



# USAID | WEST BANK/GAZA

FROM THE AMERICAN PEOPLE

## FINAL REPORT

CONTRACT NO. 294-I-00-12-00005

MULTIPLE ROADS PROJECT IN THE SOUTH

August 2014 AID-294-TO-13-00004



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## TABLE OF CONTENTS

	<b>TABLE OF CONTENTS</b>	1
	<b>LIST OF FIGURES</b>	2-5
	<b>LIST OF TABLES</b>	6
	<b>ABBREVIATIONS</b>	7
	<b>EXECUTIVE SUMMARY</b>	8
<b>CHAPTER 1</b>	<b>BACKGROUND</b>	9-47
<b>CHAPTER 2</b>	<b>WORK PROGRESS</b>	48-66
<b>CHAPTER 3</b>	<b>OBSTRUCTIONS AND ACTION TAKEN TO GET BACK ON TRACK</b>	67-81
<b>CHAPTER 4</b>	<b>SAFETY PROGRAM AND MEASURES</b>	82-88
<b>CHAPTER 5</b>	<b>TRAFFIC MANAGEMENT</b>	89-97
<b>CHAPTER 6</b>	<b>QUALITY CONTROL PROGRAM</b>	98-105
<b>CHAPTER 7</b>	<b>SITE FACILITIES</b>	106-108
<b>CHAPTER 8</b>	<b>VARIATION ORDERS AND PAYMENTS</b>	109-116
<b>CHAPTER 9</b>	<b>JOP OPPORTUNITIES</b>	117-118
<b>CHAPTER 10</b>	<b>SUBMITTALS</b>	119-120
<b>CHAPTER 11</b>	<b>COMMUNICATION, COORDINATION, AND SITE VISITOR</b>	121-126
<b>CHAPTER 12</b>	<b>ACHIEVED GOALS AND LESSONS</b>	127-129
	<b>APPENDIX A – COMMUNICATION, COORDINATION, &amp; SITE VISITORS LOG</b>	131-179
	<b>APPENDIX B – SUBMITTALS AND RFI's LOG</b>	180-199
	<b>APPENDIX C – EQUIPMENT MATERIAL LOG</b>	200-308
	<b>APPENDIX D – TESTING LOG SHEET</b>	309-359
	<b>APPENDIX E – ORGANIZATION CHART</b>	360-361
	<b>APPENDIX F – PAYMENTS LOG</b>	362-363
	<b>APPENDIX G – INSPECTION REQUEST LOG</b>	364-410
	<b>APPENDIX H – TIME SCHEDULE</b>	411-441
	<b>APPENDIX I – SITE MEMOS LOG</b>	442-448
	<b>APPENDIX J – FINAL ACCEPTANCE CERTIFICATE AND SITE HANDOVER</b>	449-543
	<b>APPENDIX K – TEMPORARY JOB DAYS LOG</b>	544-660

## LIST OF FIGURES

Figure Name	No.
Figure 1.1: Task Order 04 road Projects location in the WB.	11
Figure 1.2: Project 01- Wadi Al Jeer–Al Sawahira Al Sharqiya Road (Segment A) location in the WB.	12
Figure 1.3: Project 01- Wadi Al Jeer–Al Sawahira Al Sharqiya Road (Segment A) location in the WB.	13
Figure 1.4: Project 01- Wadi Al Jeer–Al Sawahira Al Sharqiya Road (Segment A) original scope of work.	14
Figure 1.5: Project 02- Wadi Al Jeer–Al Sawahira Al Sharqiya Road (Segment B) location in the WB.	15
Figure 1.6: Project 02- Wadi Al Jeer–Al Sawahira Al Sharqiya Road (Segment B) location in the WB.	16
Figure 1.7: Project 02- Wadi Al Jeer–Al Sawahira Al Sharqiya Road (Segment B) original scope of work.	17
Figure 1.8: Project 03- Al Sawahira Al Sharqiya-Sheikh Sa'ed Road (Segment C) location in the WB.	18
Figure 1.9: Project 03- Al Sawahira Al Sharqiya-Sheikh Sa'ed Road (Segment C) location in the WB.	19
Figure 1.10: Project 03- Al Sawahira Al Sharqiya-Sheikh Sa'ed Road (Segment C) original scope of work.	20
Figure 1.11: Project 04- WNV- Wadi Al Nar Road (Seg. V) location in the WB.	21
Figure 1.12: Project 04- WNV- Wadi Al Nar Road (Seg. V) location in the WB.	22
Figure 1.13: Project 04- WNV- Wadi Al Nar Road (Seg. V) Original scope of work.	23
Figure 1.14: Project 05- QAL- Qalandiya-Jabaa Road Safety Enhancement Location in the WB.	24
Figure 1.15: Project 05- QAL- Qalandiya-Jabaa Road Safety Enhancement location in the West Bank and scope.	25
Figure 1.16: Project 05- QAL- Qalandiya-Jabaa Road Safety Enhancement work progress.	26
Figure 1.17: Project 06- THR- Al Thirwa Schools Road and Roads Retaining Structures location in the WB.	27
Figure 1.18: Project 06- THR- Al Thirwa Schools Road and Roads Retaining Structures location in the WB and scope.	28
Figure 1.19: Project 07- HEB- Milling and Overlay of Hebron Internal Roads Location in the WB.	29
Figure 1.20: Project 07- HEB- Milling and Overlay of Hebron Internal Roads Location in the WB and scope.	30
Figure 1.21: Project 07- HEB- Beit Enoon Roundabout Location.	31
Figure 1.22: Project 01- WJA- Typical cross section from St. A0+360 to St. A0+420.	35
Figure 1.23: Project 01- WJA- Typical cross section from St. A2+100 to St. A2+200.	35
Figure 1.24: Project 02- WJB- Typical cross section from St. 0+003 to St. 0+835.	35
Figure 1.25: Project 02- WJB- Typical cross section from St. 0+835 to St. 0+972.	36
Figure 1.26: Project 03- SSC- Typical cross section at St. 0+570.	36
Figure 1.27: Project 03- SSC- Typical cross section at St. 0+920.41.	36
Figure 1.28: Project 03- SSC- Typical cross section at St. 0+970.41.	37
Figure 1.29: Project 04- WNV- Typical cross section from St. 0+138 to St. 0+313 and from St. 0+420 to St. 0+570.	37
Figure 1.30: Project 04- WNV- Typical cross section from St. 0+030 to St. 0+161, from St. 0+293 to St. 0+454 and from St. 0+545 to St. 0+990.	37
Figure 1.31: Project 05- QAL- Typical cross section from St. 0+818 to St. 2+192.	38
Figure 1.32: Project 06- THR- Segment A- Typical cross section from St. 0+000 to St. 0+657.	38
Figure 1.33: Project 06- THR- Segment B- Typical cross section at St. 0+035.07.	38
Figure 1.34: Project 07- HEB- Beit Enoon- Segment A- Typical cross section from St. A0+136 to St. A0+159.5.	39
Figure 1.35: Project 07- HEB- Beit Enoon- Segment A- Typical cross section from St. A0+213 to St. A0+223.	39
Figure 1.36: Project 07- HEB- Beit Enoon- Segment B- Typical cross section from St. B0+124.5 to St. B0+141	39
Figure 1.37: Before- Students leaving school and crossing a high speed highway unsafely at Beit Enon - Hebron	44
Figure 1.38: After- Beit Enoon Roundabout enhanced safety and provided safe access (road crossings and median) for the school students.	44
Figure 1.39: copies of projects 01 and 02 flyer were handed to Al Sawahreh local council.	45
Figure 1.40: Meeting with public transportation drivers at Abu Dees Parking Area.	45
Figure 1.41: Meetings with local women at al Sawahreh and Al ObeidyeH towns.	46
Figure 1.42: Safety Toolbox talk at Halhul Girls School.	46
Figure 1.43: Ramadan Iftar for orphans from Hebron charitable organization.	46
Figure 1.44: Ramadan Iftar for orphans from Hebron charitable organization.	46
Figure 1.45: APCO/ArCon participation in an “Employment day” event held by the International Youth Foundation (IYF) - Hebron.	47
Figure 1.46: APCO/ArCon participation in an “Employment day” event held by the International Youth Foundation (IYF) - Hebron.	47
Figure 1.47: Safety Toolbox talk at Omar Ibn Al Aziz Girls School near Beit Enoon roundabout.	47
Figure 1.48: Safety Toolbox talk at Omar Ibn Al Aziz Girls School near Beit Enoon roundabout.	47
Figure 2.1: Wadi Al Jeer–Al Sawahira Al Sharqiya Road (Segment A) Construction Works Progress – S-curve	49
Figure 2.2: Wadi Al Jeer–Al Sawahira Al Sharqiya Road (Segment B) Construction Works Progress – S-curve	50
Figure 2.3: Al Sawahira Al Sharqiya-Sheikh Sa'ed Road (Segment C) Construction Works Progress – S-curve	51

