FINAL CLOSEOUT REPORT
TO 24 –Bamyan-Dushi Road Design

AFGHANISTAN INFRASTRUCTURE REHABILITATION PROGRAM (AIRP)

CONTRACT NUMBER 306-I-00-06-00517-00

Project Start Date: 09 June 2009

Project Finish Date: 30 April 2011

DISLAIMER

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CLOSEOUT REPORT FOR TO-24 BAMYAN–DUSHI ROAD DESIGN

1 TASK ORDER OVERVIEW

1.1 Background and Summary of Scope of Work

The Ministry of Public Works (MPW) has categorized the Bamyan-Dushi Road as a National Highway that merits a high level of attention because of its strategic importance in providing an alternate route to the Salang Tunnel for travel between the north and central provinces of Afghanistan. Presently however, the Bamyan-Dushi Road is virtually impassable during the winter months and entails arduous detours during other seasons of the year. The design of an asphaltic concrete paved road is the first step in the provision of a year around alternative route to the Salang Pass. The new national highway would also increase security by reducing the time needed to respond to local, regional, or national incidents, facilitate access to social services, and provide new regional trade opportunities to include agriculture and mining.

Before: Bamyan-Dushi road

In June 2009 the United States Agency for International Development (USAID) awarded The Louis Berger Group/Black & Veatch Special Projects Joint Venture (LBG/B&V) Task Order 24 (TO24) under the Afghanistan Infrastructure and Rehabilitation Program (AIRP). The scope of TO24 was for LBG/B&V to provide USAID with the complete design for the National Highway from the City of Bamyan in a northeasterly direction to the City of Dushi.

During the period of performance the task order was modified six times as provided in the table below.

Date	Modification #	Description of Scope Modification
1 June 2009	Original TO24	Provide complete design for a road (National Highway) from the City of Bamyan in a northeasterly direction to the City of Dushi.
30 September 2009	Mod number 1	Add the gravel upgrades and winter maintenance of the Bamyan to Dushi Road for a total of 164 KM during the winter of 2009/2010.
28 February 2010	Mod number 2	Add an additional 14 KM of road winter maintenance along the Bamyan to Dushi Road for a total of 178 KM.
28 April 2010	Mod number 3	Full obligation of the TO; no change to the scope of work
1 July 2010	Mod number 4	Reduce the limits of the design work from 164 KM to 151 KM.
1 August 2010	Mod number 5	Add the advertising and soliciting of bids from contractors for the construction of Phase 1 of the Bamyan to Dushi Road (0+000 to 85+800)
15 December 2010	Mod number 6	Add the gravel upgrades and winter maintenance of the Bamyan to Dushi Road for a total of 160 KM during the winter of 2010/2011.

1.2 Task Order Goals and Objectives

The goals and objective of this task order are to provide USAID with a design and construction bid package for the entire road alignment and, during the winter season, to provide a completely passable road as an alternative to the Salang Pass to support military supply traffic. LBG/B&V utilized a combination of hired, procured and subcontracted resources to meet the goals and objectives of this task order.

1.3 Milestones

The period of performance for this task order was 684 calendar days (15 June 2009 through 30 April 2011). Below is a listing of major milestones scheduled and achieved for the work required by this task order:

Milestone	Original Schedule	Achieved Date
Issue TO	1 June 2009	15 June 2009
Submit 30% Design of Segments 1 and 2 (0+000 to 85+000) for Review	13 December 2009	15 December 2009
Submit 70% Design of Segments 1 and 2 (0+000 to 85+000) for Review	13 March 2010	28 March 2010
Submit 100% Design of Segments 1 and 2 (0+000 to 85+000) for Review	11 June 2010	18 August 2010
Submit 30% Design of Segments 3 and 4 (85+000 to 150+800) for Review	13 March 2010	28 March 2010
Submit 70% Design of Segments 3 and 4 (85+000 to 150+800) for Review	11 June 2010	26 June 2010 (Section 3) 13 July 2010 (Section 4)
Submit 100% Design of Segments 3 and 4 (85+000 to 150+800) for Review	09 September 2010	16 October 2010
Start Date for Winter Maintenance 2009/2010	1 November 2009	21 November 2009
Completion Date for Winter Maintenance 2009/2010	30 April 2010	15 September 2010
Advertise Phase I Construction	01 September 2010	13 September 2010
Start Date for Winter Maintenance 2010/2011	29 December 2010	06 January 2011
Completion Date for Winter Maintenance 2010/2011	30 April 2011	30 April 2011

1.4 Deliverables

Deliverables include the following:

- Security Plan
- Demining Plan
- Quality Control Plan
- Quality Assurance Plan
- Risk Assessment Report
- 30% Design – Segments 1, 2, 3 and 4
- 70% Design - Segments 1, 2, 3 and 4

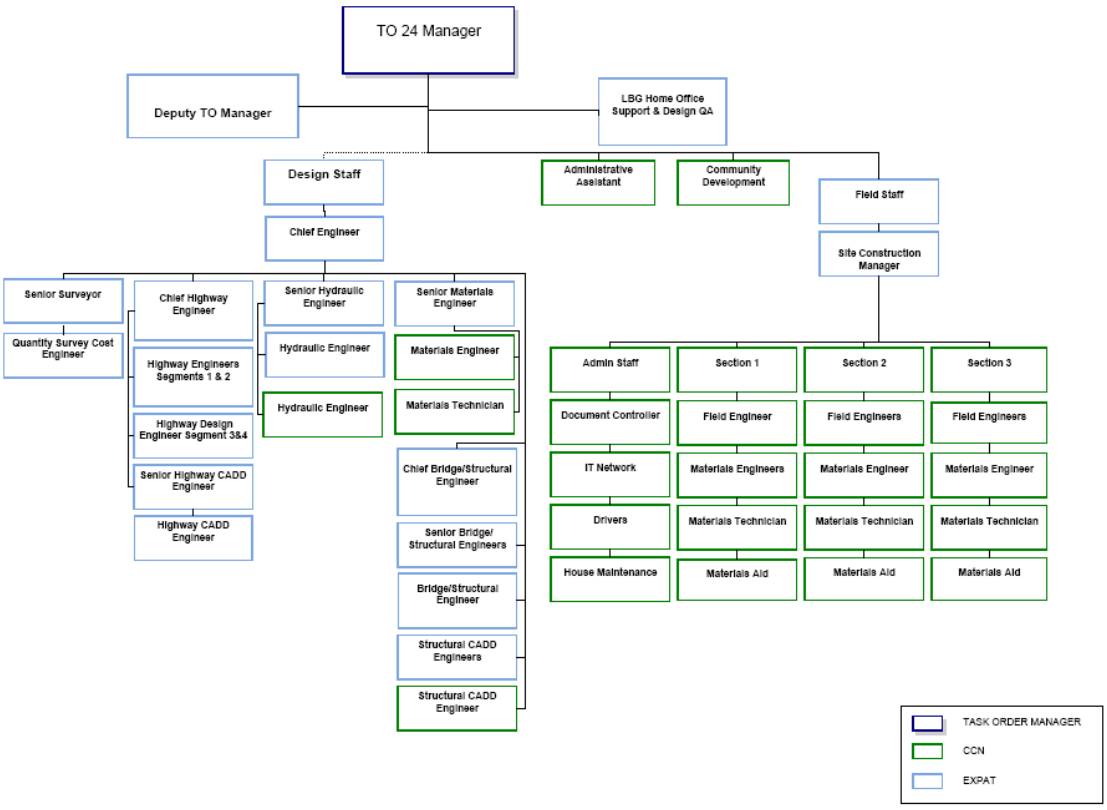
- Final Design – Segments 1, 2, 3 and 4
- 6 sets of hard and soft copies of Final Designs
- Needs Assessment Plan for Outreach and Capacity Building
- Listing of Pre-qualified Bidders for Segments 1, 2, 3 and 4
- BOQ and Cost Estimate – Segments 1, 2, 3 and 4
- Revised BOQ based on Value Engineering Assessment
- Critical road maintenance and snow removal for 160 km during 2009/2010 and 2010/2011 winter seasons
- Phase 1 Final Design in 4 distinct packages – Segment 1A, Segment 1B, Segment 2A, Segment 2B
- Advertisement and Receipt of Bids for Phase 1 Construction - Segment 1A, Segment 1B, Segment 2A, Segment 2B

Electronic copies of these documents are included in the external hard disk that is submitted with this report.

2 TASK ORDER EXECUTION

2.1 Task Order Organizational Structure

An organizational chart of LBG/B&V staff for this Task Order is provided below:



2.2 In-country and home office resources

The Task Order Manager who oversaw the design project was principally based in Kabul. For the winter maintenance and snow removal operations of 2009/2010 and 2010/2011 the Site Construction Manager and Site Verification Team were based at two locations: a) at the construction camp located at km 72 and, b) in a guesthouse located in the city of Dushi. Financial, logistical, and IT support was based at the camp with additional logistical, financial, IT, and design assistance provided by staff in the main office in Kabul.

Before: survey team

The IQC Manager and contractual support staff were based in the headquarters of the Louis Berger Group in Washington, DC. The preparation of invoices and cost reporting functions for the Task Order were also performed by staff at the Louis Berger Group office in Washington, DC.

2.3 Implementation of Work

The implementation of work was as follows:

2.3.1 Management

IQC and Chief of Party responsibilities remained as per other Task Orders. Primary management supervision for this Task Order was the responsibility of the Task Order Manager.

2.3.2 Task Order Manager

The Task Order Manager assumed the overall authority for t task order implementation and was responsible for all related contract management, client coordination, correspondence, invoicing, mobilization of personnel, and other project management activities in coordination with the Deputy Task Order Manager, Design Manager, Site Construction Manager, and fellow AIRP management.

2.3.3 Deputy Task Order Manager

The Deputy Task Order Manager was a native of Afghanistan and was responsible for the day to day management of the predominantly native Afghan project staff. He played a major role in all project reporting, communications, planning, and execution.

During: Rough grading work at Km 159+300

2.3.4 Design Manager

The Design Manager was responsible for the oversight, management, operations and production of the design team. The Design Manager reported to the AIRP Transport Sector Lead but answered to the Task Order Manager for all matters related to Task Order 24. The design manager was located in Kabul but visited the project site as necessary.

2.3.5 Site Construction Manager

The Site Construction Manager was the primary point-of-contact for the day-to-day field operations and had onsite supervisory responsibility for the technical requirements of the subcontractors, including adherence to the quality performance standards identified in the design drawings and specifications. He was located at the field office on a full time basis to coordinate construction supervision, quality assurance, camp operations, subcontractor oversight, and documentation. He coordinated, prepared, and conducted progress meetings on a daily basis with the construction monitoring staff and on a weekly basis with the subcontractor management teams. The Site Construction Manager reported directly to the Task Order Manager.

During: Stonemasonry Work

2.3.6 Field Project Office and Guest House

LBG/B&V established a project office in a construction camp approximately midway along the Bamyan to Dushi roadway alignment and at a guest house in the town of Dushi for the purpose of managing and supporting all field activities. The various subcontractors also setup camps and field offices in support of their respective field activities.

2.3.7 Design of Bamyan – Dushi Road

The design of the Bamyan – Dushi Road was performed in accordance with AASHTO and Afghanistan Ministry of Public Work design standards and roadway classifications. A detailed description of the design criteria and design methodology is included in the TO-24 Project Assessment Report which can be found in Appendix 1 of this report.

The entire 151 kilometer alignment was divided in to four sections:

- Section 1 – 0+000 to 40+000,
- Section 2 – 40+000 to 85+000,
- Section 3 – 85+000 to 120+000, and
- Section 4 – 120+000 to 151+000.

