

NINEWA VILLAGE ROADS  
SEGMENT 3  
GOVERNORATE OF  
NINEWA, IRAQ

**SIGIR PA-06-035**  
**APRIL 5, 2006**

# Report Documentation Page

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## SPECIAL INSPECTOR GENERAL FOR IRAQ RECONSTRUCTION

April 5, 2006

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

SUBJECT: Report on Project Assessment of Segment 3 of the Ninewa Village Roads in  
the Governorate of Ninewa, Iraq (Report Number SIGIR-PA-06-035)

We are providing this project assessment report for your information and use. We assessed the in-process construction work being performed on Segment 3 of the Ninewa Village Roads in the Governorate of Ninewa, Iraq to determine its status. This assessment was made to provide you and other interested parties with real-time information on a relief and reconstruction project underway and in order to enable appropriate action to be taken, if warranted. The assessment team included an engineer and an auditor.

As a result of the corrective actions taken and planned by management in response to the draft report, this final report includes no recommendations that required further management comments.

We appreciate the courtesies extended to our staff. This letter does not require a formal response. If you have any questions please contact Mr. Brian Flynn at (703) 343-9149 or [brian.flynn@iraq.centcom.mil](mailto:brian.flynn@iraq.centcom.mil) or Mr. Andrew Griffith, P.E., at (703) 343-9149 or [andrew.griffith@iraq.centcom.mil](mailto:andrew.griffith@iraq.centcom.mil).

Stuart W. Bowen, Jr.  
Inspector General

# Special Inspector General for Iraq Reconstruction

SIGIR PA-06-035

April 5, 2006

## Ninewa Village Roads – Segment 3 Governorate of Ninewa, Iraq

### Synopsis

**Introduction.** This project assessment was initiated as part of our continuing assessments of selected sector reconstruction activities for Facilities and Transportation. The overall objectives were to determine whether selected sector reconstruction contractors were complying with the terms of their contracts or task orders and to evaluate the effectiveness of the monitoring and controls exercised by administrative quality assurance and contract officers. We conducted this project assessment in accordance with the Quality Standards for Inspections issued by the President's Council on Integrity and Efficiency. The assessment team included a professional engineer and an auditor.

**Project Assessment Objectives.** The objective of this project assessment was to provide real-time relief and reconstruction project information to interested parties in order to enable appropriate action, when warranted. Specifically, we determined whether:

1. Project results were consistent with original objectives;
2. Project components were adequately designed prior to construction or installation;
3. Construction or rehabilitation met the standards of the design;
4. The Contractor's Quality Control plan and the U.S. Government's Quality Assurance program were adequate; and
5. Project sustainability was addressed.

**Conclusions.** The assessment determined that:

1. 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.
2. The project components were not adequately designed. The contract drawings included only basic cut and fill roadway cross sections, as well as typical details on reinforced concrete pipe culverts, curb, and retaining walls. There were no details on box culverts. In addition, the contract did not have drawings showing the plans and profile for the roadway. The drawings containing roadway vertical profiles and stations were provided directly to the contractor by the Iraq State Commission for Roads and Bridges, Ninewa office. The Project and Contracting Office was aware of this procedure; however, the U.S. Army Corps of Engineers Gulf Region - North District staff did not know that the State Commission for Roads and Bridges was providing roadway design drawings to the contractor. There appeared to be limited coordination between U.S. Army Corps of Engineers Gulf Region - North District and the Project and Contracting Office as to who had

responsibility for design and the extent of that responsibility. The contract requirements did not clearly detail the responsibility for design, nor was the design package complete with one integrated set of drawings for use by the contractor.

3. All work observed appeared to be consistent with the intent of the project. This occurred in part because the U.S. Army Corps of Engineers Resident Engineer and the Quality Assurance Representative were experienced with road construction and effectively monitored and supervised the construction efforts of the contractor. However, the contract did not have a complete design package. In addition, the contract required compliance with the Iraq Standard Specifications for Roads and Bridges, but the Mosul Resident Office did not have a copy of the standards. Testing and procedures required by the Iraq Standard could not be verified, therefore, it could not be determined whether the construction met the standards of design.
4. The Contractor Quality Control Plan consisted of five lines in an email message. No record of the plan's approval/disapproval by the U.S. Army Corps of Engineers existed. The Contractor Quality Control reports were submitted monthly and contained only a listing of items of work completed.

The U.S. Army Corps of Engineers Engineering Regulation 1110-1-12 and Standard Operating Procedure CN-100 specify requirements for a Government Quality Assurance program. Overall, the Quality Assurance program was adequate. Although security concerns prevented the Quality Assurance Representative from being on site on a regular basis during construction, a local Iraqi National hired by U.S. Army Corps of Engineers monitored field activities, and submitted Quality Assurance reports for each site visit. A deficiency log was not maintained; however deficiencies were minimal, as documented on the Quality Assurance reports. In addition, the Quality Assurance reports included project specific or detailed photographs that reinforced the information provided in the reports.