<b>Figure Name</b>	<b>No.</b>
Figure 2.4: Wadi Al Nar Road (Segment V) Works Progress – S-curve	52
Figure 2.5: Qalandiya-Jabaa Road Safety Enhancement Works Progress – S-curve	53
Figure 2.6: Al Thirwa Schools Road and Roads Retaining Structures Works Progress – S-curve	54
Figure 2.7: Milling and Overlay of Hebron Internal Roads Works Progress – S-curve	55
Figure 3.1: Landowner objections and stoppage of road excavation from St. A1+720 to St. A1+840 LHS. Coordination site visit with landowner and local council representatives to resolve this issue.	68
Figure 3.2: Landowner objections and stoppage of road excavation between St. A2+500 and St. A2+600. Coordination site visit with landowner and local council representatives to resolve this issue.	68
Figure 3.3: Palestinian related authorities while investigating the discovered caves.	71
Figure 3.4: Israeli related authorities while investigating the discovered Romanian well / cave at St. C0+280 C.L.	71
Figure 3.5: Existing Asbestos containing culvert at St. C0+122.	72
Figure 3.6: Existing active waste water stream (wadi) where the Box culvert at St. C0+130 was constructed.	73
Figure 3.7: Existing active waste water stream (wadi) where the Box culvert at St. C0+130 was constructed.	73
Figure 3.8: Challenging asphalt works due to heavy traffic and steep slopes.	74
Figure 3.9: Managing heavy traffic during the construction was challenging.	74
Figure 3.10: PALTEL Fiber optic cable installation works.	74
Figure 3.11: Solar lighting poles after relocation.	75
Figure 3.12: Existing hazards presented by high cliffs (residential area) over work area.	75
Figure 3.13: Existing hazards presented by high cliffs (residential area) over work area.	75
Figure 3.14: Work stoppage due to landowners’ objections on stone boulder construction from St. C0+000 to St. C0+140 RHS at Segment C.	76
Figure 3.15: Work stoppage due to landowners’ objections on subgrade works St. A0+350 to St. A0+590 at Segment C.	76
Figure 3.16: Work stoppage due to landowners’ objections on subgrade works St. A0+350 to St. A0+590 at Segment C.	76
Figure 3.17: Leakage of Existing Septic tanks along Segment A.	77
Figure 3.18: Leakage of Existing Septic tanks along Segment A.	77
Figure 3.19: Hebron municipality sewer line works at Al Mashroo Wadi Al Hariya Road from sta. 0+430 to sta. 0+460.	79
Figure 3.20: Hebron municipality underground utilities works at Al Mashroo’ Wadi Al Hariya Road from Sta. 0+840 to 0+940 LHS	79
Figure 3.21: Hebron municipality underground utilities works at Al Mashroo’ Wadi Al Hariya Road from Sta. 0+840 to 0+940 LHS	79
Figure 3.22: Hebron municipality underground utilities works at Al Deek Road from St. 0+680 to St.0+720.	79
Figure 3.23: Hebron municipality underground utilities works at Al Deek Road from St. 1+300 to St. 1+430.	79
Figure 3.24: Hebron municipality underground utilities works at Jabal Johar Road.	80
Figure 3.25: Hebron municipality underground utilities works at Jabal Johar Road.	80
Figure 3.26: Damages of thermoplastic road marking caused by Hebron municipality snow removal at Al Salam Road.	80
Figure 3.27: Removal of constructed median in University Road #2 after Hebron municipality removed snow from the road.	80
Figure 3.28: Severe weather (snow) at Beit Enoon Roundabout.	80
Figure 3.29: Snow removal by contractor from Hebron Internal Roads.	81
Figure 3.30: Snow removal by contractor from Hebron Internal Roads.	81
Figure 4.1: Safety Toolbox talk at Project 01- WJA	83
Figure 4.2: Safety Toolbox talk at Project 02- WJB	83
Figure 4.3: Safety Toolbox talk at Project 03- SSC	83
Figure 4.4: Safety Toolbox talk at Project 04- WNV	83
Figure 4.5: Safety Toolbox talk at Project 06- THR	83
Figure 4.6: Safety Toolbox talk at Project 07- HEB	83
Figure 4.7: Traffic signs for projects 01 and 02 detours.	86
Figure 4.8: Directional signs for Projects 01 and 02	86
Figure 4.9: Directional signs and cones at Projects 01 & 02	86
Figure 4.10: Traffic signs at Project 03-SSC.	86
Figure 4.11: Safety measures and traffic plan implementation at P04- WNV	86
Figure 4.12: flashers, new jersey barriers with metal sheets and directional signs at P04- WNV.	86
Figure 4.13: flashers and new jersey barriers with metal sheets at P04- WNV.	86
Figure 4.14: Safety measures at P05- QAL.	86
Figure 4.15: Safety during night work at P05- QAL – Flashers for equipment, special night lighting, reflective cones and barrels.	87
Figure 4.16: Safety during night work at P05- QAL – Flashers for equipment, special night lighting, and reflective cones.	87
Figure 4.17: Protection fence was temporarily installed along Project 02.	87
Figure 4.18: Barricades, orange fence and other safety measures around retaining walls area at P06- THR.	87