Sections 1, 2, and 3 were designed by LBG/B&V staff located in Kabul, Afghanistan, with quality assurance reviews conducted by LBG interdivisional staff located in Raleigh, NC, and LBG home office support located in Morristown, NJ, and Washington, DC. Section 4 was designed by LBG interdivisional staff located in Raleigh, NC, with quality assurance reviews by LBG/B&V staff located in Kabul and LBG home office support.

2.3.8 Security

LBG/B&V utilized the AIRP Northern Security IQC subcontractor, Hart Security, to provide security services. See Section 3 below for a full description of services.

After: Compacting of road 4+800

2.3.9 Demining Technical Survey

LBG/B&V utilized the services of RONCO Consulting Corporation to conduct a 30% Technical Survey, 21 meters on either side of the center lines from Bamyan to Dushi to a minimum depth of 130 mm for landmines. RONCO also provided a 30% Technical Survey for the LBG/B&V camp site.

After: Compaction of Bamyan –Dushi Road

2.3.10 Winter Maintenance of the Bamyan – Dushi Road

The winter maintenance for the entire 164 kilometer alignment during both winter seasons was divided into three sections.

- Section 1 – KM 0+000 to 60+000
- Section 2 – KM 60+000 to 120+000
- Section 3 – KM 120+000 to 164+000 (150+800 during the Winter 2010/2011 season)

All three sections were subcontracted to road construction/maintenance contractors for grading and compaction, culverts, road protection and snow removal activities during both winter seasons. All quality assurance of the subcontractors operations was performed by LBG/B&V staff based at either the LBG field camp which is located at approximately KM 70+000 in the Tala Wa Barfak district of Afghanistan or the Dushi guest house. While on excursions in or around the town of Bamyan, LBG/B&V staff rented accommodations in local hotels situated in the town of Bamyan.

2.3.11 Project Location

The project location is shown on Figure 1 below.

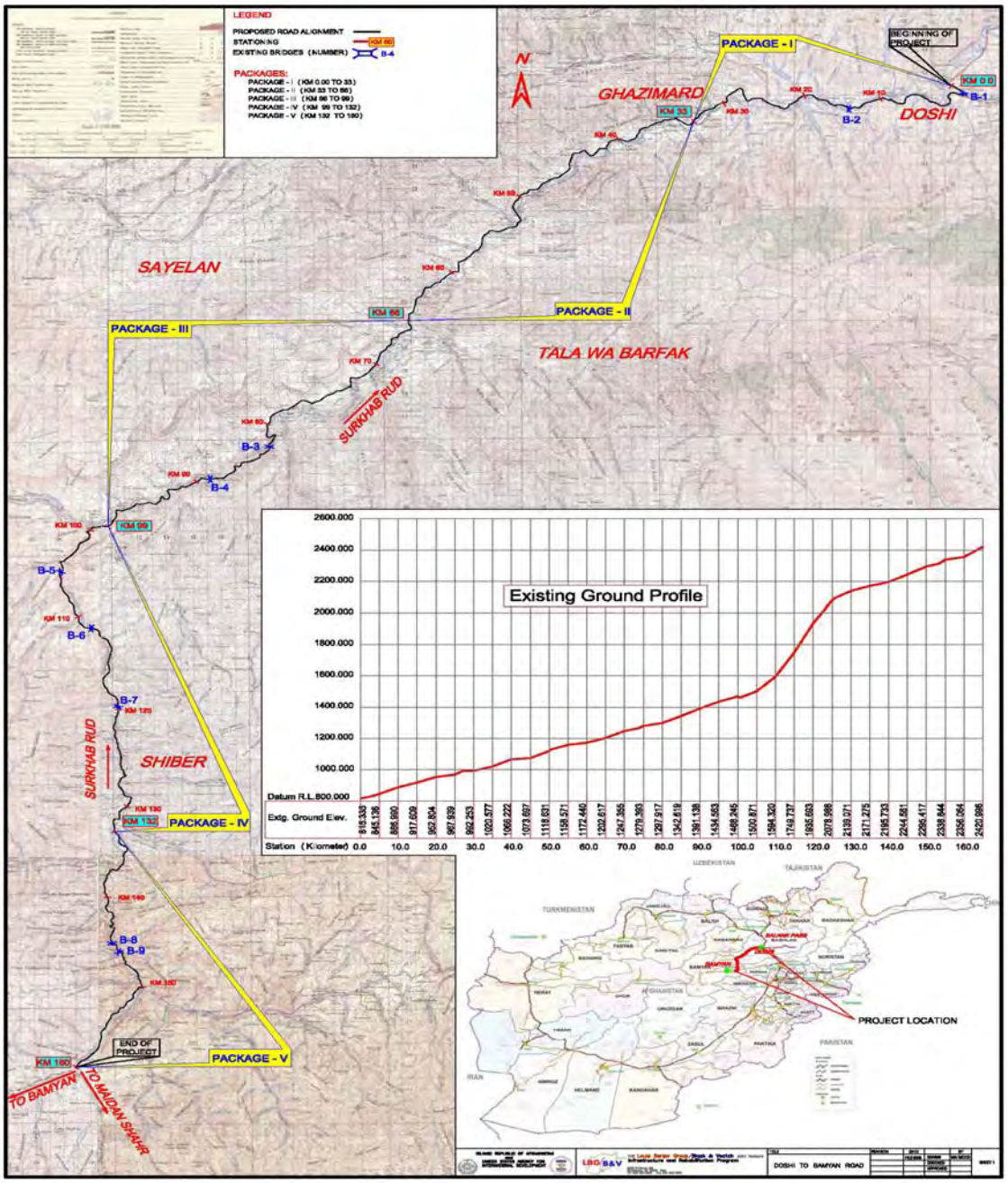


Figure 1 – Location of Bamyan - Dushi Road

2.4 Major Subcontracted Work Elements

The major subcontracted elements of work included:

2.4.1 Engineering Design and Quality Assurance

LBG/B&V issued Interdivisional agreements between LBG/B&V and two LBG domestic operations divisions for engineering design and quality assurance services.

Company Name	Description	Home Office Location	Final Subcontract Value	Start Date	Completion Date
LBG/OR Division	Quality Assurance for Design of Sections 1, 2, and 3, and Design of Section 4	Raleigh, NC (USA)	$1,369,704.15	1 Jan 2010	15 Dec 2010
LBG/JU Division	Subsurface Investigation Survey	Morristown, NJ (USA)	$112,150.66	15 Jun 2009	15 Dec 2010

2.4.2 Demining Technical Survey

LBG/B&V issued a subcontract to RONCO Consulting Corporation for demining services.

Company Name	Description	Home Office Location	Final Subcontract Value	Start Date	Completion Date
RONCO Consulting Corporation	30% Demining Technical Survey	Washington, DC (USA)	$651,514.72	27 Aug 2009	25 Dec 2009

2.4.3 Field Based Private Security

LBG/B&V utilized the AIRP Northern Security IQC Contract with Hart Security for security services. Security delivery orders funded under this task order were issued as needed.

Company Name	Description	Home Office Location	Final Subcontract Value	Start Date	Completion Date
Hart Security, LTD	Private Security Services	Nicosia, Cyprus	$1,350,461.64	31 Jul 2009	28 Aug 2010

2.4.4 Camp Construction

LBG/B&V issued a subcontract to Afghan Bena Construction Company for the construction of a Temporary Construction Camp.

Company Name	Description	Home Office Location	Final Subcontract Value	Start Date	Completion Date
Afghan Bena Construction Company	Temporary Camp Setup	Kabul, Afghanistan	$95,587.00	28 Sep 2009	15 Feb 2010

2.4.5 Geotechnical Engineering

LBG/B&V issued a subcontract to GEOS Geoteknik for geotechnical engineering services and route engineering geologic mapping.

Company Name	Description	Home Office Location	Final Subcontract Value	Start Date	Completion Date
GEOS Geoteknik	Geotechnical Engineering Services	Istanbul, Turkey	$414,250.00	25 Sep 2009	05 Jan 2010

2.4.6 Winter Maintenance and Snow Removal Services

2.4.6.1 Winter Maintenance Snow Removal 2009/2010

LBG/B&V issued subcontracts to three local subcontractors for winter maintenance and snow removal during the winter season of 2009/2010.

Company Name	Description	Home Office Location	Final Subcontract Value	Start Date	Completion Date
Faizi Masroor Construction Company (FMCC)	Section 1 – 0+00 to 60+00	Kabul, Afghanistan	$450,968.50	21 Nov 2009	31 May 2010
Golden City Company/Erector Construction & Road Building Co. JV. (GCC-ECRC JV)	Section 2 – 60+00 to 120+00	Kabul, Afghanistan	$1,148,155.88	21 Nov 2009	15 Sep 2010
Class Construction Group (CCG)	Section 3 – 120+00 to 164+00	Kabul, Afghanistan	$705,004.00	21 Nov 2009	20 Jul 2010

2.4.6.2 Winter Maintenance Snow Removal 2010/2011

The scope for winter maintenance snow removal 2010/2011 in all three sections of the Bamyan-Dushi road was subcontracted to a local subcontractor from Bamyan province.

Company Name	Description	Home Office Location	Final Subcontract Value	Start Date	Completion Date
Shahfoladi Construction Company (SCC)	Section 1 – 0+00 to 60+00	Bamyan, Afghanistan	$107,300.00	6 Jan 2011	30 Apr 2011
Shahfoladi Construction Company (SCC)	Section 2 – 60+00 to 120+00	Bamyan, Afghanistan	$173,461.50	6 Jan 2011	30 Apr 2011
Shahfoladi Construction Company (SCC)	Section 3 – 120+00 to 156+00	Bamyan, Afghanistan	$103,820.00	6 Jan 2011	30 Apr 2011

2.5 Major Procurement

The major procurement activities for this Task Order included:

- Kabul Based Guesthouse and Office Rental and associated Operational Supplies and Services
- Labor, Equipment, Materials, and Supplies for Camp Construction and Operation
- Rental Vehicles for Dushi Guest House and Tala Camp
- Diesel Fuel for Camp and Guest House Generators and LBG/B&V Armored Vehicles
- Supply and Delivery of Food Supplies to Field Camps

2.5 Task Order Budget and Expenditures

2.5.1 Task Order Modification History

Task Order 24 was an incrementally funded, cost plus fixed fee completion form task order. A summary of the modifications to the Total Estimated Cost (TEC) and Total USAID Obligated Amounts (TOA) is provided below in Table 1.

Table 1 – Summary of Modifications to Total Estimated Cost (TEC) and Obligated Funding

Description	Date	Total Estimated Cost	Total USAID Obligated Amount
Initial Task Order Award	6/15/2009	$9,735,520.05	$4,000,000.00
Modification #1 – Increase TEC and TOA	9/30/2009	$12,735,520.05	$7,000,000.00
Modification #2 – Scope Change with No Additional Cost	02/25/10	$12,735,520.05	$7,000,000.00
Modification #3 – Increase TOA	4/28/2010	$12,735,520.05	$12,735,520.00
Modification #4 – Scope Change and Decrease to TEC and TOA	7/1/2010	$12,684,240.60	$12,684,240.55
Modification #5 – Scope Change with No Additional Cost	8/18/2010	$12,684,240.60	$12,684,240.55
Modification #6 – Scope Change with No Additional Cost	8/18/2010	$12,684,240.60	$12,684,240.55

2.5.2 Final Task Order Budget and Costs

A summary of the final Task Order budget including all incurred costs and projections as of 01 June 2011 is provided below in Table 2.