5. Sustainability was not an issue because of the quality of construction. The construction, when complete, should produce a roadway that will require only minimal maintenance over the next ten years. Further, since specialized equipment was not required by the contract, operation and maintenance manuals or training were not needed.

**Recommendations.** We recommended that the Commander, Gulf Region Division, and the Director, Project Contracting Office, should coordinate on other village road projects and require:

1. All design drawings be provided to the U.S. Army Corps of Engineers Gulf Region - North District, Area, and Resident Offices prior to starting construction. For those village road projects underway, the respective Resident Office administering the construction should be provided with the design drawings.
2. Each U.S. Army Corps of Engineers Gulf Region - North District, Area, and Resident Office have a copy of the Iraq Standard Specifications for Roads and Bridges. It is available electronically from the Project and Contracting Office Transportation Program Manager.

3. Improved communication between the Project and Contracting Office and U.S. Army Corps of Engineers-Gulf Region Division, in managing the village road design and construction efforts.

**Management Comments.** We received comments on the draft report from the Commander, Gulf Region Division, U.S. Army Corps of Engineers. The Commander responded to issues raised in the report and concurred with the recommendations.

**Evaluation of Management Comments.** Management comments addressed the issues raised in the report. The actions planned and taken were responsive to the recommendations and should correct the problems identified.

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# **Introduction**

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## **Objective of the Project Assessment**

The objective of this project assessment was to provide real-time relief and reconstruction project information to interested parties in order to enable appropriate action, when warranted. Specifically, we determined whether:

1. Project results were consistent with original objectives;
2. Project components were adequately designed prior to construction or installation;
3. Construction or rehabilitation met the standards of the design;
4. The Contractor's Quality Control (CQC) plan and the U.S. Government's Quality Assurance (QA) program were adequate; and
5. Sustainability was addressed.

## **Pre-Site Assessment Background**

### **Contract and Costs**

The Ninewa Village Roads Project is funded through the U.S. Government's appropriated Iraq Relief and Reconstruction Fund (IRRF) and administered through the Facilities and Transportation Sector of the Project and Contracting Office (PCO). The PCO awarded contract W914NS-05-0009, a firm fixed-price contract, for \$1,119,476 to the Ashour General Construction Contracting Company on 13 November 2004. The Gulf Region Division - North District of the U.S. Army Corps of Engineers (USACE-GRN) is administering the contract construction.

There were two Contact Line Items (CLINs), each for a different road segment, within the Ninewa Governate. CLIN 0001, Segment 1, covered a project length of 5 kilometers (km). The contract amount for Segment 1 was \$199,500. CLIN 0002 included Segment 3, a 16 km segment valued at \$919,976. Our assessment included only the Segment 3 portion of the contract, Project Number 17846, listed in PCO's construction database, dated 14 January 2006. At the time of our assessment, the project was reported to be 67% complete.

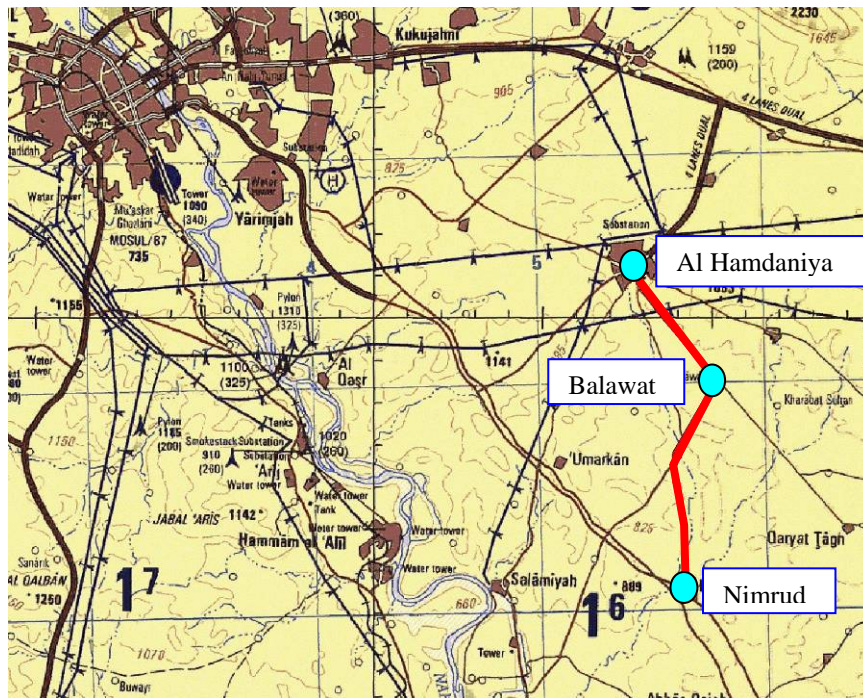
There were two modifications to the initial contract:

- Modification # P0001, issued 03 October 2005, was for a no-cost time extension which extended the contract completion date by 90 days from 21 September 2005 to 20 December 2005.
- Modification # P0002, issued 04 February 2006, was for a no-cost time extension which extended the contract completion date by 30 days from 31 May 2006 to 30 June 2006.