<b>Figure Name</b>	<b>No.</b>
Figure 4.19: Traffic control plan implementation at Project 07	87
Figure 4.20: Safety enhancement works (milling) for project 01 detour road.	87
Figure 4.21: Installation of guardrail for detour roads – P02-WJB	87
Figure 4.22: Temporary road marking for detour roads P01 & P02	87
Figure 4.23: Dust Control– spraying water at Project 01- WJA	88
Figure 4.24: Dust Control– spraying water at Project 03- SSC	88
Figure 4.25: Replanting of olive trees at Project 03- SSC	88
Figure 4.26: Irrigation of replanted olive trees at P03- SSC	88
Figure 5.1: Alternative Detour roads for Projects 01 and 02 (WJA and WJB)	90
Figure 5.2: Safety enhancement works (milling) for project 01 detour road.	90
Figure 5.3: Installation of guardrail for detour roads – P02-WJB	90
Figure 5.4: Temporary road marking for detour roads P01 & P02	90
Figure 5.5: Sample sheet of approved traffic control plan for Project 03- with the required approvals and stamps from all related authorities.	91
Figures 5.6: Project 04- WNV- Traffic was maintained at all times by implementing construction LHS/ RHS in stages.	91
Figures 5.6: Project 04- WNV- Sample sheet of approved traffic control plan.	92
Figures 5.7: Project 05- QAL- Sample sheet of approved traffic control plan.	92
Figures 5.8: Project 06-THR- Sample sheet of approved traffic control plan – Segment B.	93
Figures 5.9: Project 07-HEB- Sample sheet of approved traffic control plan – LHS/RHS for 4 lane road.	94
Figures 5.10: Project 07-HEB- Sample sheet of approved traffic control plan – Partial closure for roads when no alternative detours were available.	94
Figures 5.11: Project 07-HEB- Sample sheet of approved traffic control plan – Total close: when existing local roads were available as temporary detours.	95
Figures 5.12: Project 07-HEB- Beit Enoon Roundabout – approved traffic control plan – Phase I.	96
Figures 5.13: Project 07-HEB- Beit Enoon Roundabout – approved traffic control plan – Phase II.	96
Figures 5.14: Project 07-HEB- Beit Enoon Roundabout – approved traffic control plan – Phase III.	97
Figure 6.1: Subgrade Compaction Test -Project 01.	100
Figure 6.2: Subgrade Field density test – Project 03	100
Figure 6.3: Basecourse Field density test – Project 03	100
Figure 6.4: Asphalt Core Test – Project 01	100
Figure 6.5: Water Pressure Test– Project 01	100
Figure 6.6: Asphalt Core Test – Project 01	100
Figure 6.7: Basecourse Field density test – Project 07	100
Figure 6.8: Asphalt plates verification test – Project 07	100
Figure 7.1: Primary office meeting room.	107
Figure 7.2: Primary office- office room.	107
Figure 7.3: Primary office bathroom.	107
Figure 7.4: Primary office kitchen.	107
Figure 7.5: Secondary office 1- Lobby	108
Figure 7.6: Secondary office 1- office room	108
Figure 7.7: Secondary office 1- kitchen.	108
Figure 7.8: Secondary office 1- bathroom.	108
Figure 7.9: Secondary office 2- office room.	108
Figure 7.10: Secondary office 2- office room.	108
Figure 11.1: Approved permanent sign text for Projects 01 and 02	123
Figure 11.2: Projects 01 & 02 permanent sign after installation.	123
Figure 11.3: Approved permanent sign text for Project 03.	123
Figure 11.4: Permanent sign after installation- Project 03.	123
Figure 11.5: Approved permanent sign text for Project 04.	123
Figure 11.6: Permanent sign after installation- Project 04.	123
Figure 11.7: Approved permanent sign text for Project 05.	123
Figure 11.8: Permanent sign after installation- Project 05.	123
Figure 11.9: Approved permanent sign text for Project 06.	124
Figure 11.10: Permanent sign after installation- Project 06.	124
Figure 11.11: Approved permanent sign text for Project 07.	124
Figure 11.12: Permanent sign after installation- Project 07.	124
Figure 11.13: Approved permanent sign text for Project 07- Beit Enoon Roundabout.	124
Figure 11.14: Permanent sign after installation- Project 07- Beit Enoon Roundabout.	124

<b>Figure Name</b>	<b>No.</b>
Figure 11.15: Approved and distributed Flyers Text – Projects 01 and 02.	125
Figure 11.16: Approved and distributed Flyers Text – Project 03.	125
Figure 11.17: Approved and distributed Flyers Text – Project 04.	125
Figure 11.18: Approved and distributed Flyers Text – Project 05.	125
Figure 11.19: Approved and distributed Flyers Text – Project 06.	126
Figure 11.20: Approved and distributed Flyers Text – Project 07.	126

## LIST OF TABLES

<b>Table Name</b>	<b>Page No.</b>
Table 2.1: Project 01- Wadi Al Jeer–Al Sawahira Al Sharqiya Road (Segment A) Progress.	49
Table 2.2: Project 02- Wadi Al Jeer–Al Sawahira Al Sharqiya Road (Segment B) Progress	50
Table 2.3: Project 03- Al Sawahira Al Sharqiya-Sheikh Sa’ed Road (Segment C) Progress	51
Table 2.4: Project 04- Wadi Al Nar Road (Segment V) Progress	52
Table 2.5: Project 05- Qalandiya-Jabaa Road Safety Enhancement Progress	53
Table 2.6: Project 06- Al Thirwa Schools Road and Roads Retaining Structures Progress	54
Table 2.7: Project 07- Milling and Overlay of Hebron Internal Roads Progress	55
Table 4.1: NUCs Log	84
Table 4.2: Accidents log	84-85
Table 6.1: NCR Log	99
Table 6.2: Tests Log summary table.	101-105
Table 8.1: Variation Orders log	110-113
Table 8.2: Variation Order Requests log	114-115
Table 8.3: Payments log	116
Table 10.1: Submittals Statistics log	120