Table 2 – Summary of Final Task Order Budget

TO 24 – Design of Bamyan to Dushi Road					
Description	Budget thru Mod 6	Billed thru Invoice #30	Estimated at Completion	Estimated Remaining to be Billed	Variance
Program Support Costs	$3,435,128.42	$ 3,696,664.13	$ 3,724,446.81	$ 27,782.68	($ 289,318.39)
Subcontracts	$7,567,858.00	$ 6,577,561.12	$ 6,748,890.86	$ 171,329.74	$ 818,967.14

Indirect Costs	$1,130,279.05	$ 1,117,444.40	$ 1,134,072.61	$ 16,628.21	($ 3,793.56)
Fixed Fee	$550,975.13	$ 455,180.25	$ 550,975.13	$ 95,794.88	$ 0.00
Total	$12,684,240.60	$11,846,849.90	$ 12,158,385.41	$ 311,535.51	$ 525,855.19

3 SECURITY

All aspects of security are managed and coordinated by the AIRP Security Manager and his Kabul based team. Security for TO24 was provided by subcontractors at two independent levels. For work performed in Kabul, and for helicopter or road missions to and from Kabul, security was provided at the program level by Strategic Security Solutions International (SSSI) that was subcontracted and paid under Task Order 1. For work performed along the Bamyan to Dushi Road alignment, security was provided by Hart Security Limited that was subcontracted and paid for under Task Order 24. All field based subcontractors were required to hire their own security resources.

A summary of the security incidents reports that were submitted during the task order period of performance can be found in Appendix 2.

Delivery Orders were issued against Northern Security subcontract for the following:

- Security services for the LBG/B&V personnel
  - Tactical Operations Center (TOC) with the Security subcontractor
  - Physical security of the project office
  - Escort security to and from the project work sites
  - Escort services for LBG/B&V staff off the project work site

4 SAFETY PROGRAMS/PLANS

LBG/B&V operated under a program-wide safety program that was managed by the AIRP Health and Safety Coordinator.

5 QUALITY CONTROL PROGRAM/PLAN

Quality Control and Quality Assurance were continuous processes during the lifetime of the project with specific reviews conducted at appropriate intervals to minimize rework and costly revisions to the project documents. LBG/B&V developed QC/QA plans from LBG corporate templates for the Bamyan-Dushi Road Design Project. LBG/B&V utilized the LBG Raleigh, NC, office for scheduled QA reviews of all design documents.

The final design conformed to the Afghanistan Road Sector Master Plan dated April 2006, to the Vertical and Horizontal Alignment of MPW Interim Road and Highway Standards, dated 18 March 2007, and to the latest editions of AASHTO highway design standards for road geometrics and bridges.

6 TASK ORDER SCHEDULE

The final schedule which details all significant actions and project deliverables during the Task Order 24 period of performance can be found in Appendix 3.

7 VALUE ENGINEERING CHANGES

USAID contracted a third party engineering company to review the 70% submittal of the Bamyan – Dushi Road design. LBG/B&V reviewed the value engineering recommendations and incorporated all acceptable comments in the final design deliverable.

8 LESSONS LEARNED

Issue	Lesson	Recommendation
Coordination with Other Projects	The original scope of work for the design of Bamyan to Dushi Road was 164 kilometers which extended to the junction at Maidan Shahr Road. Ultimately, approximately 13 kilometers were descoped from the LBG/B&V limits of work.	Better coordination of adjacent projects among donor agencies regarding the exact limits of work to be performed.
Value Engineering Assessment	USAID hired a third party engineering firm to perform a value engineering assessment of the 70% design drawings. This VEA was found to be beneficial to the LBG/B&V design team and enhanced the quality of the final product.	Continue to conduct third party VEAs on future design projects.
Winter Maintenance and Snow Removal Contracting	During the two consecutive years of LBG/B&V supervised winter maintenance a heavy snow season occurred in 2009/2010 and a very light snow season in 2010/2011. The 2010/2011 WM subcontractor complained that equipment sat idle for most of the contract period, leading the subcontractor to claim to have lost considerable sums of money due to the light snow season.	Performance based contracts with a lump sum monthly rate should be used for winter maintenance subcontracts.
Spring Maintenance	During the past two spring seasons LBG/B&V have witnessed substantial mud/rock slides and high river flows due to the spring rains and snow melt.	The winter maintenance period should extend beyond 30 April until mid June on future contracts.

9 OUTSTANDING ISSUES:

There are four outstanding issues related to the complete close out of Task Order 24.

The first issue is that the final invoice from LBG/B&V will not be submitted until January 2012. The reason for the delay in this submission is the need for the adjusted overhead rates for the current fiscal year, final closeout, and release of the subcontractor invoices.

The second outstanding issue is a potential claim by the winter maintenance 2010/2011 subcontractor. The subcontractor has complained that it lost over $200,000 on the project due to idle equipment because of light snow fall during the winter of 2010/2011. The contractor has also indicated that the cost of insurance paid by the subcontractor was based on a combined subcontract value of $926,150 while the final combined value of the subcontracts was $384,581.50; as a result, the contractor has stated an intention to claim for the difference in the cost of insurance coverage for each subcontract. As of the submission of this report, no claims have been received by LBG/B&V.

The third outstanding issue is a final inspection that was requested by the USAID COTR. While final inspections have not been previously held on winter maintenance work in the past, LBG/B&V is coordinating the scheduling of this inspection to be held in June 2011.

The fourth outstanding issue is that the validity of the bids received by LBG/B&V for the construction of the four segments of Phase 1 of the Bamyan to Dushi Road under this task order were extended until 15 September 2011. With the closeout of this task order, LBG/B&V has no scope of work to perform the evaluation of the bids if this task is required in the future.

APPENDIX 1

TO-24 Bamyan Dushi Road Design

Project Assessment Plan

ISLAMIC REPUBLIC OF AFGHANISTAN
AND
UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT

AFGHANISTAN INFRASTRUCTURE AND REHABILITATION PROGRAM
(AIRP)

PROJECT ASSESSMENT REPORT
FOR
TASK ORDER 24
DESIGN OF BAMYAN TO DUSHI ROAD

***Prepared for*:**
UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT
Kabul, Afghanistan

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DECEMBER 2009

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1. OVERVIEW

1.1. PROJECT NAME AND CLIENT

Project Name: Task Order 24, Contract No. 306-I-24-00517-00
Design of Bamyan to Dushi Road

Project Client: United States Agency for International Development
Kabul, Afghanistan

1.2. PROJECT DESCRIPTION

The project starts at the intersection with Kabul to Dushi part of ring road in Baghlan province at about Km 160 from Kabul,Sta 0+000 with coordinates of N3,939,920.182, E472,334.273 and ends at the intersection with road to Maidan Shar in Bamyan province along the Charikar Bamyan road with coordinates of N3,855,522.499, E407,570.077. The total length of the project road is about 164 kms. The existing road is aligned west from the project start to about 30 kms then going southwest for about 70 kms, then aligned south for about 50 kms up to the intersection with Charikar-Kabul Road and then aligned southwest for about 14kms along Charikar-Bamyan road up to the intersection with road going to Maidan Shahr which is the end of the project. The project road passes along the districts of TalaWa Barfak and Kahmard in Baghlan province at about km 67 and km 100 respectively. It also passes many villages directly along the project road. There are also other villages that are located on the opposite side of the river which will benefit from the project. The topography along the project area can be described as a combination of flat to rolling to semi mountainous from km 0 to km 80, mountainous from km 80 to km 150, semi mountainous to mountainous from km 150 to end of project. The road formation on the existing road varies from about 4.0m on mountainous areas to about 9m on flat areas. The road surface is unpaved for the whole length. The project road passes thru residential areas, agricultural and cultivated areas, alluvial fans, barren lands and near river banks. There are existing culvert structures of varying sizes which are used for irrigation and road drainage purposes, and existing retaining walls to prevent soil erosion. Irrigation ditches and canals of variable sizes are also found along the existing road. There are also 11 existing bridges of different types of superstructures which are either to be replaced or improved. There are also flooded areas where the finished road elevation is to be raised substantially or road realignment is needed to avoid flooding.

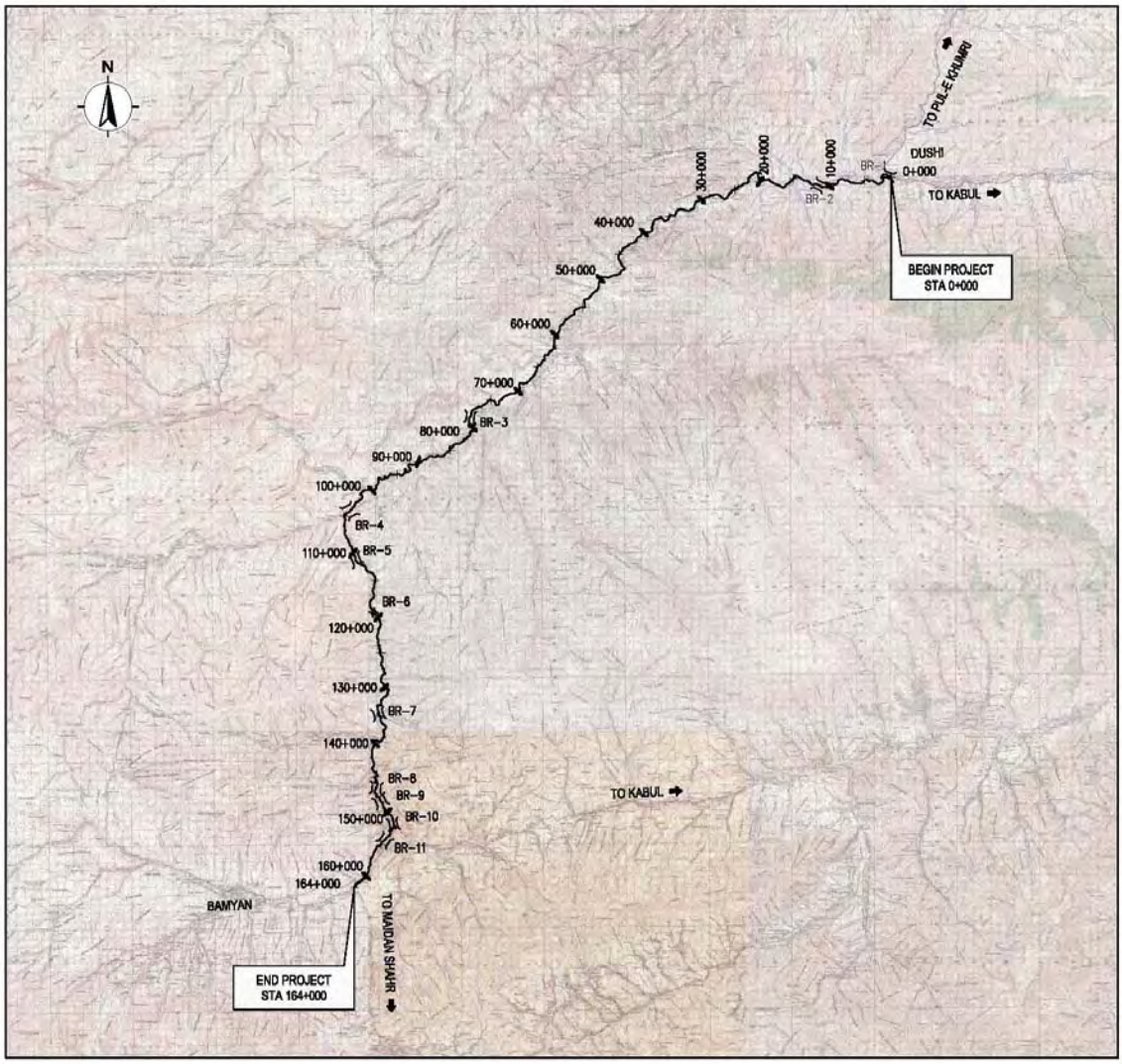
Refer to Figure 1 Location Map for location and alignment of project road.