Based on the dates referenced in Modification #P0001 and Modification #P0002, there is a gap in time from 21 December 2005 to 31 May 2006 that is unaccounted. USACE-GRN has been asked to account for the discrepancy.

## **Project Objective**

The overall objective of Segment 3 was to complete 16 km of paved village roads throughout the Governate of Ninewa. The specific objective for Segment 3 was to construct paved roads from the village of Nimrud to the village of Balawat and from the village of Balawat to the village of Al Hamdaniya<sup>1</sup>. Site Photo 1 provides the route location between the terminal points of Al Hamdaniya and Nimrud.



**Site Photo 1: Ninewa Village Roads Segment 3 Project**

## **Description of the Facility (preconstruction)**

The description of the facility (preconstruction) was based on information obtained from the contract and the USACE project file. The existing road between the villages of Nimrud and Balawat, and the road between Balawat and Al Hamdaniya, were dirt roads. The villages are located approximately 20-25 km southeast of the City of Mosul in the Ninewa Governate. The distance between Nimrud and Balawat is 10 km and the distance between Balawat and Al Hamdaniya is 6 km. The terrain along the 16 km route is level or slightly rolling.

## **Scope of Work of the Contract**

Based on the contract Statement of Work (SOW), the major tasks for the 16 km Segment 3 village road project included:

- Earthwork (cut and fill sections)
- Building a crushed aggregate sub-base
- Paving an asphalt bituminous base course

<sup>1</sup> Due to the various spellings for cities in Iraq, and in an effort to achieve standardization in SIGIR reports, Al Hamdaniyah as noted in project documentation will henceforth be referred to as Al Hamdaniya.

- Constructing soil shoulders, and
- Providing cross drainage structures (culverts) where necessary.

## **Current Project Design and Specifications**

### **Design and Specification Requirements**

In addition to construction, there were other design tasks included in the contract SOW. The SOW required the contractor to review the existing design, revise and complete the design as necessary, and construct the roads. The existing design drawings provided in the contract included two typical cross sections of the roadway, one for a fill section, and the other for a cut section. Also the contract contained drawings that provided typical details for reinforced concrete pipe culverts, concrete retaining walls, and concrete curb. However, the contract drawings did not show the locations along the route for these items.

The contract also included a bill of quantities (BOQ) for quantifying the material requirements on the project. Listed in the BOQs were requirements and quantities for construction of:

- Cut sections (earthwork, i.e., clearing, grubbing, material removal etc.)
- Fill sections (earthwork, i.e., clearing, grubbing, adding suitable fill material, etc.)
- 30 centimeter (cm) compacted sub-base layer
- 10 cm asphalt base course layer<sup>2</sup>
- Reinforced concrete pipe culverts
- Box culverts

Although there were typical details for cut and fill sections showing the sub-base and base course cross sections, and for reinforced concrete pipe culverts, there were no details in the contract for reinforced concrete box culverts.

The SOW required the contractor to verify existing site surveys (with the Iraq Ministry of Construction and Housing), perform construction surveying and geotechnical investigations (as required), verify the Ministry survey data, and provide as-built computer-aided design (AutoCAD version 2002) drawings at the end of the project. In addition, the contractor was to verify the designs provided in the SOW, as well as the BOQ. The contractor was also required to verify the Ministry's roadway alignment, geometry, profile grades, and typical cross sections.

According to the PCO Transportation Sector Program Manager, the Iraq Ministry of Construction and Housing, the State Commission for Roads and Bridges (SCRB) division manages road construction contracts in each governate. The village road projects in the Ninewa Governate as well as the other village road projects in other governates had been planned and the route locations surveyed prior to the arrival of Coalition Forces in Iraq. The SCRB office in Ninewa Governate provided, directly to the contractor, existing drawings depicting:

- Horizontal survey controls along the 16 km route (aka stations<sup>3</sup>)

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<sup>2</sup> The base layer is the wearing surface layer of asphalt pavement.

<sup>3</sup> A station is a unit of measurement for referencing horizontal distance along the route of a highway construction project. A station consists of 1 kilometer in horizontal distance, which is subdivided in meters. For example, "Station 1+234" is a point along the project route that is 1.234 kilometers or 1,234 meters from the starting point of the project.

- Profile views of the roadway showing existing grades and the proposed road grade

The SOW requirements for design and construction work also included adherence to the specifications in the design criteria manual “Republic of Iraq; Ministry of Construction and Housing; State Organization of Roads and Bridges; Highway Design Manual; 1982 Design & Study Department; Road and Traffic Division”, and standard Iraqi specifications found in the publication “Republic of Iraq; Ministry of Construction and Housing; State Organization of Roads & Bridges; Standard Specifications for Roads and Bridges; Department of Design Studies, 1983.”

#### Design Submittal Requirements

The SOW required the submission of bituminous asphalt concrete mix designs. A review of the contract records indicated the contractor had not submitted a mix design after contract award.