## ABBREVIATIONS

INP	Infrastructure Needs Program
NOA	Notice of Award
NTP	Notice To Proceed
PA	Palestinian Authority
TO	Task Order
USAID	United States Agency for International Development
WBG	West Bank and Gaza
VO	Variation Order
QC	Quality Control
NUC	Notice for Unsafe Condition
RFI	Request For Information
MOPWH	Ministry of Public work and Housing
PCBS	Palestinian Central Bureau of Statistics
CMC	Construction Management Contractor [Black and Veatch]
PQCM	Project Quality Control Manager
NGL	Natural Ground Level
Km	Kilometer
NIS	New Israeli Shekel
RCI	Road Cost Index
JDECO	Jerusalem District Electric Company
ROW	Right of Way
TOM	Task Order Manager
SEO	Safety and Environmental Officer

## EXECUTIVE SUMMARY

Task Order 04 consists of **seven** physically separate subprojects in the mid and southern areas of the West Bank. The seven projects are of varying magnitude ranging from small to moderately high with varying time frames ranging from short to medium. This Task Order under the Infrastructure Needs Program (INP-II) is financed by the United States Agency for International Development (USAID).

The scope of this task order required the rehabilitation of the following roads:

- PROJECT 1: Wadi Al Jeer–Al Sawahira Al Sharqiya (Segment A)
- PROJECT 2: Wadi Al Jeer–Al Sawahira Al Sharqiya (Segment B)
- PROJECT 3: Al Sawahira Al Sharqiya-Sheikh Sa’ed Road (Segment C)
- PROJECT 4: Wadi Al Nar Road (Segment V)
- PROJECT 5: Qalandiya-Jabaa Road Safety Enhancement
- PROJECT 6: Al Thirwa Schools Road and Roads Retaining Structures
- PROJECT 7: Milling and Overlay of Hebron Internal Roads

The subject roads suffered from deteriorated conditions that included worn out surface, lack of proper shoulder and traffic management signage, as well as lack of road markings to provide safe driving conditions.

The budget of \$13,645,234 mandated reconstruction, safety enhancement and overlay of the aforementioned road segments. The Day work / savings were utilized to expand the scope of the projects to and provide additional road rehabilitation (additional milling, retaining walls, storm drainage systems, Beit Enoon Roundabout construction and safety enhancement) and installing new water and sewer lines.

During the course of construction, delays occurred due to severe weather (snow), existence of underground utilities, new underground utility installation by others (local councils and utility owners), Landowners continuous work disruption objecting to road R.O.W. and road alignment resulting in several delays and work stoppages, and additional works requested by USAID in response to local councils. Time extensions were necessitated to cover excusable delays mentioned above and changes in the requirements within the scope of works. APCO/ArCon mitigated the additional delays by increasing resources and working additional hours and night shifts.

This report documents this Task Order’s construction performance from construction commencement through completion and final acceptance. Attached are annexes documenting the projects record in accordance with the contract conditions and applicable requirements including technical project specifications.

# 1

## BACKGROUND

## **BACKGROUND**

Part of the USAID mission in the West Bank / Gaza focuses on rehabilitation of the existing aging and largely neglected infrastructure. The USAID's investment is intended to provide much needed improvement and invigorate the local economy by creating job opportunities for skilled and unskilled local workforce.

USAID investment in the infrastructure concentrated on road improvements, potable water, and water transmission pipe projects, as well as schools and other municipal projects.

In December 2011, APCO/ArCon was selected again by USAID for INP II award. INP II is a 750 Million USD shared ceiling spanning a five year period.

As of the end of March 2014, APCO/ArCon completed Task Order 13-00004 under the INPII awarded by USAID in 2013 and valued at **\$13.6** Million.

## TASK ORDER BACKGROUND

Reconstruction of Task Order No. 04 road projects is part of USAID's 5-year, Infrastructure Needs Program (INPII) Task Order No.13-00004 Scope was completed on March 30, 2014. This Task Order consists of 7 separate road projects distributed in the middle and southern regions in the West Bank as shown in Figure 1.1. The subject roads suffered from deteriorated conditions that included worn out surface, lack of proper shoulder and traffic management signage, as well as lack of road markings to provide safe driving conditions.

PROJECT 1:	Wadi Al Jeer–Al Sawahira Al Sharqiya (Segment A)
PROJECT 2:	Wadi Al Jeer–Al Sawahira Al Sharqiya (Segment B)
PROJECT 3:	Al Sawahira Al Sharqiya-Sheikh Sa'ed Road (Segment C)
PROJECT 4:	Wadi Al Nar Road (Segment V)
PROJECT 5:	Qalandiya-Jabaa Road Safety Enhancement
PROJECT 6:	Al Thirwa Schools Road and Roads Retaining Structures
PROJECT 7:	Milling and Overlay of Hebron Internal Roads

Table 1.1 summarizes this Task Order technical data.

**Table 01: Task Order Overview and Technical Data**



Figure 1.1: Task Order 04 road Projects location in the WB.

Project Name	Multiple Roads Project in the South Area (MRS)
Contract No.	AID-294-I-00-12-00005
Task Order No.	AID-294-TO-13-00004
Employer	United States Agency for International Development-USAID
Contractor	APCO/ArCon
Engineer / CMC	Black and Veatch
Notice of Award (NOA)	March 22, 2013
Notice To Proceed (NTP)	April 15, 2013
Task Order Contract Value	\$13,645,234
Projects Total Value	\$12,945,234
Day Work	\$700,000
Modified Projects Total Value	\$13,613,229.30 as per VO#20
Modified Day Work	\$32,004.70 as per VO#20
Original Completion Date	November 10, 2013
Modified Completion Date	March 30, 2014 as per VO#19
Actual Completion Date	March 30, 2014

## Project 01- WJA- Wadi Al Jeer–Al Sawahira Al Sharqiya Road (Segment A)



Figure 1.2: Project 01- Wadi Al Jeer–Al Sawahira Al Sharqiya Road (Segment A) location in the WB.