1.3. PROJECT SCOPE

The works shall consist of the design of the horizontal and vertical alignments including superelevation and curve widening of the existing roadway from Dushi in Baghlan province, sta 0+000 to about Sta 164+000 in Bamyan province, which includes but not limited to construction of new asphalt pavement, replacement or rehabilitation of existing bridges, replacement of cross drainage culverts,

construction of new drainage culverts and roadside drains , relocation and improvement of existing irrigation canals, other ancillary works such as stone masonry retaining walls, riprap slope protection, etc., preparation of bill of quantities, hydrological and hydraulic analyses report, environmental impact assessment, geotechnical investigation such as test pits and boheholes, laboratory test and preparation of report.

Figure 1 Location Map



2. MANPOWER AND ORGANIZATION

The design organization is headed by the Task Order Manager supported by key personnels headed by the Design Manager .The organization is also supported by short term technical experts who are either in the country or based outside the country. The organizational chart is presented in Appendix A.

3. DESIGN CRITERIA

3.1. HIGHWAY DESIGN

The project road is considered to be a major road, National Highway 07, which will become an alternative route to Kabul from Dushi in Baghlan province should the Salang Tunnel be closed during winter season. The road shall also serve as a direct route to Bamyan City in Bamyan province. It is recommended to be an all weather asphalt road.

The following geometric design criteria were based on A Policy on Geometric Design of Highways and Streets, 2004 fifth edition by the American Association of Transport and Highway Officials (AASHTO) and MPW's Interim Road and Highway Standards, 18 March 2007 and adopted for the project roads.

3.1.1. Horizontal Alignment

Maximum Speed	80 kph.
Minimum Speed	40 kph
Maximum Rate of Superelevation	8.00%
Minimum Radius without Superelevation, 100 kph	3,630 m
Minimum Radius without Superelevation, 40 kph	784 m
Minimum Radius	45 m

3.1.2. Vertical Alignment

Minimum K value, Crest Curve, 80 kph	26
Minimum K value, Crest Curve, 40 kph	4
Minimum K value, Sag Curve, 80 kph	30
Minimum K value, Sag Curve, 40 kph	9
Minimum Longitudinal Gradient	0.50 %
Maximum Longitudinal Gradient	8.00 %

3.1.3. Cross Section Elements

Single Carriageway	
Road Lane Width	2 x 3.5 m
Bridge Lane Width	2 x 4.0 m
Bridge Sidewalk Width	2 x 1.0 m
Shoulder Width,	
Flat and Rolling (DBST + Gravel)	2 x 2.0 m
Built-up Area (Asphalt + Gravel)	2 x 3.5 m
Mountainous (DBST)	2 x 1.0 m

Normal crossfall	2.0%
Shoulder Slope	4.0%

Side Slope Ratio, Fill		3.0 H: 1.0 V (ht = 0 to 3.0 m)
		2.0 H: 1.0 V (ht=3.0 to 4.5 m)
		4.0 H: 1.0 V (Urban/Built-up)
	Cut	4.0 H: 1.0V (Urban, Dual Carriageway)
		1.5 H: 1.0V (H<2.0m, Common Exc.)
		1.0 H: 1.0V (H>2.0m, Common Exc.)
		1.0 H: 2.5V-3.0V (Rock Excavation)

3.1.4. Sight Distances

Stopping Sight Distance, (80kph)	130 m
Driver's Eye Height	1.08 m
Height of Object for Stopping	0.60 m

3.1.5. Widening

The design vehicle shall be based on the conducted traffic count survey by adopting the largest vehicle that travels the road frequently. Based on this traffic survey result, the design vehicle shall be a WB-12 semi trailer. Widening on curves shall be applied based on AASHTO requirements of the design vehicle.

3.2. BRIDGE DESIGN

The design of bridges and culvert structures on the project road are based on Standard Specifications for Highway Bridges (LRFD) 3rd Edition (2004) with 2005-2006 Interims adopted by American Association of State Highway and Transportation Officials (AASHTO). Additional references such as ACI, AISC ASTM, etc., specifications shall also be adopted as necessary.

3.2.1. Design Loads

3.2.1.1. Dead Loads

- Reinforced Concrete Unit Weight = 22.7 kN/m3
- Structural Steel Unit Weight = 78.5 kN/m3

3.2.1.2. Vehicle Loads: HL-93 – The greater of the following combinations

- Truck Load and Lane Load
- Tandem Load and Lane Load

3.2.1.3. Wind Load: Based on 120-mph Wind Speed

3.2.1.4. Thermal Forces: Based on Temperature Range of -15 ^{o}C to 45°C.

3.2.1.5. Stream Current Forces: Based on 5.0-meters/second flow speed

3.2.1.6. Seismic Forces: Based on Coefficient of Acceleration of 0.25 (Zone 3)

3.2.2. Materials

3.2.2.1. Structural Concrete

- Abutment, Pier, Cap Beam, Bearing Plinth, Deck and Approach Slabs: f_c' = 30MPa
- Reinforced Concrete Barrier, Box Culvert, Sidewalk: f_c' = 25MPa

3.2.2.2. Reinforcing Steel: ASTM A-615 Grade 420

3.2.2.3. Structural Steel and Connectors

- Structural Steel for Bridge Railing: ASTM A-709 Grade 250
- Structural Fasteners: ASTM A-325
- Weld Electrodes: AWS A-5.5 Grade70

4. HYDROLOGY AND HIGHWAY DRAINAGE DESIGN

The design of highway drainage facilities for this project is based on AASHTO Highway Drainage Guidelines, 4th edition (Jan 2007) and HEC-RAS, Hydraulic Reference Manual version 4 (March 2008). Hydrology Manual by Ven T. Chow was also used as reference for the analysis of hydraulic and hydrologic data.

Design of highway drainage facilities should always be preceded by accurate field surveys. An aerial survey was conducted to have an accurate view of the features of the project area. Sufficient meteorological data should also be gathered and other data such as rainfall, atmospheric temperature and monthly weather in the project areas and vicinity.

In the absence of the above stated activities, no one can be assured of the percentage of accuracy in the design result.

4.1. HYDROLOGIC STUDIES

Parameter to be used for proper and effective design of drainage components will be derived from hydrologic studies.

4.1.1. Design Discharge

The design discharge which is the peak discharge at a certain time will be estimated using three methods: Rational Formula Method, TR-55 Method and HEC HMS Method. When rainfall and stream flow records of sufficient length say more than 10 years are available then statistical frequency analysis should also be performed. Other than this the studies carried out by other institutions if available should be compared with the results obtained from the above methods.

The Rational Formula Method, which is based on the direct relationship between rainfall and runoff, will be used for watershed less than 0.8 sq. km. The following formula will be used:

Rational Formula $Q = C\ I\ A / 3.60$

where Q = rate of runoff, in cu. m/sec

C = coefficient of runoff

I = rainfall intensity, in mm/hr

A = drainage area, in sq. km

The TR-55 method will be used in estimating runoff of watersheds larger than 0.8 sq km but less than 65 sq km. It is based on storm rainfall, soil conservation services (SCS), runoff curve number (CN). Determination of CN number depends on the watershed's soil and cover conditions, which represents as hydrologic soil group, cover type, treatment, and hydrologic conditions.

$$Q = ((P-Ia)^2 / ((P-Ia) + S))$$

or $$Q = ((P-0.2S)^2)/(P+0.8S)$$

Where:

Q = runoff, in cu.m/sec

P = rainfall in mm

S = potential maximum retention after runoff begins, mm

Ia = initial obstraction, mm

Ia = 0.2S

S = (1000/CN)-10

Unit Hydrograph analysis will be applied in this study only if we can gather sufficient rainfall and flood record data for the waterways in the project areas.

HEC HMS method will be used for watersheds larger than 65 sq km. This is a method developed by the U.S. Army Corps of Engineers which is capable of accurate runoff computation even for large dendrite watersheds.

Log Pearson Type III is used to analyze the rainfall and stream flow time series. Larger catchment area will have some hydrological and meteorological stations within the catchment of a river basin. These rainfall and stream flow data can be obtained from Department of Hydrology and Meteorology. But, because of political instability in Afghanistan these data recording in the field and documentation remains poor and needs careful analysis before any application. With sufficient data, time series analysis of rainfall and stream flow provides a fair insight in the design of hydraulic structures.

4.1.2. Drainage Areas

Catchment area or drainage area is one of the basic data required in the design of surface or cross drainage structures. It is computed by demarking the drainage divides on the Topographic maps at a scale of 1:50,000 of the area. Wherever possible, the 1m contours generated from the topographic maps from the aerial photographs will also be referred. Thus drainage areas will be delineated on the maps and the surface area will be calculated by outlining watershed contributing to proposed structure site on the topographic map.

4.1.3. Rainfall Intensity

In the absence of rainfall depth recorded in minutes, Rainfall Intensity (I) will be calculated using the Log Pearson Type III frequency distribution. From this method, rainfall depth data recorded 24 hrs daily will be converted to logarithmic values. From these values, the mean value, standard deviation and

skew coefficient will be computed. Rainfall depth data were obtained from the website of NOAA due to the absence of official records from GoA.

Time of concentration (Tc) is the time required for runoff from remotest point of the drainage area to arrive at the outlet point of culvert or bridge location. The time of concentration will be computed by summing up all the travel time for conservative components of the drainage conveyance system.

$$Tc = Tt1+Tt2=Tt3+\ldots\ldots\ldots..Ttm$$

$$Tt = L/3600V$$

Where:

Tc = time of concentration, hr

Tt = travel time, hr

m = number of segments

L = flow length, m

V = average velocity, m/sec

and also by using the "Kirpich" formula

$$Tc = L^{1.15} / 51\ H^{0.385}$$

where Tc = time of concentration in minutes
L = length of the watercourse from farther source to point of interest in meters.
H = difference in elevation of the highest point and the point of interest in meters.

A minimum of 5-minutes time of concentration will be used in the design

The design return periods will be used in the design:

Type of Structure	Design Return Period
Bridge	50 years
RC Box Culvert	25 years
RC Pipe Culvert	25 years
Embankments	10 years
Roadside Ditches	10 years

4.1.4. Runoff Coefficient

The coefficient of runoff "C" is expressed as a percentage to which the peak runoff is reduced due to transitory storage. It varies according to the surface condition, slope, natures of soil and rainfall duration in the drainage area. Standard values of "C" defending on the type of soil, slope, shape and land use will be selected from the table below:

Values of "C" for use in Rational Formula

Surface	Value

Concrete or Asphalt Pavement	0.9 – 1.0
Bituminous Macadam and Double Bituminous Surface Treatment (sandy to clay)	0.7 – 0.9
Gravel Surfaced Road and Shoulder	0.3 – 0.6
Residential Area – City	0.3 – 0.6
Residential Area – Town and Village	0.2 – 0.5
Rocky Surface	0.7 – 0.9
Bare Clay Surface (faces of slips, etc.)	0.7 – 0.9
Forested Land (sandy to clay)	0.3 – 0.5
Flattish Cultivated areas (not flooded)	0.3 – 0.5
Steep or Rolling grassed areas	0.5 – 0.7
Flooded or wet paddies	0.7 – 0.8

Further recommended values of “C’ for use in Rational Formula

Land use	Topography	Soil Group			
		A	B	C	D
Forest	Flat	0.010	0.20	0.30	0.40
	Rolling	0.25	0.25	0.35	0.50
	Hilly	0.30	0.40	0.50	0.60
Pasture	Flat	0.10	0.20	0.30	0.40
	Rolling	0.16	0.26	0.36	0.55
	Hilly	0.22	0.32	0.42	0.60
Cultivated Land	Flat	0.30	0.40	0.50	0.60
	Rolling	0.40	0.50	0.60	0.70
	Hilly	0.52	0.62	0.72	0.81
Barren Land	Flat	0.34	0.44	0.54	0.64
	Rolling	0.40	0.52	0.62	0.74
	Hilly	0.55	0.60	0.75	0.83

4.1.5. Calculation of Sheet flow

Sheet flow is the flow over plane surfaces which occur usually in the headwater of streams. Manning’s n-value is an effective roughness coefficient that includes the effect of raindrop impact, drag over the plane surface, obstacle such as litter, crop ridges, rocks, erosion and transportation of sediment.

$$Tt = (0.007(nL)^{0.8})/((P2)^{0.5})(S^{0.4}))$$

Where:

Tt = travel time, hr

n = Manning's roughness coefficient

L = Flow length, m

P2 =24-hour rainfall, mm

S = Land slope, m/m

Roughness coefficient (Manning's n-value) for sheet flow

Surface Description	n-value
Smooth surfaces (concrete, asphalt, gravel, or bare soil)	0.011
Fallow (no residue)	0.050
Cultivated soils:	
Residue cover =<20%	0.060
Residue cover >20%	0.170
Grass:	
Short grass prairie	0.150
Dense grasses	0.240
Bermuda grass	0.410
Range (natural)	0.130
Woods:	
Light underbrush	0.400
Dense underbrush	0.800

4.2. HYDRAULIC DESIGN METHOD

4.2.1. Design Principles

Hydrological and Hydraulic (H&H) design has been aimed at smooth passage of design flood preventing road damage during the most usual floods (10 yr, 25 yr or 50 yr flood, depending on the type of structures and its importance) and to minimize the modifications in hydrology of the area.

