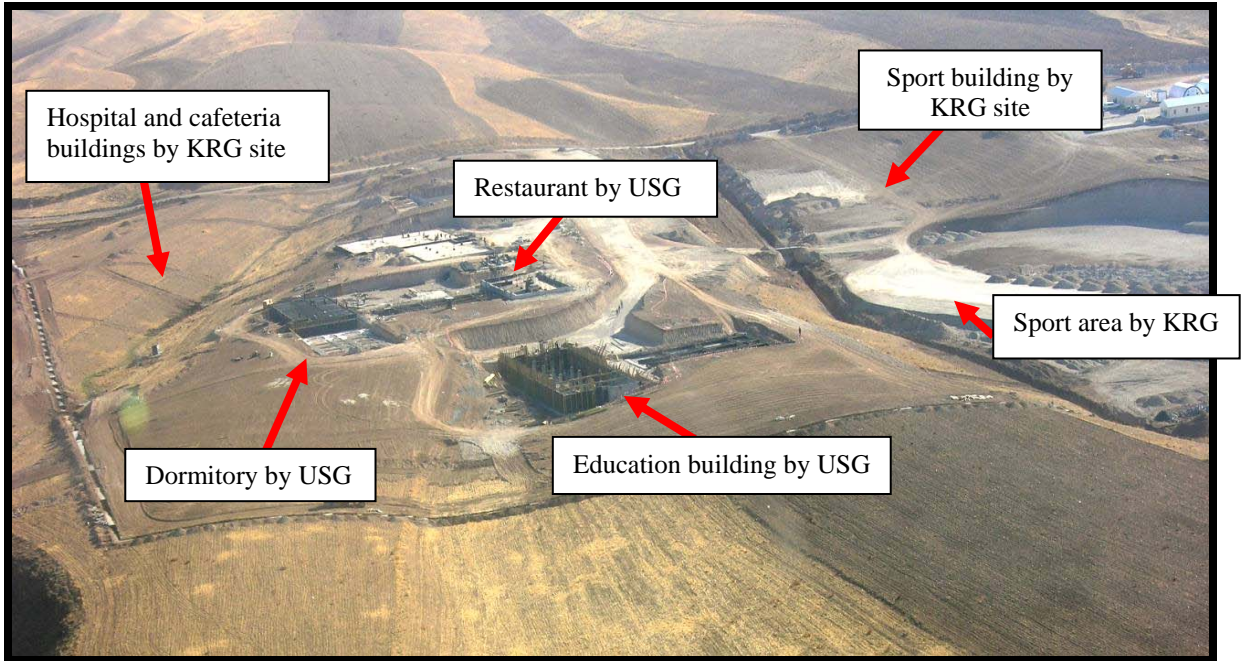
Lastly, the Scope of Work included provisions for normal warranties and reasonably explicit instructions to the contractor. The contractor was required to maintain an effective warranty program which provided corrective action for any construction defects for 12 months following occupancy by the end user. The contractor was required to provide the end user feedback prior to closing out a warranty issue. The Scope of Work stated, "...warranties shall be provided and certified in the name of the appropriate Ministry for all material or equipment, which includes any mechanical, electrical and/or electrical devices. The contractor will further provide any commonly offered extended warranties for material, equipment and machinery purchased to the appropriate Ministry official." In addition, a warranty plan approved by the USACE RE was a required submittal before construction started.

Site Assessment

Site Preparation (pre-construction)

The site is approximately 36 acres and on rough ground located approximately 15 miles northeast of the Erbil city center. Site Photo 7 shows the facility as it was on 18 November 2007. Considerable excavation (cutting and fill) work was required to prepare the site for building. According to the site plan, no building structures have been or will be placed on filled areas. Soils cut from the hill top have been placed in low ground locations to lessen the overall grade differences and improve the general usefulness and appearance of the campus grounds. The sport area/athletic field will be built on compact fill.

Site Photo 8 shows a portion of the extensive excavation work required to properly prepare the site for constructing the Education building. Excess soils were stockpiled on site for subsequent screening and use as backfill. Bore hole tests throughout the facility and laboratory analysis confirmed that all buildings would be placed on suitable locations where soil bearing capacity was sufficient. The geotechnical investigation report summarized that foundations per design "will not settle excessively and settlement that may occur will be within the tolerable limits".



Site Photo 7. Fly-over picture taken a few days before site visit. (Photo courtesy of USACE)



Site Photo 8. Pre-construction site preparation and excavation was extensive. (Photo courtesy of USACE)

Work Completed

Selected technical requirements included in the Scope of Work, Section IV were selected by the SIGIR inspector for observation during the site visit in order to verify whether observed conditions met contract requirements.