Project Description	Reconstructing a total of 2.883 km (Segment A) of Wadi Al Jeer–Al Sawahira Al Sharqiya Road. Segment A is a two lane arterial road sited in Area C and connects Wadi Al Nar Road to Al Ezzariya Road (previously constructed by USAID). This arterial road connects the northern to the southern districts of the West Bank, facilitating the thoroughfare of people and traffic and contributing to boosting the economic growth. The SOW included road widening, pavement layers construction, drainage, road marking, provision of street lighting (solar panels), and furnishing the safety furniture.		
Total Road Length	Original Scope	Reconstruction of 2.70 km of arterial road.	
	Actual scope	Reconstruction of 2.883 km of arterial road.	
Utilizing the Day-work amount	Additional Scope	Topping (replacement of unsuitable materials)	2,021.99 Cu.m
		Installation of water pipelines (1", 2" and 3")	1,270.30 L.m
		Stone Boulders	341.15 Sq.m
		600mm Dia. R.C storm water drainage pipe	16 L.m
Project Value	\$3,448,431.00		
Modified Project Value	\$3,926,336.45 as per VO#20		
Subcontractor Name	Tarifi Contracting Company		
Start of Construction	May 26, 2013		
Contractual period of Performance	210 Calendar Days		
Contractual End Date	Nov. 10, 2013		
Modified period of Performance	250 Calendar Days		
Modified End Date	Dec. 20, 2013		
Actual Completion Date	Dec. 26, 2013 (contractor objected to USAID and contends delay is excusable, USAID determined that the encountered delays were inexcusable)		
Construction site handover	Dec. 30, 2013		
Final Acceptance Certificate	Dec. 26, 2013		
Constructions works	Excavation works, embankment filling, pavement layers construction, installation and/or rehabilitation of storm water drainage systems, retaining walls, stone walls and boulder walls construction, installation of safety features, landscaping and any other works needed to complete this project as specified.		
Safety / Furnitures	Road marking, guardrails, cat eyes, traffic signs, solar lighting and medians.		



Figure 1.3: Project 01- Wadi Al Jeer–Al Sawahira Al Sharqiya Road (Segment A) location in the WB.

## SCOPE OF WORK

### PROJECT 1: Wadi Al Jeer–Al Sawahira Al Sharqiya (Segment A)

Road construction included the following work activities:

Excavation and earthworks	77,404.64 Cu.m	Concrete works (B150 and B250)	881.65 Cu.m
Topping layer (20 cm thickness)	2,021.99 Cu.m	Stone Boulders	341.15 Sq.m
Basecourse layers (2 layers 20 cm each)	87,702.03 Sq.m	Stone walls	134.43 Cu.m
Basecourse layers (15 cm)	2,015.70 Sq.m	Installation of water pipelines (1", 2" and 3")	1,270.30 L.m
Bituminous prime coat	39,310.75 Sq.m	Precast concrete curbstone	772.20 L.m
Bituminous binder course (7cm)	37,972.71 Sq.m	Precast concrete curbstone for medians	493.60 L.m
Bituminous tack coat	37,379.67 Sq.m	Precast concrete edge beam	393.00 L.M
Bituminous wearing course (5 cm)	38,219.08 Sq.m	Supply and install solar street lighting	72 unit
Storm water drainage pipes	86.50 L.m	Guardrail, signs, road marking and cat eyes	

**Sketch 1-A Wadi Al Jeer - Al Sawahreh Al Sharqiah Road - Seg. A**

**Scope of Work**

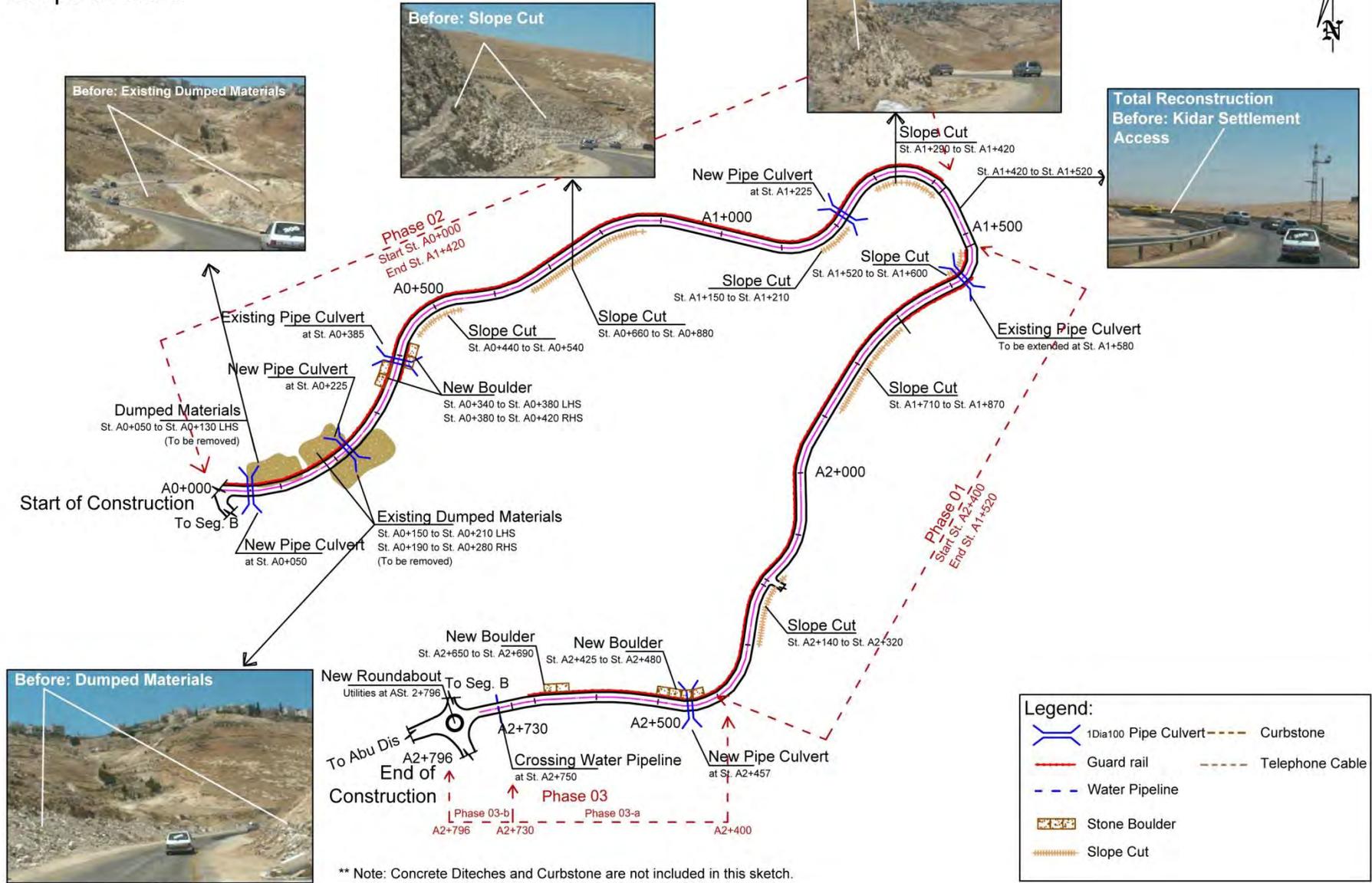


Figure 1.4: Project 01- Wadi Al Jeer–Al Sawahira Al Sharqiya Road (Segment A) **original scope** of work.