The SOW required drawings and design changes, as necessary. A review of contract records, showed no submittal of drawings or design changes. Also, neither PCO nor USACE had requested drawings or design changes. Further, based on our examination of the SOW, it is unclear who has final design responsibility and approval. The contractor is required to submit drawings and design changes as necessary. The threshold or standard for when drawings were required and what drawings were needed is not identified in the SOW.

In addition, the contract provided drawings showing typical details and standard cross sections. The contract also listed a BOQ of major items of work. However, no details were provided in the contract for box culverts, which are reinforced concrete structures, supporting the roadway and traffic. Box culverts are essentially small bridge sections allowing water to flow underneath the roadway.

Further, USACE-GRN was unaware that the SCRIB provided roadway design drawings to the contractor. The coordination between USACE-GRN and PCO as to who had responsibility for design and to the extent of that responsibility could not be documented. Therefore, the contract requirements were unclear as to design responsibility. Also, the design drawings were not complete enough for project construction.

## **Site Assessment**

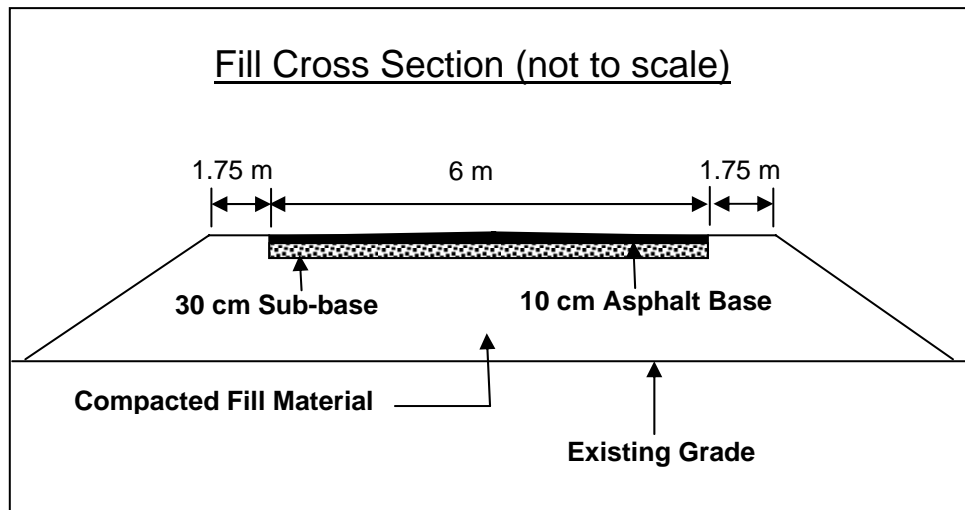
On 22 January, 2006, we performed an on-site assessment of the Ninewa Village Roads Segment 3 project. The on-site assessment included a visual check and drive of the entire 16 km route. In addition, the team stopped for an inspection of the project work at three locations along the route.

There was no construction work in progress on the day of our site assessment. According to the Resident Engineer (RE), the contractor was not working regularly for a number of reasons including material availability, escalating asphalt prices, fuel shortages, and weather delays. As a result, the project was behind schedule.

## Work Completed

### Earthwork

The contract BOQ included requirements for earthwork cut and fill sections. For fill sections, the contractor was required to clear and grub the natural ground to a depth of 10 cm and provide new suitable fill material compacted in layers of 20 cm to reach the profile contained in typical design cross section. For an illustration of a typical fill cross section, see Diagram 1.



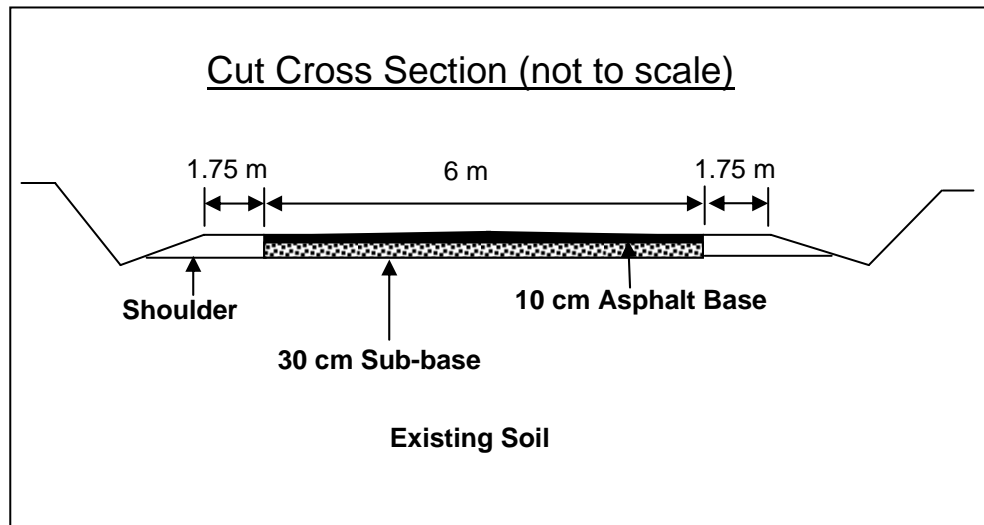
**Diagram 1. Typical fill cross section**

Site Photo 2 shows a fill section constructed between the Villages of Balawat and Nimrud.