To reach these objectives, following types of structures are employed in the drainage systems:

- Open channels, artificial or natural conveyances for the flow of water.
- Bridges and culverts, used when open channels cross embankments.
- Energy dissipaters, used to control the velocities of flows, especially at culvert outlets.
- Storm drainage facilities, used to collect from the carriage way and surrounding areas and direct it to the channels.

The following general principles of H&H should be adhered to for the design:

- The design of artificial channels or other facilities should consider the frequency and types of maintenance expected and make allowance for access by maintenance equipment.
- A stable channel is an important aspect for a proper functioning of highway drainage structures.
- The range of design channel discharges shall be selected and based on Geometric Design Standards, consequences of traffic interruptions, flood hazard risks, economics and local site conditions.

4.2.2. Design Criteria

The following criteria shall be followed for the design of hydraulic structures:

- All structures shall be designed hydraulically.
- Structure location shall be accurately determined in both plan and profile considering the following.
  - To avoid sediment build-up inside the structures;
  - To present minimum hazard to traffic and people;
  - To cause minimum disturbance to the prevailing system of water utilization (e.g. for irrigation) by the local people;
  - To cause a minimal disruption to the local ecosystems;
- Allowable Headwater (i.e. the depth of water that can be ponded at the upstream end of the structure) shall be limited by one or more of the following.
  - Non-damaging to upstream property;
  - Not higher than the shoulder;
  - Hw/D not greater than 1.5: generally it's taken to be 1.20;
  - No higher than the low point in the road grade.
- Structures shall be designed (with sufficient freeboard) to accommodate debris or proper provisions shall be made for debris maintenance.
- Velocities through the structures shall not either damage the highway facility or increase damages to adjacent property.
- The design shall not significantly alter the flow distribution in the flood plain. The existing flow distributions shall be maintained to the extent practicable.

Design choices shall support costs for construction, maintenance and operation, including probable repair and reconstruction and potential liability.

4.2.3. Hydraulic Consideration for Channel, Ditch and Culvert Design

Suitable design specification for the road should be adopted considering the area and the context in which the road will be constructed and maintained. AASHTO standards shall be followed.

The following values of return period will be adopted for the design;

Type of Structure	Design Period
Bridge	50 yrs

Scour analysis for bridges	100 yrs
RC Box and Pipe Culvert	25 yrs
Embankments	10 yrs
Roadside Ditches	10 yrs
For hydrological computations:	
Minimum time of concentrations	5 minutes

Hydraulic consideration for drainage culverts are as follows:

Minimum longitudinal slope for culvert	0.5%
Minimum Ditch Bed Slope	0.50%
Minimum Ditch Length	300 m
Maximum flow velocity (concrete surface)	3.0 m/s
(For velocity => 3.00m/s, energy dissipater shall be provided)	
Minimum Flow Velocity grouted riprap Surface	1.80m/s
Minimum pipe cover	600 mm
Minimum Velocity	0.8 m/s
Minimum velocity	1.8 m/s for grouted riprap surface
Minimum size of RC box culvert	800 x 800 mm
Minimum size of RC pipe culvert	1000 mm (inner diameter)
Free board opening for bridges	1000 mm
Free board roadside ditches	150 mm

The flow velocity at the outlet of the roadway drainage works should not be allowed to exceed the erosive velocity of the channel or the natural velocity of the channel, whichever is greater.

HEC-RAS software will also be used to determine water surface elevation, as well as all hydraulic characteristic of the waterway. It is a computer software program developed by the U.S. Army Corps of Engineers which is capable of analyzing hydraulic of rivers with or without bridges and channel improvement design.

4.2.4. Open Channels Design

Waterways openings and design highest water level will be obtained using open channel design formula shown below. The resulting values will be compared to the actual highest flood level experience in the area.

$$Q = A V$$

where: Q = discharge in cu.m/sec

A = area of flow in sq.m

V = mean velocity in m/sec

Mean velocity will be derived by using Manning's Equation:

$$V = (1 / n)\ R^{2/3}\ S^{1/2}$$

where: V = mean velocity in m/sec

n = roughness coefficient

R = hydraulic radius, in meters

S = hydraulic gradient or river bed slope

4.2.5. Design Consideration for Drainage Culvert

Drainage culverts will be sized using the procedure developed by the U.S. Federal Highway Administration – "FHWA Hydraulics Design Series No. 5, Hydraulic Design of Highway Culverts. The hydraulic principles and equations for this analysis are shown as follows:

Inlet Headwater Depth

$$HW = 1.2\ D$$

Outlet Headwater Depth

$$HW = H + ho - LSo$$

where:

HW = Head loss

H = head loss in meters

Ho = vertical distance from culvert outlet invert to water surface elevation in meter

L = length of culvert in meters

So = slope of the culvert

D = height or diameter of culvert in meters

4.2.6. Critical Depth Calculation

RC Box Culvert: $Dc = [(Q / B)^2 / 9.80]^{0.333}$

RC Pipe Culvert: $Dc = 0.4199\ Ke\ (Q / D^{2.5})^{0.5107}$

where:

Ke = entrance coefficient

Q = discharge in cu.m/sec

B = width of culvert in meter

D = diameter of culvert in meter

4.3. DETERMINATION OF SCOUR DEPTH

4.3.1. Local Scour and Clear Water Contraction Scour Depths

The local scour depth will be calculated by Colorado State University equations for pier scour clear water conditions.The equation is:

Ys = 2(K1) (K2) (K3) (K4) (a) ^0.65(y1) ^0.35(Fr1) ^0.43

Where:

Ys = Depth of scour,in m

K1 =Correction factor for pier nose shape

K2 =Correction factor for angle of attack of flow

K3 =Correction factor for bed condition

K4 =Correction factor for armoring of bed material

a =Pier width, in m

Y1 =Flow depth directly upstream of the pier, in m

Fr1 =Froude number directly upstream of the pier

The clear water contraction scour will be calculated using the equation in the HEC No.18 modified by Laursen:

Y2 = ((Q2^2)/ ((C (Dm) ^.667) (W2^2)), in m

Ys = Y2-Yo, in m

Dm = 1.25(D50), in m

Where:

Y2 = Total depth of water from water surface level down to scour bed level, in m

Yo = Upstream flow deth, in m

Q2 = Discharge at upstream of bridge, in cu. /sec

C = Correction factor (40 for metric)

Dm = Diameter of the smallest non- transportable particle in the bed material in the contracted section, in m

D50 = Median diameter of the bed material, in m

The scour depth to be used on the bridge site shall be the sum of the local scour and clear water contraction scour depths.

4.3.2. Scour Depth Comparison

For the purpose of comparison, calculations for scour depth shall be done also on five (5) different methods. Lacey, Shen, Larras, Neill and Breusers methods and their respective equation are shown below

Lacey: $ds = 0.473 (Q / f)^{0.333} (W / L)^{1.56}$

Shen: $ds = 0.86822 (V / W)^{1.2}$

Neill: $ds = W (1.2)(D / W)^{0.30}$

Larras: $ds = 1.42 W$

Breusers: $ds = 1.4 W$

Where

ds = scour depth in meter

Q = discharge in cu.m/sec

f = silt factor

d mm = mean diameter of bed materials in millimeter

Where there is likelihood of disturbance due to channel's configuration, Lacey has given the following factor.

River Reach	Depth of Scour factor (a)
Straight	1.25
Moderate Bend	1.50
Severe Bend	1.75
Right Angle Bend	2.00

Applying these factors, then the total scour depth (Ds) is determined by this equation:

Ds = a (ds) - depth of water in meter

The silt factor (f) values for used in computing scour depth by Lacey' regime are presented below with respect to soil classification.

Soil Classification	f	dmm	specific weight (*ton / cu.m*)
Large pebbles & coarse gravel	4.68	Max 7.50mm	2.65 - 2.68
	4.68	Min 2-5 mm	
Heavy sand	4.68	Max 2-5 mm	2.00
Coarse sand	1.56 -1.44	<2.0mm	2.65 - 2.68
Medium sand		Min 0.074-0.05mm	1.31
Standard Kennedy Silt	1.00	Max 0.074-0.05mm	2.62 - 2.68
Lower Mississippi Silt	0.357		

4.3.3. Calculation of Critical Velocity

The critical velocity upstream of the bridge will be calculated using the equation by Laursen:

Vc = Ku Y1 ^0.1667 D50 ^0.333

Where:

Vc = Critical velocity above which material of size D50 and smaller will be transported, in m/sec

Ku = Correction factor, (6.19 in SI units)

Y1 = Average depth of flow in the main channel or over bank area at the approach section, in m

D50 = Bed material particle size in a mixture of which 50% are smaller, m

4.4. SIZING OF BOULDER AND STONE FOR BRIDGE ABUTMENTS PROTECTION

In order to ensure stability of slope and prevent erosion, the size and weight of boulder to be placed at the abutment must be determined. The required diameter and weight of boulders will be computed using the U.S. Bureau of Reclamation Tractive Force Design Equation:

$$d = 1.4\ V^2 / dr\ 2\ g$$

where:

d = diameter of stone or boulder in meter

V = flow velocity in m/sec

dr = relative density of stone or boulder

g = 9.80 m/sec^2

For side slope protection against river current, the same equation will be applied but an increase of stone size is then required by introducing a correction factor (fs) due angle of side slope (A) and angle of internal friction (B) of the stones or boulders. The equation in expressed as:

$$fs = 1 / [1- (\sin A)^2 / (\sin B)^2]$$

The size of stone or boulder along the side slope of the river bank abutments is then determined using equation:

$$d = 1.4\ fs\ (V^2)/(2\ dr\ g)$$

5. PAVEMENT DESIGN

The design of the pavement structure shall be based on AASHTO's Guide for Design of Pavement Structures, 1993 edition.

The Afghanistan's MPW standard of 12 ton single axle load for paved roads will be considered indirectly in the design by adding overload conditions in the determination of ESALs. The ESAL (Equivalent Single Axle Load) is defined by analyzing all axles type loads, that there is overload conditions. There is no recognized available method for pavement structure to be designed for a specific load.

The pavement will be designed based on a 5percent annual traffic growth and a ten year lifespan.