## Project 02- WJB- Wadi Al Jeer–Al Sawahira Al Sharqiya Road (Segment B)



Figure 1.5: Project 02- Wadi Al Jeer–Al Sawahira Al Sharqiya Road (Segment B) location in the WB.

Project Description	Upgrade a total of 0.972 km (Segment B) of the Wadi Al Jeer–Al Sawahira Al Sharqiya Road. Wadi Al Jeer–Al Sawahira Al Sharqiya Road (Segment B) is a one-lane road that starts at the Container Checkpoint, intersects with Wadi Al Jeer–Al Sawahira Al Sharqiya Road (Segment A) and ends up at Az Zariyieh Road (previously constructed by USAID). Roadwork is sited in Area C.	
Total Road Length	Original Scope	Reconstruction of 0.99km of arterial road.
	Actual scope	Reconstruction of 0.972km of arterial road.
	Additional Scope Utilizing the Day-work amount	Installation of 2" and 1" pipeline including one Gate valve 677 L.M Precast Concrete curbstone 146 L.M Precast Concrete edge beam 58 L.M
Project Value	\$657,583.50	
Modified Project Value	\$618,115.51 as per VO#7	
Subcontractor Name	Technical Group Company	
Start of Construction	June 04, 2013	
Contractual period of Performance	150 Calendar Days	
Contractual End Date	September 11, 2013	
Modified period of Performance	181 Calendar Days	
Modified End Date	Oct. 12, 2013	
Actual Completion Date	Oct. 07, 2013	
Construction site handover	Oct. 07, 2013	
Final Acceptance Certificate	Oct. 07, 2013	
Constructions works	Excavation and earth works, embankment filling, pavement layer construction, construction of gravity retaining structures and stone walls, installation and/or rehabilitation of storm water drainage systems, 2" and 1" pipeline installation, installation of safety features and any other works needed to complete this project as specified.	
Safety / Furnitures	Road marking, guardrails, cat eyes, traffic signs and sidewalks.	

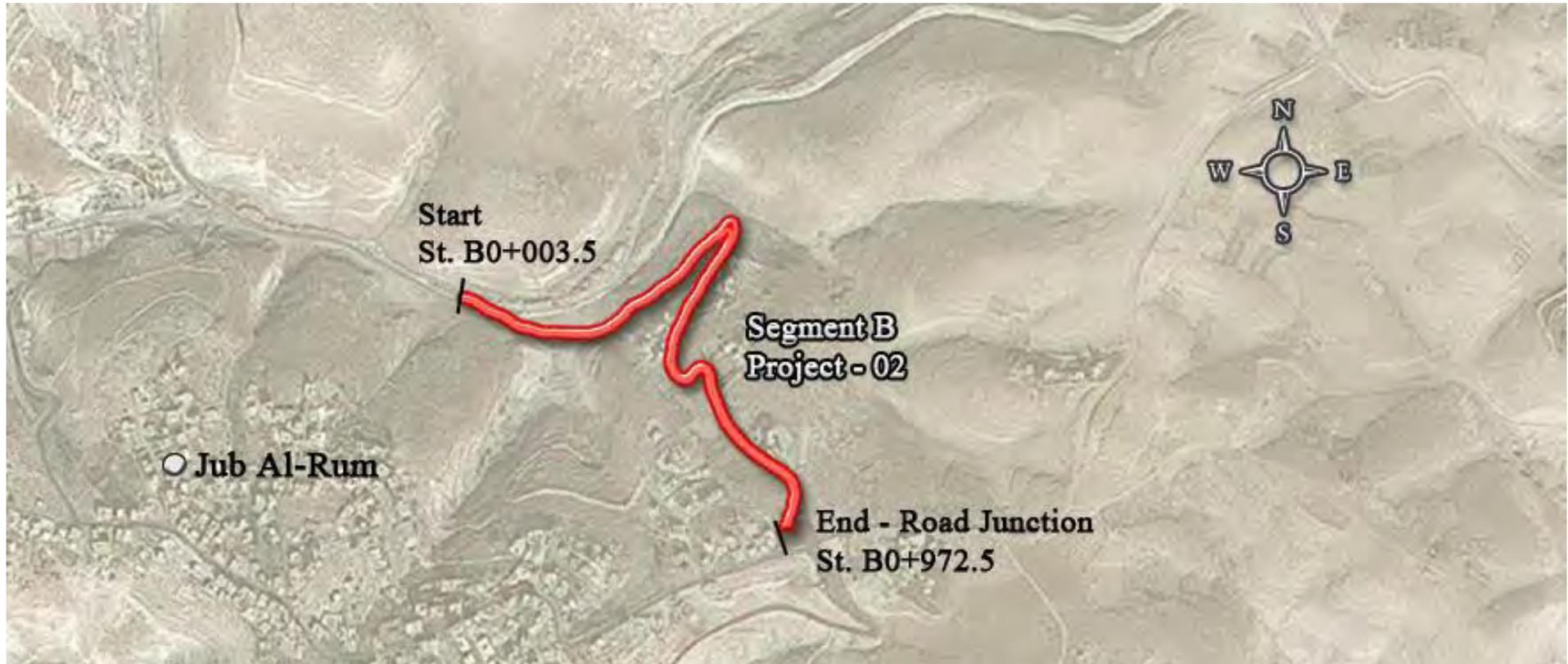


Figure 1.6: Project 02- Wadi Al Jeer–Al Sawahira Al Sharqiya Road (Segment B) location in the WB.