**Site Photo 2. Fill section north of Nimrud**

On a cut section, unneeded materials are removed so as to match the elevations provided in the design profile. Diagram 2 provides an illustration of a typical cut section.



**Diagram 2. Typical cut cross section**

Site Photo 3 shows a cut section with the sub-base constructed, prior to paving and shoulder construction.



**Site Photo 3. Cut section near Balawat – Photo provided by USACE**

Based on the review of the contract and our observations on site, the cut and fill sections appeared to meet the requirements of the contract.

#### Crushed aggregate sub-base

The contract bill of quantities and typical cross section drawings required the contractor to spread the sub-base layer with a thickness of 30 cm and a width of 6.5 m in accordance with Section R6 of the Standard Specifications for Roads and Bridges, and direction from the Resident Engineer. The USACE-GRN QA Report dated 03 August 2005, showed the sub-base as 100% complete. Our assessment

confirmed the completion of the sub-base. However, since only 6 km of the 16 km roadway sub-base had been paved at the time of our assessment, the sub-base on the remaining 10 km section shown in Site Photo 4, had deteriorated and will require some rework before further paving begins.



**Site Photo 4. Compacted sub-base south of the village of Balawat**

#### Asphalt Bituminous Base Course

The contract bill of quantities and typical cross section drawings required the contractor to spread the base layer of asphalt concrete with a thickness of 10 cm and width of 6 m. The contract required the asphalt concrete paving to be in accordance with Section R9 and R8A of the Standard Specifications for Roads and Bridges, and directions from the Resident Engineer. The contractor had paved the northernmost 6 km of the project from Al Hamdaniya to just south of Balawat.

Inspection of the paved sections did not reveal any noticeable surface defects such as raveling, bleeding of asphalt, cracking, or potholes (Site Photo 5). The pavement appeared to be smooth, and ride quality of the pavement was good based on the assessment team's observations.



**Site Photo 5. Asphalt concrete pavement near village of Balawat**

The paved areas met the width and thickness requirements of the contract. Site Photos 6 shows the typical asphalt concrete thickness of approximately 10 cm along the length of the paved sections of the roadway.



**Site Photo 6. Depth of the asphalt base course**



**Site Photo 7. Location of measurement**

Section R9 of the Standard Specifications for Roads and Bridges requires the aggregate used in the asphalt mix to be crushed stone or crushed gravel. The aggregate used in the mix was rounded and intact, presumed to be uncrushed gravel. For a picture of the gravel used in the pavement, see Site Photo 8. It should be noted that the use of uncrushed gravel in asphalt concrete is standard construction practice in Iraq. This was confirmed through discussions with the Resident Engineer and the assessment team's personal observations of other roadway surfaces.



**Site Photo 8. Uncrushed gravel used in the asphalt mix (USACE photo taken 18 Dec 05)**

### Soil Shoulders

The contract required 1.75 m compacted soil shoulders in each direction. The shoulders had not been completed. We observed in some areas of the paved portion roadway, the contractor had leveled and graded the shoulder sub-base layer, but still needed to add material and compact it to bring the shoulder up to finish grade. Site Photo 9 shows the compacted sub-base for the shoulder adjacent to the pavement. In other areas, the shoulder needed to be re-graded to meet contract requirements.



**Site Photo 9. Compacted shoulder sub-base**

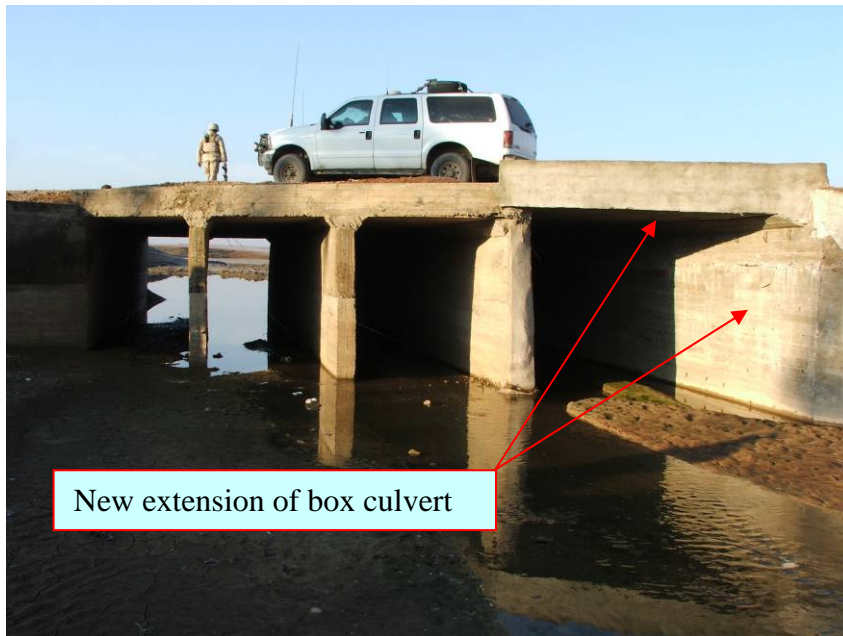
### Cross Drainage Structures (Culverts)

The contract BOQ required construction of 40 lineal meters of reinforced concrete pipe culverts in accordance with Sections R3, R5 and B8 of the Iraqi Standard Specifications for Roads and Bridges, and as directed by the Resident Engineer. The locations for the culverts were not specified in the contract; therefore the number and location of the new reinforced concrete pipe culverts could not be determined. We observed one new pipe culvert located in one of the villages. For security reasons, we were unable to stop to verify the quality of the pipe culvert construction.