Based on discussions with the RE and SIGIR's review of selected design submittals before the site visit, contractor submittals have been timely and approved by the RE before construction started. No standalone subcomponents of the project or CLIN were 100% complete at the time of the site visit. However, USACE estimated the overall project to be approximately 24% complete as of 24 November 2007³. The completed man camp is shown in Site Photo 9. The rigid framed reinforced fabric covered huts, warehouse, and construction offices were placed on concrete pads elevated approximately 18 inches above grade. As such, the man camp should remain dry during the rainy season. Site Photo 10 shows one of two deep water wells. The Deputy RE stated that project planners included a requirement in the Scope of Work for two deep⁴ wells to increase the amount of potable water. Both wells ended up being ample volume free flowing artisan wells with water that tested completely potable.

SIGIR reviewed files which support processes that were used to approve contractor progress payments and the reported percentage complete. Based on SIGIR's review the reported percent complete was reasonably accurate. The contract requires the contractor to submit a monthly invoice summarizing the percentage complete by subproject. Additionally, contract terms call for a 10% withhold from all payments in lieu of bonding requirements. As of 7 November 2007, the USG paid the contractor approximately \$1.5 million in three invoices approved by the RE. A fourth invoice was expected in mid-December to better align project progress with payments to the contractor.



**Site Photo 9. Man camp was well organized with good facilities.
(Photo courtesy of USACE)**

³ Based on Iraq Reconstruction Management System (IRMS) as of 7 Dec. 2007.

⁴ The SOW required wells to be 300 meters or approximately 985 feet deep.



Site Photo 10. Ample clean water free flowed from both deep wells drilled on site.

Work in Progress

SIGIR conducted a site visit on 21 November 2007. While on site, SIGIR discussed various aspects of the project with the contractor's project engineer, the USACE on-site engineer, and the RE and Deputy RE. Over 75 photos were taken to document our observations of the work in progress.

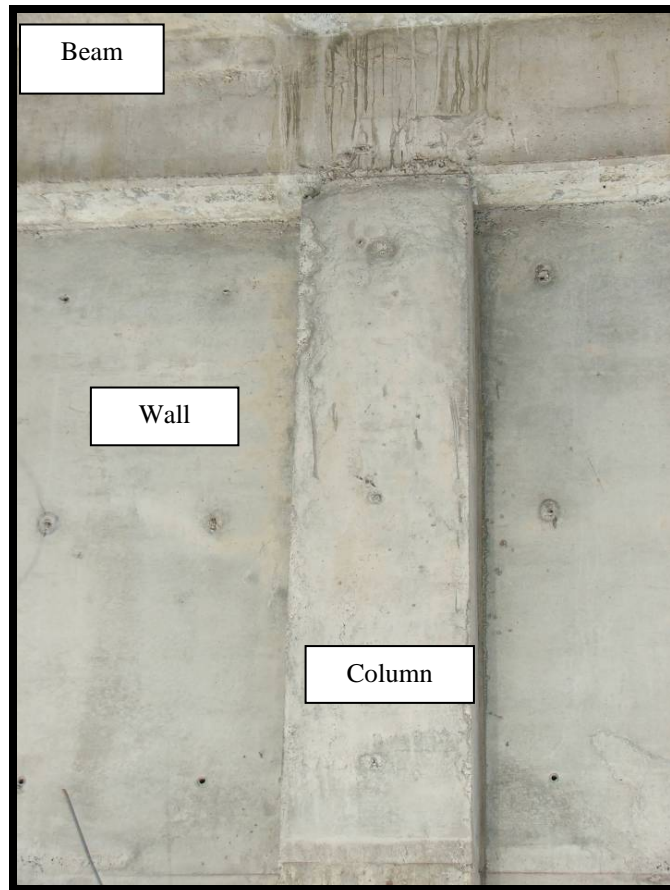
All three buildings⁵, representing approximately 82% of the total cost of the USG's share of the project, were under construction at the time of the site visit (Table 1). The RE stated that all design submittals for work observed were approved before construction started and the contractor has skilled personnel providing in-house architecture and construction design services. As a result, some submittals that were not approved initially had been reworked by the contractor and subsequently approved in a timely manner. As of 21 November 2007 no change submittals were required. Observing the project at an early stage provided an opportunity to determine whether adequate planning and construction management practices will likely result in a satisfactory project or whether changes should be made to improve the likelihood of a satisfactory project when completed. In the case at hand, all work in progress appeared to meet the Scope of Work requirements.