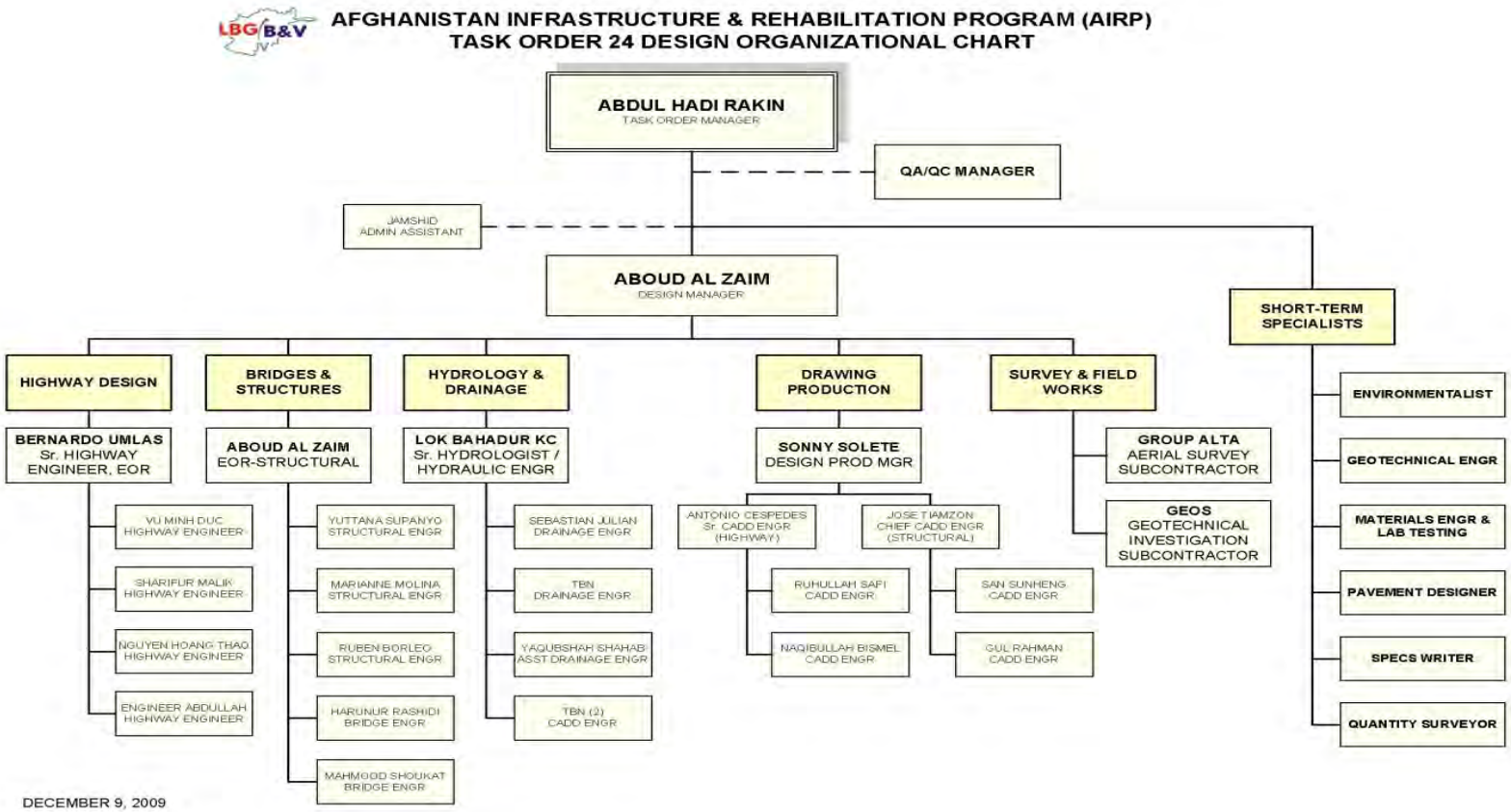
6. ROAD RIGHT OF WAY (R O W)

Road right of way (ROW) width of 15 m on both sides from designed road centerline shall be adopted for this project. It is based on major roads requirement of the MPW's Interim Road and Highway Standards, 18 March 2007. Right of way acquisition shall be the responsibility of IRoA.

7. ENVIRONMENT IMPACT ASSESSMENT

A separate Environmental Impact Assessment (EIA) report shall be prepared and submitted to USAID for their review and approval.

8. APPENDICES


AFGHANISTAN INFRASTRUCTURE & REHABILITATION PROGRAM (AIRP)
TASK ORDER 24 DESIGN ORGANIZATIONAL CHART
ABDUL HADI RAKIN
TASK ORDER MANAGER
QA/QC MANAGER
JAMSHID
ADMIN ASSISTANT
ABOUD AL ZAIM
DESIGN MANAGER
SHORT-TERM SPECIALISTS
HIGHWAY DESIGN
BRIDGES & STRUCTURES
HYDROLOGY & DRAINAGE
DRAWING PRODUCTION
SURVEY & FIELD WORKS
BERNARDO UMLAS
Sr. HIGHWAY ENGINEER, EOR
ABOUD AL ZAIM
EOR-STRUCTURAL
LOK BAHADUR KC
Sr. HYDROLOGIST / HYDRAULIC ENGR
SONNY SOLETE
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GROUP ALTA
AERIAL SURVEY SUBCONTRACTOR
GEOS
GEOTECHNICAL INVESTIGATION SUBCONTRACTOR
ENVIRONMENTALIST
GEOTECHNICAL ENGR
MATERIALS ENGR & LAB TESTING
PAVEMENT DESIGNER
SPECS WRITER
QUANTITY SURVEYOR
VU MINH DUC
HIGHWAY ENGINEER
SHARIFUR MALIK
HIGHWAY ENGINEER
NGUYEN HOANG THAO
HIGHWAY ENGINEER
ENGINEER ABDULLAH
HIGHWAY ENGINEER
YUTTANA SUPANYO
STRUCTURAL ENGR
MARIANNE MOLINA
STRUCTURAL ENGR
RUBEN BORLEO
STRUCTURAL ENGR
HARUNUR RASHIDI
BRIDGE ENGR
MAHMOOD SHOUKAT
BRIDGE ENGR
SEBASTIAN JULIAN
DRAINAGE ENGR
TBN
DRAINAGE ENGR
YAQUBSHAH SHAHAB
ASST DRAINAGE ENGR
TBN (2)
CADD ENGR
ANTONIO CESPEDES
Sr. CADD ENGR (HIGHWAY)
JOSE TIAMZON
CHIEF CADD ENGR (STRUCTURAL)
RUHULLAH SAFI
CADD ENGR
NAQIBULLAH BISMEL
CADD ENGR
SAN SUNHENG
CADD ENGR
GUL RAHMAN
CADD ENGR
DECEMBER 9, 2009

APPENDIX "A"