A subsequent review of the QA report dated 03 August 2005 indicated the 40 linear meters of pipe culverts had been completed. Additionally, the USACE-GRN QA files contained pictures and locations of the construction of four pipe culverts. However, there were no earlier quality assurance reports (prior to 03 August 2005) or daily contractor quality control reports documenting the actual construction of the culverts.

In addition to reinforced pipe culverts, the contract required the construction of box culverts in accordance with Sections R3, R5 and B8 of the Iraqi Standard Specifications for Roads and Bridges, and as directed by the Resident Engineer. The quantity of box culverts listed in the BOQ is 150 cubic meters (m<sup>3</sup>). The BOQ also required "elongation" of existing box culverts, if necessary. Box culverts locations were not specified in the contract.

We inspected one box culvert in an unpaved section of the roadway north of the Village of Nimrud. At this location, the existing box culvert had been elongated. The new box section is shown in Site Photo 10. The reinforced concrete in the new section appeared to be constructed to standards. There was no evidence of cracking or honeycombing of the concrete. However, when inspecting the wing walls on the inlet and outlet side of the culvert, we noticed that the top of the wing walls on both sides appeared to have been refinished with a cementitious material. For an illustration of the wing wall see Site Photo 11. We could not verify if this was evidence of a cold joint or if it was a repair over surface defects since there were no daily contractor quality control reports or quality assurance reports at the time the culvert extension was constructed.



**Site Photo 10. Extended box culvert north of the village of Nimrud**

In addition to the box culvert we inspected, a second box culvert was elongated as part of this construction project. We were not able to inspect the second box culvert, although photographs in the USACE QA files show the extension constructed similarly to the culvert shown in Site Photo 10. In addition, although the 3 August 2005 QA report noted completion of the two box culverts, there was no documentation to address the quality of construction or whether the culverts met the requirements of the contract.



**Site Photo 11: Box culvert wing wall**

## **Work in Progress**

At the time of our site visit, the contractor was not working, nor was there any record of the contractor being on site during the month of January. The Resident Engineer was considering issuance of a cure notice requesting a recovery plan because of the contractor's failure to complete the project.

## **Work Pending**

Remaining work for the contractor includes paving the southernmost 10 km from just south of Balawat to Nimrud. Additionally, after completing the paving, the shoulder work needs to be completed.

## **Project Quality Management**

### **Contractor's Quality Control Program**

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

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

### **Quality Control Plan**

According to the USACE-GRN Quality Assurance Representative (QAR), the contractor had submitted a Quality Control Plan. The plan consisted of an email message comprising five lines of text. We determined it did not meet the standards addressed in ER 1180-1-6 (*Construction Quality Management*) or PCO Standard Operating Procedure CN-103 (*Contractor Construction Quality Control Plan*). Further, no record exists of approval/disapproval of the Contractor's Quality Control Plan. In addition to a Quality Control Plan, the contract required weekly construction inspection reports. The contractor submitted construction inspection reports about once a month. Further, the reports were very brief, containing only a list of major items of work completed.

### **Progress Meeting Minutes**

Because of perceived personal security risks, the contractor did not want to meet on a regular basis with USACE-GRN personnel. Therefore, meetings were very infrequent. The USACE-GRN RE and QAR maintained contact with the contractor through email and telephone conversations. In addition, later in the project, USACE-GRN employed a local Iraqi National to serve as an on-site representative when the contractor was working.

### **Testing and Inspection Reports**

The contract required testing and inspection reports, as necessary. Only two test results were included in the project files provided by USACE-GRN. The test results included an analysis of the sub-base material conducted by the Ninewa Construction Lab.

The Iraq Standard Specifications for Roads and Bridges referenced in the BOQ requires material testing on the aggregate, bituminous binder, and concrete used on

the project, as well as compactions tests on the sub-base and asphalt concrete. For example, in Section R9, the contractor is required to test the compaction of each finished course of asphalt concrete either by the bulk density method (American Association of State Highway and Transportation Officials (AASHTO) Test T166-74) or by the nuclear gauge method (ASTM D2950-74). There was no documentation in the contract files to indicate that compaction tests were performed or reported to USACE-GRN.