All concrete columns, beams, walls, and floors observed appeared to have been properly constructed and in accordance with design plans. There was no separation of materials (honeycombing). All horizontal and vertical edges observed were straight, and the thickness of poured concrete walls was uniform. It appears that the Scope of Work requirements to use certain forming materials⁶ was a critical planning element that facilitated the high quality construction observed by SIGIR.

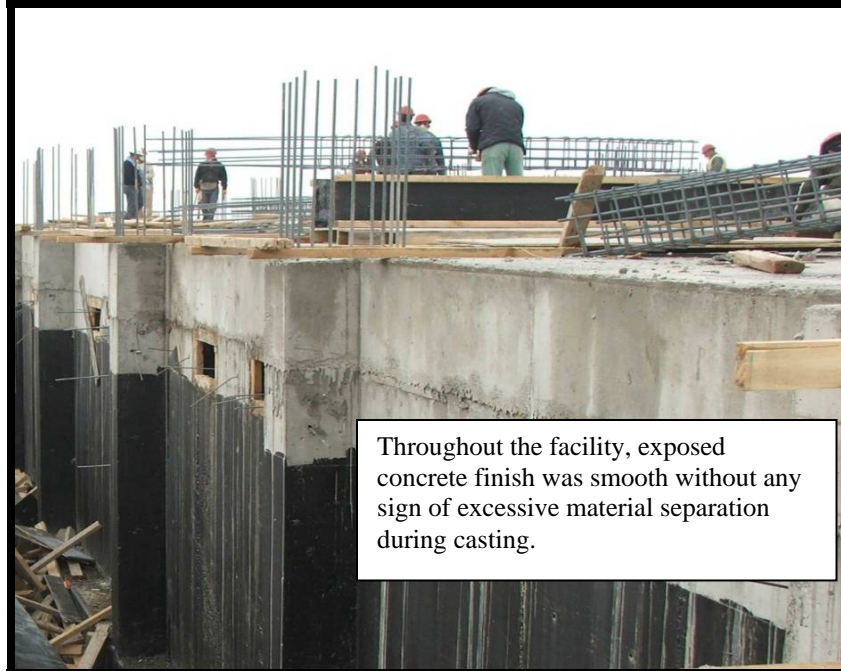
⁵ CLIN 0008 - Restaurant Building \$2.1 million, CLIN 0009 – Education Building \$2.4 million, and CLIN 0011 Dormitory Building \$3.6 million.

⁶ The Technical Requirements section of the SOW specified that Peri formwork materials.

Site Photo 11 was taken from inside the basement of the Education building and Site Photo 12 was taken from the outside of the Dormitory building. Both photos document that the concrete was properly placed.

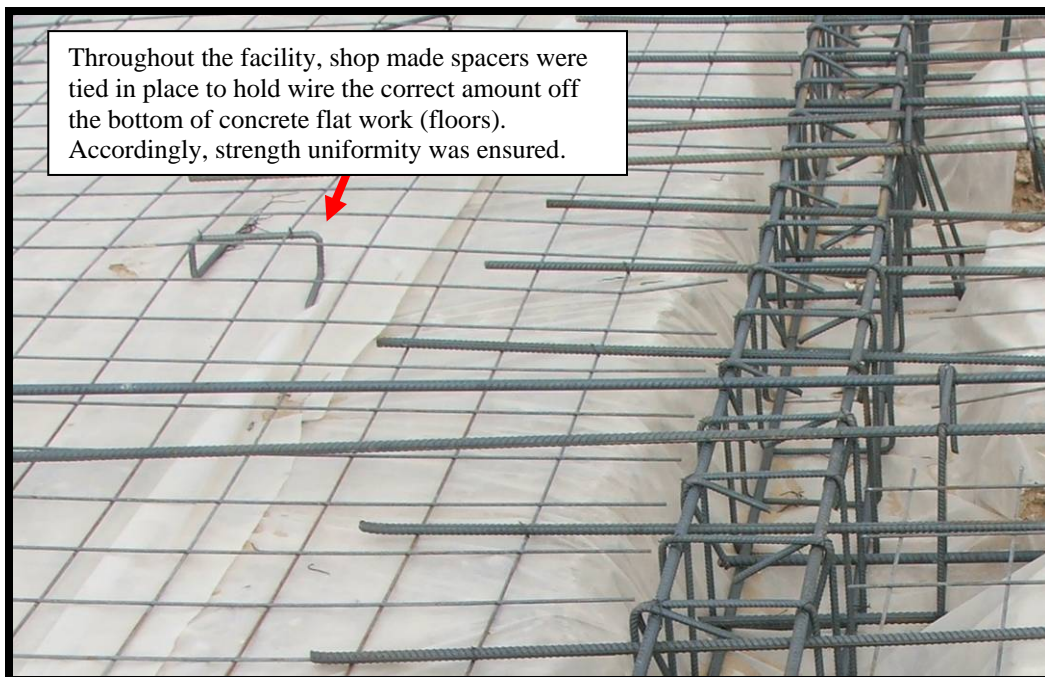


Site Photo 11. Throughout site, structural concrete showed no sign of honeycombing.