APPENDIX 2

TO-24 Bamyan Dushi Road Design

Security Incident Report Summary

AIRP Summary Security Incident Report (SIR) Information

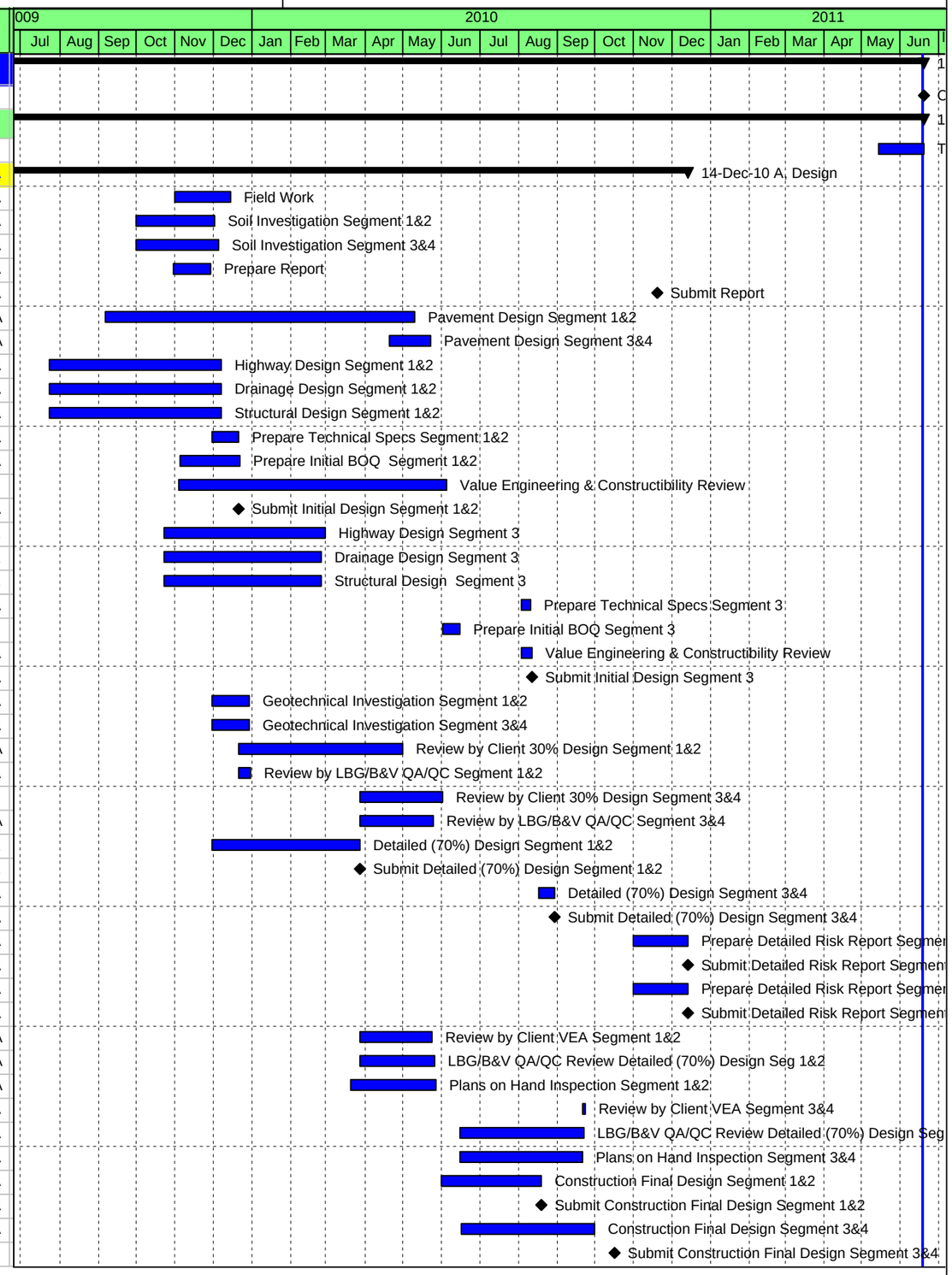
SIR	Date		Location		Name of Project		Contractor Involved		Specific Incident/ Accident details																	
										Security Incident						Accident				Classification of Incident					
#	Day	Time	Province	District	Task order	Sector	Subcontractor	Security Provider	Response	KIA		WIA		MIA		Deceased		Injured		Ambush	IED/BBIED/ VBIED	Standoff attack	Vehicle/Heli accident	Industrial accident/Incident	UXO/Land-mines
										Ex	LN	Ex	LN	Ex	LN	Ex	LN	Ex	LN						
a	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*i*	*j*	*k*	*L*	*m*	*n*	*o*	*p*	*q*	*r*	*s*	*t*	*u*	*v*	*w*	*x*	*y*	*z*
00464	13-Jan-10	13:00	Baghlan	Tala wa Barfak	TO24&1	Roads	SSSI	SSSI	Air marshal failed to exercise control of pax who walked under helicopter tail rotor - no injuries															1	
00496	27-Feb-10	6:30	Baghlan	Doshi	TO24&1	Roads	Generator supply	None	It is reported that between the hours of 23:00 and 06:00 on 26-27 Feb 10, fifteen armed suspects, entered the LBG/B&V Camp Tala on the Doshi –Bamyam Road and after assaulting the four LBG/B&V JV TO24 Subcontractors, they vandalized the camp, set fire to equipment and stole other equipment. There were NO LBG/B&V clients or employees at the camp of the time of the incident.				4								1			
00523	26-Mar-10	8:30	Baghlan	Doshi	TO24	Roads	Hart	Hart	It is reported that the local Doshi police have defused one or two IEDs, ivo KM 3/ KM 3.8 on the LBG/B&V TO8 Doshi – Bamyan road. The information was reported to the Police by a local teacher who saw wires coming from the device. The information was then passed by the police to LN Engineers who were staying in Doshi. They were advised by police not to use the road for a couple of days. No LBG/B&V JV clients, personnel, sub contractors or equipment were involved in this second tier incident.											1				
00558	29-Apr-10	9:30	Baglan	Tala wa Barfak	TO24	Roads	Hart	ANP	It is reported by the LBG/B&V JV TO24 Security Sub contractor, Hart Security, that on 29 April 2010 at 09:30 that a Landmine was discovered, presumably washes up by storm waters, ivo km 75 near the village of Tala on the TO24 Doshi – Bamyan road. The type of landmine was an Italian type. No LBG/B&V JV TO24 Clients, Personnel or subcontractors were involved in this incident															1
00562	2-May-10	20:00	Baghlan	Tala wa Barfak	TO24	Roads	Hart	ANP	It is reported that a group of insurgents, between 40 – 60 in number, attempted to overrun the ANP station in the Tala Village, Doshi District, Baghlan Province, during the night of 2 May 2010 armed with AK, PKMs & RPGs. It was reported to TO24 Hart security from Camp Tala that at least alleged insurgents were observed passing the LBG/B&V JV TO24 Tala Camp indicating a possible threat on the camp. In terms of Safety, it was decided to evacuate all LBG/B&V TO24/26 employees from the camp until the situation is restored. No LBG/B&V JV TO24/26 Clients, personnel subcontractors or equipment was damaged as a result of this second tier incident.											1				
00588	28-May-10	9:00	Baghlan	Tala wa Barfak	TO26	Roads	LBG/B&V	Hart	It is reported from TO26 that at 09:00 on Friday 28 May 2010 an LBG/B&V JV engineer, Mr Latif reported seeing an UXO ivo km 68 on Doshi – Bamyan Road. The ANP Tala office was informed and the UXO was removed by the ANP. No LBG/B&V TO26 Clients, personnel or subcontractors sustained injuries or damage as a result of the incident.															1
00600	2-Jun-10	16:00	Baghlan	Doshi	TO26	Roads	Hart	Hart	On 02 Jun 10 at 16:00 four Taliban came to the first boom gate at Camp Tala (TO26) asking to see the camp officer. One of the Taliban came unarmed to the gate and handed a written note demanding the hand over of Zulfiqan (a Hart driver) because according to the Taliban, Zulfiqan shot twice at them a couple of days ago. The note also stated "OTHERWISE IT'S NOT GOOD FOR US". The guard who received the letter said they have no interest in the camp or the people of the camp; it's a private matter between them and Sulfiqan. The guard commander on duty said he recognized all of the Taliban. They are all from Tala and Barfack and also told him they have no "issue" with the camp or its people; but just want Sulfiqan. They were then informed that Sulfiqan was not at the camp. Although heavily armed at no time did they show any signs of attacking. After about 45 minutes all the Talliban left peacefully.															
00628	3-Jul-10	10:40	Baghlan	Tala wa Barfak	TO26	Roads	Hart	HART	It is reported by the LBG/B&V JV TO26 Security Subcontractor Hart Security team leader that while the team was returning from a mission on 3 July 10 at approximately 10:40, passing through the village of Tala, ivo the ANP station, a man suddenly picked up a large rock and threw the rock at the LBG/B&V JV TO26 eight vehicle, striking the LBG/B&V JV Armored B6 Toyota Land cruiser's windscreen. As a result this incident, the windscreen is severely damaged and thus compromises the safety this B6 Armored vehicle. No LBG/B&V JV clients, personnel or subcontractors sustained injuries as a result of this incident.															
00633	5-Jul-10	16:20	Baglan	km 84,	TO26	Roads	Hart	HART	It is reported by the LBG/B&V BV TO26 Security Subcontractor Hart Security Team Leader that on 5 July 2010 at approximately 16:20 that an IED detonated, striking a TO26 vehicle road movement ivo km 84,7 on the Doshi – Bamyam Road. As a result of the IED, three members, (1x LBG/B&V JV LN driver, one Hart PSD expat and one hart LN interpreter sustained injuries) while the vehicle was extensively damaged and could not be recovered.			1	2					1		1				
00647	13-Jul-10	16:00	Bamyan	Bamyan	TO26	Roads	Hart	LBG/B&V	It is reported by the LBG/B&V JV Security Subcontractor Hart Security Coordinator, that on 13 July 2010 at approximately 14:00 whilst returning from the joint Hart Security LBG/BV AA mission from Km 123 on the Dowshi-Bamyan road, one of the LBG/B&V JV B6 vehcles experienced a tire blowout and subsequently crashed. An LBG/B&V Driver and an IRP client sustained injuries during the accident and were treated by the TO26 PSD medic on hand. The vehicle was badly damaged and had to be recovered with the hire of a Crane and Truck.								1	1				1		
00677	7-Aug-10	19:15	Baghlan	Camp Tala	TO24/26	Roads	Hart	Hart	It is reported by the LBG/B&V JV TO24/26 Security Subcontractor Hart Security, that on 7 August 2010 at approximately 18:10hrs, Mr Mustafa Hakimi, a Hart local national employee, hired as an Interpreter, complained of chest pain. He was taken to a nearby doctor who was not able to treat the member. On his return to Camp Tala the member collapsed and after the TO24/26 Hart Medics had applied CPR and the defibrillator life support computer system, the member died at 19:15. No LBG/B&V JV TO24/26 Clients, Personnel or Sub-contractors, except the aforementioned deceased, were involved in the incident.							1							1	
00705	9-Sep-10	16:45	Baghlan	Tala wa Barfak	TO26	Security	Hart	Hart	It is reported by LBG/B&V JV TO 24/26 Security Subcontractor Hart Security, that on 09 Sep 10 at approximately 16:45, Ghulam Rasul, a logistics officer for the Aga Khan Network, entered the compound and complained that he was shot at by one of Camp Tala (off duty) guard, Abdul Majid in town. The reason stated for the attack was due to his previous association with the Taliban and his brother's current association. His brother's name is Mohammad Rassul (known confirmed Taliban). No LBG/B&V JV clients or personnel were involved.															
*00814	12-Jan-11	14:20	Badaghshan	Km 68	TO26	Security	Hart	Hart	It is reported by LBG/B&V JV TO 24/26 Security Subcontractor Hart Security, that on 12 Jan 11 at approximately 14:20 there was as AGE complex attack on PRT PSD team engaged enroute after leaving CT72. The LBG client team who was coincidentally enroute back to CT72 and therefore within immediate contact area travelling West. The PSD team travelling East had contact at KM 68.3, being overlooked by high ground to the South. No LBG/B&V JV personnel, clients, sub-contractors were injured during the incident.											1				
										0	0	1	6	0	0	0	1	1	2	0	2	3	1	2	2
										KIA		WIA		MIA		Deceased		Injured		Ambush	IED/BBIED/ VBIED	Standoff attack	Vehicle/Heli accident	Industrial accident/Incident	UXO/Land-mines

APPENDIX 3

TO-24 Bamyan Dushi Road Design

Project Schedule

Activity ID	Activity Name	Original Duration	Remaining Duration	Schedule % Complete	Start	Finish
Bamyan-Dushi Road Design and WM		735	0	0%	15-Jun-09 A	19-Jun-11 A
PR190	COMPLETE TASK ORDER 24	0	0	0%		19-Jun-11 A
Bamyan-Dushi Road Design (Aug - 09)		735	0	0%	15-Jun-09 A	19-Jun-11 A
PR140	TASK ORDER 24 CLOSE OUT	36	0	97.22%	15-May-11 A	19-Jun-11 A
Design		694	0	0%	15-Jun-09 A	14-Dec-10 A
EN1000	Field Work	45	0	100%	31-Oct-09 A	15-Dec-09 A
EN1020	Soil Investigation Segment 1&2	15	0	100%	01-Oct-09 A	02-Dec-09 A
EN1025	Soil Investigation Segment 3&4	15	0	100%	01-Oct-09 A	05-Dec-09 A
EN1035	Prepare Report	30	0	100%	30-Oct-09 A	29-Nov-09 A
EN1040	Submit Report	0	0	100%		20-Nov-10 A
EN1065	Pavement Design Segment 1&2	45	0	100%	06-Sep-09 A	11-May-10 A
EN1070	Pavement Design Segment 3&4	45	0	100%	20-Apr-10 A	23-May-10 A
EN1075	Highway Design Segment 1&2	150	0	100%	23-Jul-09 A	07-Dec-09 A
EN1080	Drainage Design Segment 1&2	150	0	100%	23-Jul-09 A	07-Dec-09 A
EN1085	Structural Design Segment 1&2	150	0	100%	23-Jul-09 A	07-Dec-09 A
EN1090	Prepare Technical Specs Segment 1&2	45	0	100%	30-Nov-09 A	22-Dec-09 A
EN1095	Prepare Initial BOQ Segment 1&2	45	0	100%	04-Nov-09 A	22-Dec-09 A
EN1096	Value Engineering & Constructibility Review	120	0	100%	04-Nov-09 A	04-Jun-10 A
EN1100	Submit Initial Design Segment 1&2	0	0	100%		22-Dec-09 A
EN1105	Highway Design Segment 3	156	0	100%	23-Oct-09 A	28-Feb-10 A
EN1110	Drainage Design Segment 3	156	0	100%	23-Oct-09 A	25-Feb-10 A
EN1115	Structural Design Segment 3	156	0	100%	23-Oct-09 A	25-Feb-10 A
EN1120	Prepare Technical Specs Segment 3	45	0	100%	03-Aug-10 A	11-Aug-10 A
EN1125	Prepare Initial BOQ Segment 3	45	0	100%	01-Jun-10 A	15-Jun-10 A
EN1126	Value Engineering & Constructibility Review	101	0	100%	03-Aug-10 A	11-Aug-10 A
EN1130	Submit Initial Design Segment 3	0	0	100%		11-Aug-10 A
EN1135	Geotechnical Investigation Segment 1&2	45	0	100%	30-Nov-09 A	30-Dec-09 A
EN1140	Geotechnical Investigation Segment 3&4	45	0	100%	30-Nov-09 A	30-Dec-09 A
EN1145	Review by Client 30% Design Segment 1&2	45	0	100%	22-Dec-09 A	01-May-10 A
EN1150	Review by LBG/B&V QA/QC Segment 1&2	45	0	100%	22-Dec-09 A	31-Dec-09 A
EN1155	Review by Client 30% Design Segment 3&4	45	0	100%	28-Mar-10 A	01-Jun-10 A
EN1160	Review by LBG/B&V QA/QC Segment 3&4	45	0	100%	28-Mar-10 A	25-May-10 A
EN1165	Detailed (70%) Design Segment 1&2	90	0	100%	30-Nov-09 A	28-Mar-10 A
EN1170	Submit Detailed (70%) Design Segment 1&2	0	0	100%		28-Mar-10 A
EN1175	Detailed (70%) Design Segment 3&4	59	0	100%	17-Aug-10 A	30-Aug-10 A
EN1180	Submit Detailed (70%) Design Segment 3&4	0	0	100%		30-Aug-10 A
EN1185	Prepare Detailed Risk Report Segment 1&2	30	0	100%	01-Nov-10 A	14-Dec-10 A
EN1190	Submit Detailed Risk Report Segment 1&2	0	0	100%		14-Dec-10 A
EN1195	Prepare Detailed Risk Report Segment 3&4	30	0	100%	01-Nov-10 A	14-Dec-10 A
EN1200	Submit Detailed Risk Report Segment 3&4	0	0	100%		14-Dec-10 A
EN1205	Review by Client VEA Segment 1&2	45	0	100%	28-Mar-10 A	24-May-10 A
EN1210	LBG/B&V QA/QC Review Detailed (70%) Design Seg 1&2	45	0	100%	28-Mar-10 A	26-May-10 A
EN1215	Plans on Hand Inspection Segment 1&2	45	0	100%	21-Mar-10 A	27-May-10 A
EN1220	Review by Client VEA Segment 3&4	31	0	100%	21-Sep-10 A	23-Sep-10 A
EN1225	LBG/B&V QA/QC Review Detailed (70%) Design Seg 3&4	45	0	100%	15-Jun-10 A	22-Sep-10 A
EN1230	Plans on Hand Inspection Segment 3&4	45	0	100%	15-Jun-10 A	21-Sep-10 A
EN1235	Construction Final Design Segment 1&2	45	0	100%	31-May-10 A	19-Aug-10 A
EN1240	Submit Construction Final Design Segment 1&2	0	0	100%		19-Aug-10 A
EN1245	Construction Final Design Segment 3&4	45	0	100%	16-Jun-10 A	30-Sep-10 A
EN1250	Submit Construction Final Design Segment 3&4	0	0	100%		17-Oct-10 A