### **Government's Quality Assurance Program**

Engineering Regulation (ER) 1110-1-12 and PCO Standard Operating Procedure CN-100 specify requirements for a Government QA program. Because of the security situation, it was not possible for the USACE QAR to be on site every day. However, an Iraqi National QA representative has provided on-site quality assurance since August 2005. The Iraqi National filed QA reports for each day on site, which were forwarded to the USACE QAR and Resident Engineer for review and verification of progress completed for payment approval. In addition, the QAR reports were sufficiently complete and timely. Furthermore, the QAR reports included project specific or detailed photographs that reinforced the information provided in reports.

A QA deficiency log was not generated for this project. The PCO CN-102 requirement states that the QAR will maintain a QA deficiency log for all the deficiencies noted during the QA inspections, which will include digital photographs of any deficiencies noted. The USACE QAR did not maintain a QA deficiency log; however, the QAR did maintain QA reports that included digital photographs of any deficiencies noted at the site.

In our review of the QAR reports, we found only one recurring deficiency noted on the reports. That deficiency was the contractor's slow pace in completing the required work. The contract completion date was 20 December 2005, and the contractor was reported to be 67% complete. At the time of our assessment, the USACE RE and QAR were working with the contractor to resolve the schedule issues and formulate a corrective action plan.

Another aspect of quality assurance is enforcement of contract requirements. The contract BOQ required the work to be completed in accordance with the Iraq Standard Specifications for Roads and Bridges. Yet, in discussions with the USACE RE and QAR, they indicated the Mosul Resident Office does not have a copy of the Iraq Standard Specifications for Roads and Bridges.

### **Project Sustainability**

A review of the contract file, the site visit, and discussions with the USACE RE and QAR disclosed no sustainability issues associated with the project. There was no specialized equipment provided by the contract, nor was there a need for any maintenance manuals. The contract requires a "Taking-Over-Certificate" to be signed by a representative of the Iraq Ministry of Construction and Housing after the final inspection, completion of punch list items, and turnover of final as-built drawings. After the Taking-Over-Certificate is signed by the Ministry of Construction and Housing, future maintenance of the Segment 3 Roads will be the SCRB's responsibility.

## Conclusions

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

1. Determine whether project results were consistent with original objectives.

The project is listed as 67% complete. However, the completed 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.

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

The contract drawings included only basic typical cut and fill roadway cross sections, as well as typical details on reinforced concrete pipe culverts, curb and retaining walls. There were no details on box culverts. In addition, the contract did not have drawings showing the plans and profile for the roadway. The drawings containing vertical profiles and stations were provided directly to the contractor by the Iraq State Commission for Roads and Bridges office in Ninewa. PCO was aware of this procedure, but USACE-GRN staff did not know that SCRIB was providing roadway design drawings to the contractor. There appeared to be limited coordination between USACE-GRN and PCO as to who had responsibility for design and to the extent of that responsibility. The contract requirements did not clearly detail the responsibility for design, nor was the design package complete with one integrated set of drawings for use by the contractor.

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

All work observed appeared to be consistent with the intent of the project. This occurred in part because the USACE Resident Engineer and USACE QAR were very experienced with road construction and effectively monitored and supervised the construction efforts of the contractor.

However, the contract did not have a complete design package as noted above. In addition, the contract required compliance with the Iraq Standard Specifications for Roads and Bridges, but the Mosul Resident Office did not have a copy of the standards. Testing and procedures required by the Iraq Standard could not be verified, therefore, it could not be determined whether the construction met the standards of design.

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

The CQC plan submitted by the contractor consisted of five lines in an email message. There was no record of the plan's approval/disapproval by the USACE. The CQC reports were submitted monthly and contained only a listing of items of work completed.

The USACE Engineering Regulation ER 1110-1-12 and PCO Standard Operating Procedure CN-100 specify requirements for a Government Quality Assurance program. Overall, the QA program was adequate. Although security concerns prevented the QAR from being on site on a regular basis during construction, a local

Iraqi National hired by USACE monitored field activities, and submitted QA reports for each site visit. A deficiency log was not maintained, but deficiencies were minimal, and documented on the QA reports. In addition, the QA reports included project specific or detailed photographs that reinforced the information provided in the reports.

5. Determine if project sustainability was addressed.

Because of the quality of construction, sustainability was not an issue. The construction when complete should produce a roadway that will require only minimal maintenance over the next ten years. Further, since there was no specialized equipment required by the contract, operation and maintenance manuals or training are not needed.

## **Recommendations**

The Commander, Gulf Region Division, and the Director, Project Contracting Office should coordinate on other village road projects and require:

1. Design drawings prepared by the Iraq SCRB that are to be used by the contractor for constructing village roads should be provided to the respective GRD District, Area and Resident Offices prior to construction starting. For those village road projects underway, the particular Resident Office administering the construction should be provided with the design drawings prepared by the SCRB.
2. Each GRN District, Area, and Resident Office has a copy of the Iraq Standard Specifications for Roads and Bridges. It is available electronically from the PCO Transportation Program Manager.
3. Improved communication between the two organizations in managing the village road design and construction efforts.

## **Management Comments**

We received comments on the draft report from the Commander, Gulf Region Division, U. S. Army Corps of Engineers. The Commander responded to issues raised in the report and concurred with the recommendations.