Site Photo 12. Per the Scope of Work, below grade concrete was water proofed.

Site Photo 13 taken in the restaurant building shows where rebar has been placed in a shallow footing of the pad foundation to provide adequate support for a load bearing wall, yet to be constructed. Unlike the basement floor of the Education building, the restaurant is not a multi-story building above a basement; therefore, the size of the footing and amount of rebar needed to comply with design requirements is significantly less.



Site Photo 13. Extra rebar was placed to support future wall construction.

Site Photos 14 and 15 document the contractor use of Peri formwork materials as required. A Peri solid girder is shown in Site Photo 14 and a portion of a sheet of Peri plywood is shown in Site Photo 15. The black resin coating on the plywood ensures a smooth concrete finish because the form will not bond with the concrete. The Peri girder is manufactured to uniform specifications in terms of load capability and dimension. As such, workmen can be assured that the girders will be strong enough when properly placed to ensure a flat concrete floor/ceiling when used in combination with Peri plywood specifically designed for formwork applications. The contractor's on-site engineer stated that workers liked to use Peri formwork materials compared to non-uniform materials because their uniformity made it easier to build proper forms.



Site Photo 14. Per Scope of Work, a manufactured form girder system was used.



Site Photo 15. Contractor used premium forming materials.

Site Photos 16 and 17 are of the dormitory basement. In Site Photo 16, an advantage of a system of uniform forming materials is demonstrated. Specifically, a Peri girder securely lies horizontally flat and vertically upright atop the steel post that can be locked at the required height. Because this portion of the work was still in progress, short section beams and plywood were not yet properly placed.

As previously stated, all horizontal and vertical edges observed were straight and the thickness of poured concrete walls was uniform. Contrary to formwork methods that rely on non-uniform materials, substantial nailing or spacers with tie wires, the contractor used a system of locks to ensure that column and vertical walls were uniform. Site Photo 17 shows a close-up of such a lock. As concrete fills a form, the form is retained in proper position by a lock on either side of the form. Prior to pouring concrete, workers simply measure the correct dimension of the form, places a piece of rebar through the form, and lock the desired position.



Site Photo 16. Throughout facility, form work was excellent.



Site Photo 17. Locks effectively controlled form movement during casting.

The RE stated that a concrete pump with an extension boom had been used to place concrete throughout the project. Such equipment facilitates placing concrete in a continuous manner resulting in normal and uniform shrinkage during the cure process. In

addition, this practice to place concrete avoids dropping the concrete too far and minimizes separation of the concrete mix materials (water, rock and cement). When properly vibrated during the casting process honeycombing is also avoided. As a result, uniform concrete strength is ensured. In additions to being faster than using more labor intensive methods (wheel barrows or buckets) to place concrete, worker safety and form maintenance is improved because the extension boom can reach any part of the project from a correctly positioned pump. The RE stated that the contractor used the services of fully capable ready-mix concrete suppliers and had backup pump equipment. Site Photo 18 shows the reach of the pump's extension boom.



**Site Photo 18. Concrete pump extension boom used to place concrete was handled by one man.
(Photo provided by USACE)**

The Scope of Work required the contractor to supply materials and cast lean concrete (class C16⁷) under foundations. The lean concrete was required to be 10 centimeters or approximately 3.9 inches thick and placed to meet the required elevations of the structural foundation. As shown in Site Photo 19, the lean concrete was poured to meet required thickness.

⁷ Approximately 2,320 pounds per square inch compression strength.



Site Photo 19. Blind (lean non-structural) concrete was sufficiently thick throughout facility.

Work Pending

At the time of our site visit, about 24% of the project was completed. The above ground construction of the education, dormitory and restaurant buildings was pending. In addition, utility systems (electricity, sewer, and potable water) were pending with the exception of the completed deep wells previously described in this report. Based on the detailed pre-construction planning and the on-going construction management, both conducted in partnership with the Kurdistan Regional government, the likelihood of a successful project is improved. Based on SIGIR's discussions with the contractor's on-site engineer, KRG officials, and the RE and Deputy RE the up-coming work should be executed and monitored as effectively as work completed to date.