## SCOPE OF WORK

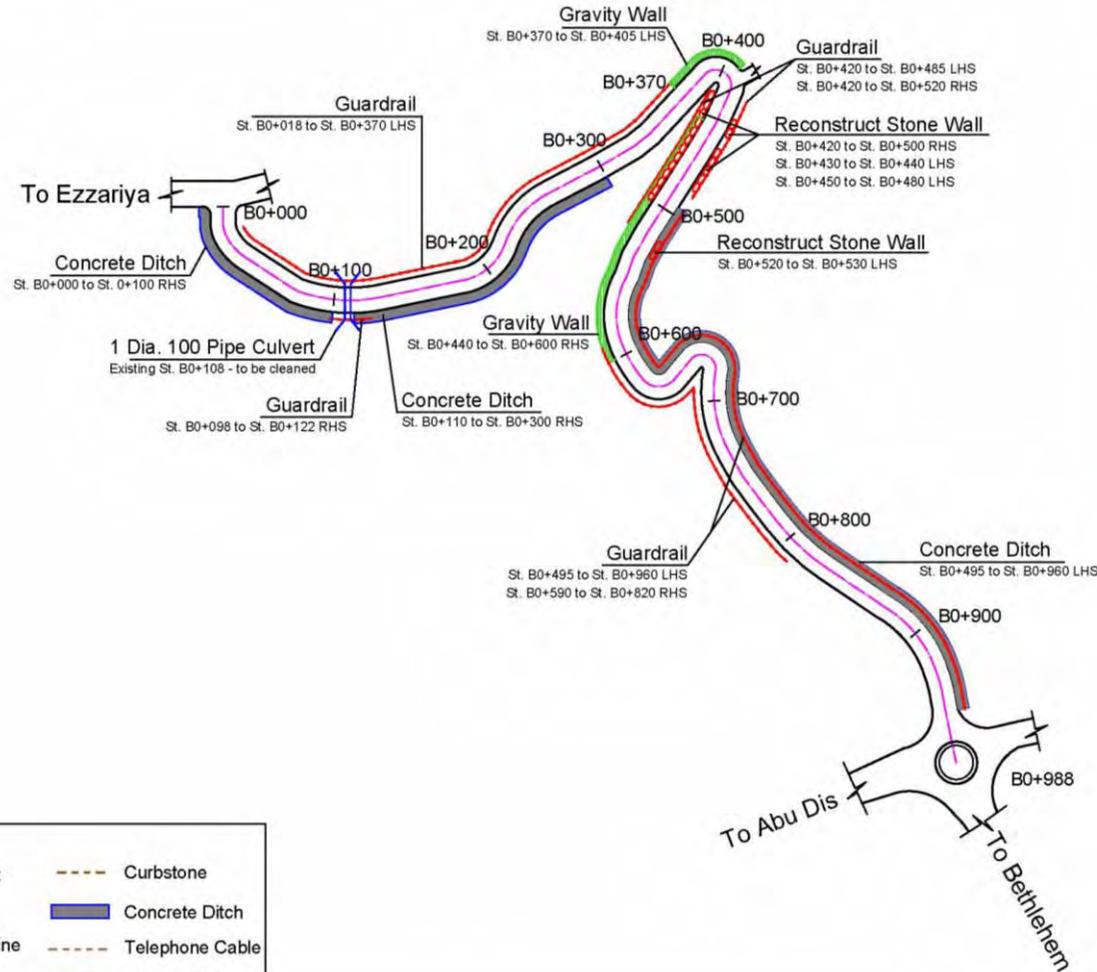
### PROJECT 2: Wadi Al Jeer–Al Sawahira Al Sharqiya (Segment B)

Road construction included the following work activities:

Excavation and earthworks	6,347.84 Cu.m	Stone walls	451.81 Cu.m
Sub-base and 2 basecourse layers	16,295.09 Sq.m	2" pipeline installation	620 L.m
Topping layer	217.92 Cu.m	Precast concrete curbstone	146 L.m
Bituminous prime coat	6,478.12 Sq.m	Precast concrete edge beam	58 L.m
Bituminous wearing course	6,377.95 Sq.m	Traffic signs	
Concrete works	274.04 Cu.m	Road marking and cat eyes	
Gravity retaining walls	326.30 Cu.m	Guardrail	

**Sketch 2-A** Wadi Al Jeer - Al Sawahreh Al Sharquiah Road - Seg. B

Scope of Work



**Legend:**

	Pipe Culvert		Curbstone
	Guard rail		Concrete Ditch
	Water Pipeline		Telephone Cable
	Stone Boulder		Gravity Wall
	Slope Cut		Stone Wall

\*\* Note: Solar Lighting Poles and Sidewalks are not included in this sketch.

**Before Construction Photos:**



Figure 1.7: Project 02- Wadi Al Jeer–Al Sawahira Al Sharqiya Road (Segment B) **original scope** of work.

### Project 03- SSC- Al Sawahira Al Sharqiya-Sheikh Sa'ed Road (Segment C)



Figure 1.8: Project 03- Al Sawahira Al Sharqiya-Sheikh Sa'ed Road (Segment C) location in the WB.

Project Description	Upgrade a total of 1.297 km (Segment C) of the Al Sawahira Al Sharqiya-Sheikh Sa'ed Road. The road is a two-lane local road that links the town of Al Sawahira Al Sharqiya with the community of Sheikh Sa'ed in the Governorate of Jerusalem. Road works are sited in Area B.	
Total Road Length	Original Scope	Reconstruction of 1,297.16 L.m of local road.
	Actual Scope	Reconstruction of 1,297.16 L.m of local road.
	Additional Scope	
Utilizing the Day-work amount	Gravity walls	549.94 Cu.m
	Sewerage 8" UPVC pipes works	1,151.73 L.m
	Sewerage 6" UPVC pipes works	252.55 L.m (VO 2.1.3 and VO 12.1)
	Sewerage Manholes (1000 and 600mm diameter)	56 Unit (VO 2.1.4, 2.1.5 and VO 12.2)
	New 4" water pipeline and 2" house connections	901.43 L.m
Project Value	\$887,685.75	
Modified Project Value	\$1,169,210.66 as per VO#20	
Subcontractor Name	Al Fakher General Contracting Company	
Start of Construction	May 28, 2013	
Contractual period of Performance	180 Calendar Days	
Contractual End Date	October 11, 2013	
Modified period of Performance	252Calendar Days	
Modified End Date	Dec. 22, 2013	
Actual Completion Date	Dec. 23, 2013 (contractor objected to USAID and contends delay is excusable, USAID determined that the encountered delay is inexcusable)	
Project Punch List	Dec. 30, 2014	
Construction site handover	Dec. 30, 2014	
Final Acceptance Certificate	Dec. 23, 2014	
Constructions works	Excavation works, construction of retaining structures, stone walls, embankment filling, pavement layer construction, installation and/or rehabilitation of storm water drainage systems, installation of sewerage and waterlines, construction of a box culvert and installation of safety features and any other works needed to complete this project as specified.	
Safety / Furnitures	Road marking, guardrails, cat eyes, traffic signs and curbstone.	



Figure 1.9: Project 03- Al Sawahira Al Sharqiya-Sheikh Sa'ed Road (Segment C) location in the WB.