1. The Commander explained the circumstances which resulted in the Mosul Resident Office not enforcing the contract requirements for road design drawings. The Commander concurred with the recommendation noting: “Effectively immediately, GRN requires that all contract terms be met on all currently active contracts and will do the same on future contracts.”
2. The U.S. Army Corps of Engineers Gulf Region Division-North District has obtained an electronic copy of the Iraq Standard Specifications for Roads and Bridges and it is stored electronically on their shared drive for all employees to utilize.
3. The Commander, U.S. Army Corps of Engineers, Gulf Region Division, concurred noting: “Dialog between GRD directorates/sections and districts will be regularly

reinforced during staff meetings and commanders' conferences." Specific to the Ninewa Village Roads project, the Mosul Resident Engineer planned to set up a teleconference with the U.S. Army Corps of Engineers, Gulf Region Division Reconstruction Directorate to clarify roles and responsibilities.

## **Evaluation of Management Comments**

Management comments addressed the issues raised in the report. The actions planned and taken were responsive to the recommendations and should correct the problems identified.

## **Appendix A. Scope and Methodology**

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

In performing this Project Assessment we:

- Reviewed contract documentation to include the following: Contract, Contract Modifications, Contract documentation, and Statement of Work;
- Reviewed the design package (drawings and specifications), Quality Control Plan, Contractor's Quality Control Reports, Testing Reports, and Quality Assurance Reports;
- Interviewed the U.S. Army Corps of Engineers Resident Engineer, Quality Assurance Representative, and the Project and Contracting Office Transportation Program Manager; and
- Conducted an on-site assessment and documented results at the Ninewa Village Roads-Segment 3 Project in the Ninewa Governate, Iraq.

## Appendix B. Acronyms

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BOQ	Bill of Quantity
cm	centimeter
CQC	Contractor Quality Control
ER	Engineering Regulation
GRN	Gulf Region North
Km	kilometer
m	meter
m <sup>3</sup>	cubic meter
PCO	Project and Contracting Office
QA	Quality Assurance
QAR	Quality Assurance Representative
RE	Resident Engineer
SOW	Statement of Work
USACE	United States Army Corps of Engineers
USACE-GDN	United States Army Corps of Engineers, Gulf Region Division - North District

## **Appendix C. Report Distribution**

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### **Department of State**

Secretary of State

Senior Advisor to the Secretary and Coordinator for Iraq

U.S. Ambassador to Iraq

Director, Iraq Reconstruction Management Office

Inspector General, Department of State

### **Department of Defense**

Secretary of Defense

Deputy Secretary of Defense

Director, Defense Reconstruction Support Office

Under Secretary of Defense (Comptroller)/Chief Financial Officer

Deputy Chief Financial Officer

Deputy Comptroller (Program/Budget)

Inspector General, Department of Defense

### **Department of the Army**

Assistant Secretary of the Army for Acquisition, Logistics, and Technology

Principal Deputy to the Assistant Secretary of the Army for Acquisition,

Logistics, and Technology

Deputy Assistant Secretary of the Army (Policy and Procurement)

Assistant Secretary of the Army for Financial Management and Comptroller

Chief of Engineers and Commander, U.S. Army Corps of Engineers

Commanding General, Gulf Region Division

Auditor General of the Army

### **U.S. Central Command**

Commanding General, Multi-National Force - Iraq

Commanding General, Joint Contracting Command – Iraq/Afghanistan

Commanding General, Multi-National Corps – Iraq

Commanding General, Multi-National Security Transition Command – Iraq

Commander, Joint Area Support Group – Central

### **Other Defense Organizations**

Director, Defense Contract Audit Agency

## **Other Federal Government Organizations**

Director, Office of Management and Budget  
Comptroller General of the United States  
Inspector General, Department of the Treasury  
Inspector General, Department of Commerce  
Inspector General, Health and Human Services  
Inspector General, U.S. Agency for International Development  
Mission Director – Iraq, U.S. Agency for International Development

## **Congressional Committees and Subcommittees, Chairman and Ranking Minority Member**

### **U.S. Senate**

Senate Committee on Appropriations  
    Subcommittee on Defense  
    Subcommittee on State, Foreign Operations and Related Programs  
Senate Committee on Armed Services  
Senate Committee on Foreign Relations  
    Subcommittee on International Operations and Terrorism  
    Subcommittee on Near Eastern and South Asian Affairs  
Senate Committee on Homeland Security and Governmental Affairs  
    Subcommittee on Federal Financial Management, Government Information and International Security  
    Subcommittee on Oversight of Government Management, the Federal Workforce, and the District of Columbia

### **U.S. House of Representatives**

House Committee on Appropriations  
    Subcommittee on Defense  
    Subcommittee on Foreign Operations, Export Financing and Related Programs  
    Subcommittee on Science, State, Justice and Commerce and Related Agencies  
House Committee on Armed Services  
House Committee on Government Reform  
    Subcommittee on Management, Finance and Accountability  
    Subcommittee on National Security, Emerging Threats and International Relations  
House Committee on International Relations  
    Subcommittee on Middle East and Central 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 members who contributed to the report were:

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