Conclusions

SIGIR reached the following conclusions for assessment objectives 1, 2, and 3. Appendix A provides details pertaining to Scope and Methodology and the limitations of this project assessment.

1. Determine whether construction and sustainability planning were adequate.

Planning for construction and sustainment was adequate because applicable policy and procedures were implemented. The Scope of Work was detailed, understandable, and could be used as a management tool, ensuring that the contractor and USACE personnel had the same point of reference. This lessened the risk of confusion about requirements. The Scope of Work included clear descriptions of material requirements and construction specifications. Planning

also included an effective partnership with the Kurdistan Regional Government (KRG), starting in the preliminary planning stage of the project. Also, KRG officials were included in determining project needs. As a result, the design-build process was effectively managed with timely contractor submittals and USACE approval.

2. Determine whether contract execution and construction management practices have been adequate.

Contract execution and construction management practices have been adequate because an effective quality management (QM) process was implemented. In addition, the USACE Resident Engineer initiated a formal in-house QM training program to ensure that all parties are briefed and trained in the expectations and processes required by the contract to effectively monitor and control construction activity in real time. SIGIR observed that contractor QC and government QA personnel had satisfactory administrative office space, which aided in contract execution and construction. Concrete-forming techniques ensured even horizontal and vertical edges. Lean concrete pours were proper. Steel reinforcement bars were properly sized and placed. Poured concrete columns, beams, and walls showed no separation of materials, which attests to the fact that the concrete was poured properly. Also, required testing (materials, soil, poured concrete, etc.) has been completed without any rejections to date.

3. Determine whether asset transfer to the GOI will likely be completed in a timely manner.

Acceptance of the project by KRG officials should be accomplished in a timely manner, primarily because of the innovative approach of including KRG ministry level officials in the initial planning of the project. Based on discussions conducted with ministry officials, ownership of the project was “assumed” from project beginning. The KRG has partnered with the U.S. government. Specifically, the U.S. government has contracted to build selected elements of the overall project valued at approximately \$10 million, and the KRG has selected other parts of the overall project valued at approximately \$5.4 million.

Recommendations and Management Comments

This report did not contain any negative findings or recommendations for corrective action; therefore, management comments were not required. When the fieldwork was completed, the results of this assessment were discussed in detail with the USACE Resident Engineer, Erbil Resident Office, and briefed to the USACE Area Engineer, Mosul Area Office. MNSTC-I and Gulf Region Division officials reviewed this report, had no comments, and offered no additional information.

Appendix A. Scope and Methodology

SIGIR announced this project assessment on 29 October 2007 and concluded fieldwork discussions on 5 December 2007. The project was performed in accordance with the Quality Standards for Inspections issued by the President's Council on Integrity and Efficiency.

In performing this Project Assessment SIGIR:

- Reviewed contract documentation to include the following: Contract, Statement of Work, Acquisition Plan, and pre-construction conference minutes;
- Reviewed the design package (drawings and specifications), quality control plan, and quality control and quality assurance reports;
- Conducted discussions with KRG officials, the USACE Resident Engineer and Deputy Resident Engineer, quality assurance representatives, and contractor personnel on site;
- Conducted an on-site assessment on 21 November 2007;
- Briefed the results of fieldwork with the USACE Area Engineer, Mosul Area Office, and the Resident Engineer, Erbil Resident Office upon completion of fieldwork; and
- Briefed this report to GRD and MNSTC-I officials on 5 December 2007.

Appendix B. Acronyms

BOQ	Bill of Quantities
CLIN	Contract Line Item Number
COR	Contracting Officer's Representative
CPATT	Civilian Police assistance training Team
FFP	Firm Fixed Price
GRD	Gulf Region Division
GRN	Gulf Region Northern District
IRMS	Iraq Reconstruction Management System
ISFF	Iraq Security Forces Fund
KRG	Kurdistan Regional Government
MOI	Ministry of Interior
NTP	Notice To Proceed
O&M	Operations and maintenance
QA	Quality Assurance
QAR	Quality Assurance Representative
QC	Quality Control
QM	Quality Management
RE	Resident Engineer
SIGIR	Special Inspector General for Iraq Reconstruction
USACE	United States Army Corps of Engineers
USG	United States Government

Appendix C. Report Distribution

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

Appendix D. 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 member who contributed to the report was:

Lloyd Wilson