Actual Work | Critical Remaining Work | Summary
Remaining Work | Milestone

TASK filter: All Activities

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Activity ID	Activity Name	Original Duration	Remaining Duration	Schedule % Complete	Start	Finish
EN1305	Highway Design Segment 4	156	0	100%	23-Oct-09 A	03-Aug-10 A
EN1310	Drainage Design Segment 4	156	0	100%	23-Oct-09 A	03-Aug-10 A
EN1315	Structural Design Segment 4	156	0	100%	23-Oct-09 A	03-Aug-10 A
EN1320	Prepare Technical Specs Segment 4	45	0	100%	03-Aug-10 A	11-Aug-10 A
EN1325	Prepare Initial BOQ Segment 4	45	0	100%	18-May-10 A	26-Aug-10 A
EN1330	Submit Initial Design Segment 4	0	0	100%		11-Aug-10 A
PR100	Notice to Proceed	0	0	100%	15-Jun-09 A	
PR105	Submit Security Plan	0	0	100%	22-Jun-09 A	
PR110	Submit Demining Plan	0	0	100%	22-Jun-09 A	
PR115	Submit QC Plan	0	0	100%	22-Jun-09 A	
PR125	Reconnaisance Survey	45	0	100%	15-Jun-09 A	22-Jul-09 A
PR130	Work Plan	0	0	100%	22-Jun-09 A	
PR135	Traffic Count Survey	30	0	100%	31-Jul-09 A	30-Aug-09 A
PR145	Submit QA Plan	0	0	100%	22-Jun-09 A	
PR160	SUBMISSION OF 30% DESIGN 195 DAYS + NTP	0	0	100%		31-Jan-10 A
PR170	SUBMISSION OF 70% DESIGN 285 DAYS + NTP	0	0	100%		11-Aug-10 A
PR180	SUBMISSION OF FINAL DESIGN 375 DAYS + NTP	0	0	100%		19-Aug-10 A
PR200	SUBMISSION OF 30% DESIGN 285 DAYS + NTP	0	0	100%		08-Aug-10 A
PR210	SUBMISSION OF 70% DESIGN 375 DAYS + NTP	0	0	100%		18-Aug-10 A
PR220	SUBMISSION OF FINAL DESIGN 465 DAYS + NTP	0	0	100%		17-Oct-10 A
Procurement		576	0	0%	02-Oct-09 A	20-Oct-10 A
50	COMPLETE LETTER OF INTEREST & SCOPE PKG	5	0	100%	02-Oct-09 A	06-Oct-09 A
60	MAIL PKACAGE TO ALL POTENTIAL BIDDERS	1	0	100%	07-Oct-09 A	07-Oct-09 A
70	BIDDERS RESPONSE DUE	15	0	100%	08-Oct-09 A	29-Oct-09 A
80	REVIEW, EVALUATION, INTERVIEW BIDDERS	7	0	100%	30-Oct-09 A	06-Nov-09 A
90	USAID CONSENT	1	0	100%	06-Nov-09 A	07-Nov-09 A
EN1255	Advertise Express of Interest Segment 1&2	5	0	100%	18-May-10 A	26-May-10 A
EN1260	Conduct Pre-Qualification Workshop Segment 1&2	1	0	100%	05-Jun-10 A	05-Jun-10 A
EN1265	Evaluate Bidder Qualifications Segment 1&2	30	0	100%	26-May-10 A	23-Jun-10 A
EN1270	Submit Recommendation to COTR Segment 1&2	0	0	100%	23-Jun-10 A	
EN1275	Conduct Interview w/ Rejected Applicants Seg 1&2	30	0	100%	06-Jun-10 A	18-Aug-10 A
EN1280	Advertise Express of Interest Segment 3&4	45	0	100%	18-May-10 A	26-May-10 A
EN1285	Conduct Pre-Qualification Workshop Segment 3&4	0	0	100%	23-Jun-10 A	
EN1290	Evaluate Bidder Qualifications Segment 3&4	30	0	100%	23-Jun-10 A	25-Jun-10 A
EN1295	Submit Recommendation to COTR Segment 3&4	0	0	100%	25-Jun-10 A	
EN1300	Conduct Interview w/ Rejected Applicants Seg 3&4	30	0	100%	09-Aug-10 A	25-Aug-10 A
PR300	SUBMIT A LIST OF PREQUALIFIED BIDDERS SEG 1 & 2	31	0	100%	13-Apr-10 A	23-Jun-10 A
PR310	SUBMIT LIST OF PREQUALIFIED BIDDERS FOR SEG 3,4	31	0	100%	30-Jun-10 A	23-Jul-10 A
PR320	SUBMIT COST ESTIMATE 70% DESIGN + 14 DAYS SEG1,2	0	0	100%		22-Sep-10 A
PR330	SUBMIT COST ESTIMATE SEG 3,4 -70% DESIGN +14 DAY	0	0	100%		17-Oct-10 A
PR340	BASED ON VEA OBTAIN COST ESTIMATE FROM A&E	31	0	100%	02-Oct-10 A	20-Oct-10 A
PR370	NEEDS ASSESSMENT OUTREACH,CAPACITY BUILDING	1	0	100%	01-Nov-09 A	12-Dec-09 A
Demining		120	0	0%	31-Jul-09 A	26-Oct-09 A
PR150	Procure Demining Subcontractor	30	0	100%	31-Jul-09 A	30-Aug-09 A
PR151	Demining	90	0	100%	30-Aug-09 A	26-Oct-09 A
Mod #1 - Winter Maintenance 2009/2010		379	0	0%	16-Sep-09 A	15-Sep-10 A
10	RECEIVED REQUEST TO#24 MODIFICATION FROM USAID	0	0	100%	16-Sep-09 A	
20	LBG/B&V PREPARE AND SUBMIT RESPONSE	9	0	100%	16-Sep-09 A	24-Sep-09 A
30	USAID REVIEW AND APPROVES PROPOSAL	6	0	100%	25-Sep-09 A	30-Sep-09 A
40	USAID ISSUES NTP TO LBG/BV	0	0	100%		01-Oct-09 A
100	ISSUE NTP TO SUCCEFUL BIDDER/S	2	0	100%	07-Nov-09 A	09-Nov-09 A

Actual Work | Critical Remaining Work | Summary
Remaining Work | Milestone

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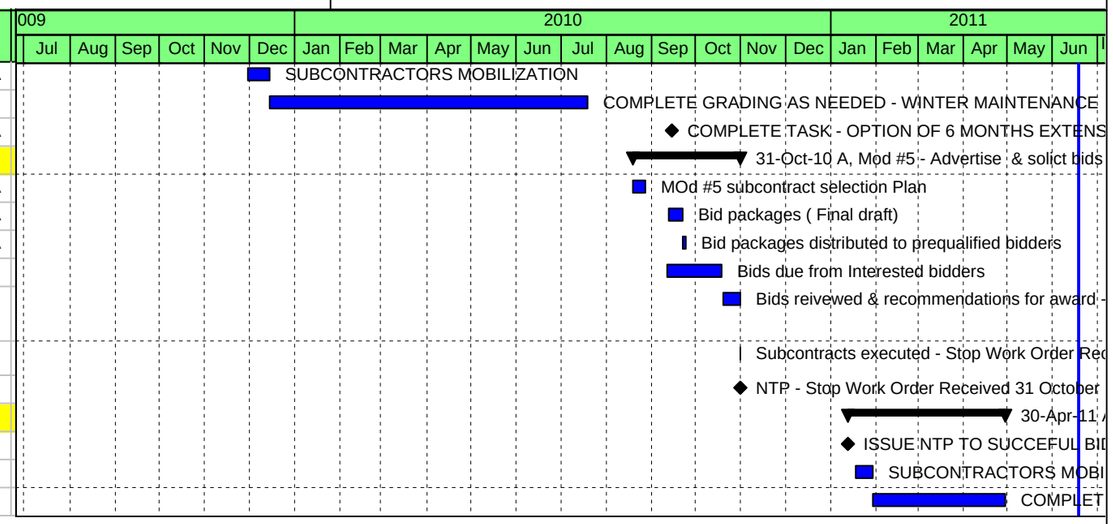
Activity ID	Activity Name	Original Duration	Remaining Duration	Schedule % Complete	Start	Finish
110	SUBCONTRACTORS MOBILIZATION	15	0	100%	30-Nov-09 A	14-Dec-09 A
120	COMPLETE GRADING AS NEEDED - WINTER MAINTENANCE	158	0	100%	15-Dec-09 A	20-Jul-10 A
130	COMPLETE TASK - OPTION OF 6 MONTHS EXTENSION	0	0	100%		15-Sep-10 A
Mod #5 - Advertise & solict bids for the 1st phase of construction		225	0	0%	19-Aug-10 A	31-Oct-10 A
140	MOd #5 subcontract selection Plan	7	0	100%	19-Aug-10 A	28-Aug-10 A
150	Bid packages (Final draft)	7	0	100%	13-Sep-10 A	22-Sep-10 A
160	Bid packages distributed to prequalified bidders	3	0	100%	22-Sep-10 A	24-Sep-10 A
170	Bids due from Interested bidders	35	0	100%	12-Sep-10 A	19-Oct-10 A
180	Bids reivewed & recommendations for award - Stop Work Order Received 31 October 2010	0	0	100%	20-Oct-10 A	31-Oct-10 A
190	Subcontracts executed - Stop Work Order Received 31 October 2...	0	0	100%	31-Oct-10 A	31-Oct-10 A
200	NTP - Stop Work Order Received 31 October 2010	0	0	100%		31-Oct-10 A
Mod #6 - Winter Maintenance 2010/2011		197	0	0%	13-Jan-11 A	30-Apr-11 A
220	ISSUE NTP TO SUCCEFUL BIDDER/S	0	0	100%	13-Jan-11 A	
230	SUBCONTRACTORS MOBILIZATION	15	0	100%	18-Jan-11 A	30-Jan-11 A
240	COMPLETE GRADING AND SNOW REMOVAL	158	0	100%	30-Jan-11 A	30-Apr-11 A



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Remaining Work | Milestone

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