## SCOPE OF WORK

### PROJECT 3: Al Sawahira Al Sharqiya-Sheikh Sa'ed Road (Segment C)

Road construction included the following:

Excavation and earthworks	12,283.46 Cu.m	Concrete works (B150, B250, and B300)	726.62 Cu.m
Topping layer	488.70 Cu.m	Gravity walls	549.94 Cu.m
Rock fill layer	991.11 Cu.m	Stone walls	115.50 Cu.m
Basecourse layers	20,253.45 Sq.m	Sewerage 8" UPVC pipes works	1,151.73 L.m
Bituminous prime coat	9,011.00 Sq.m	Sewerage 6" UPVC pipes works	252.55 L.m
Bituminous wearing course (7cm)	7,692.00 Sq.m	Sewerage Manholes (1000 and 600mm diameter)	56 Unit
Bituminous tack coat	482.00 Sq.m	New 4" water pipeline and 2" house connections	901.43 L.m
Bituminous wearing course (5 cm)	1,056.00 Sq.m	Precast concrete curbstone	63 L.m
Storm water drainage pipes (400mm Dia.)	37.50 L.m	Guardrail, signs, road marking and cat eyes	

**Sketch 3-A** Al-Sheikh Sa'ed Road - Seg. C

**Scope of Work**

Before Construction Photos:



**Note:**  
- Gravity concrete retaining walls were constructed instead of stone boulder between St.0+936 to St.1+057 RHS per RFI-13-00004-MRS-010

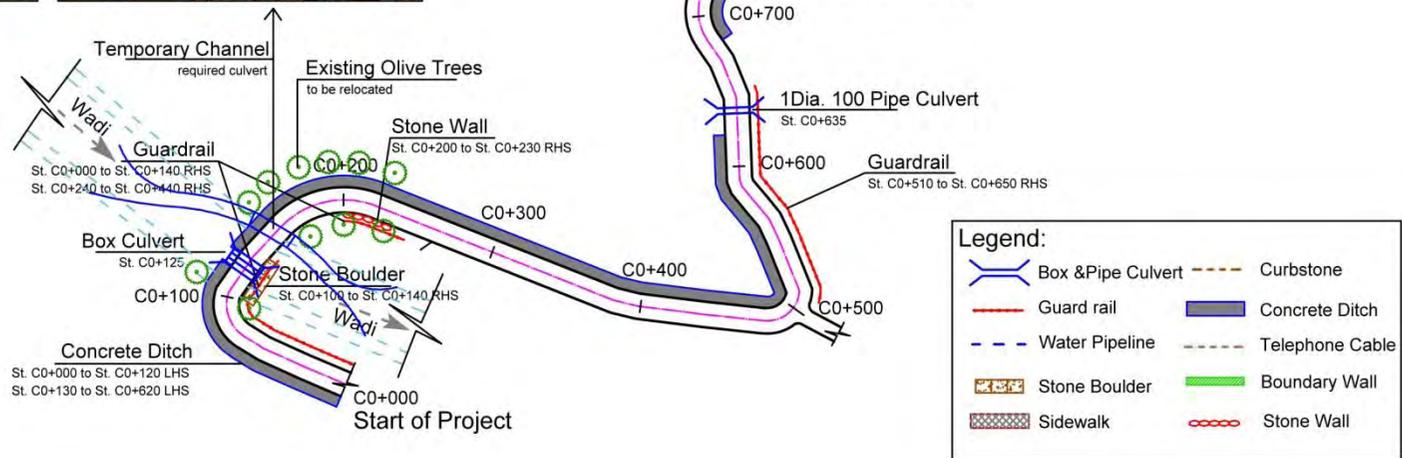


Figure 1.10: Project 03- Al Sawahira Al Sharqiya-Sheikh Sa'ed Road (Segment C) **original scope** of work.

## Project 04- WNV- Wadi Al Nar Road (Segment V)



Figure 1.11: Project 04- WNV- Wadi Al Nar Road (Seg. V) location in the WB.

Project Description	Milling and Overlay of 1.082 km of the Wadi Al Nar (Segment V) Road. In addition to safety enhancement (milling and road marking) for 0.83 km. The road is a two-lane regional road that connects the Northern districts of the West Bank to the Southern ones. The road serves as the primary road for all commercial and residential traffic travelling between the Northern and Southern West Bank. Roadwork is sited in Area B.	
Total Road Length	Original Scope	Road widening, milling and overlay 1.00km
	Actual scope	Road widening, milling and overlay 1.082km
Additional Scope Utilizing the Day-work amount	Safety Enhancement (milling and road marking)	831.68 L.m
	Retaining gravity walls	78.55 Cu.m
	Bituminous Binder Course (5 and 7cm)	8,930.35 Sq.m
	Landscaping for widening area (stone walls, agricultural soil and precast concrete curbstone).	
Project Value	\$1,113,871.50	
Modified Project Value	\$1,230,514.23 as per VO#7	
Subcontractor Name	Technical Group Company	
Start of Construction	May 21, 2013	
Contractual period of Performance	150 Calendar Days	
Contractual End Date	September 11, 2013	
Modified period of Performance	178 Calendar Days	
Modified End Date	Oct. 09, 2013	
Actual Completion Date	October 07, 2013	
Construction site handover	October 07, 2013	
Final Acceptance Certificate	October 07, 2013	
Constructions works	Milling the existing asphalt layer and overlay of a fresh asphalt layer on specified sections of the roadway. Work also included road widening, slope cut, excavation works, embankment filling, pavement layer construction for the widened area and/or patching and leveling, installation and/or rehabilitation of storm water drainage systems, sewerage works, retaining gravity walls, installation of safety features, landscaping, and any works needed to complete this project as specified.	
Safety / Furnitures	Road marking, guardrails, cat eyes and traffic signs	



Figure 1.12: Project 04- WNV- Wadi Al Nar Road (Seg. V) location in the WB.

**SCOPE OF WORK :** Road construction included the following:

Excavation and earthworks	16,726.15 Cu.m	Bituminous wearing course (Basalt)	11,205.74 Sq.m	Concrete works	431.41 Cu.m
Sub-base and basecourse layer	12,210.50 Sq.m	Asphalt patching	764.11 Ton	Gravity retaining walls	78.55 Cu.m
Bituminous prime coat	5,324.50 Sq.m	Asphalt milling	20,327.20 Sq.m	Stone walls	84.83 Cu.m
Bituminous tack coat	15,238.28 Sq.m	6" UPVC sewerage pipes	74.10 L.m	Precast concrete edge beam	174.0 L.m
Bituminous binder course	8,930.35 Sq.m	Precast curbstone for medians	50 L.m	Road marking, cat eyes, traffic signs and Guardrail	

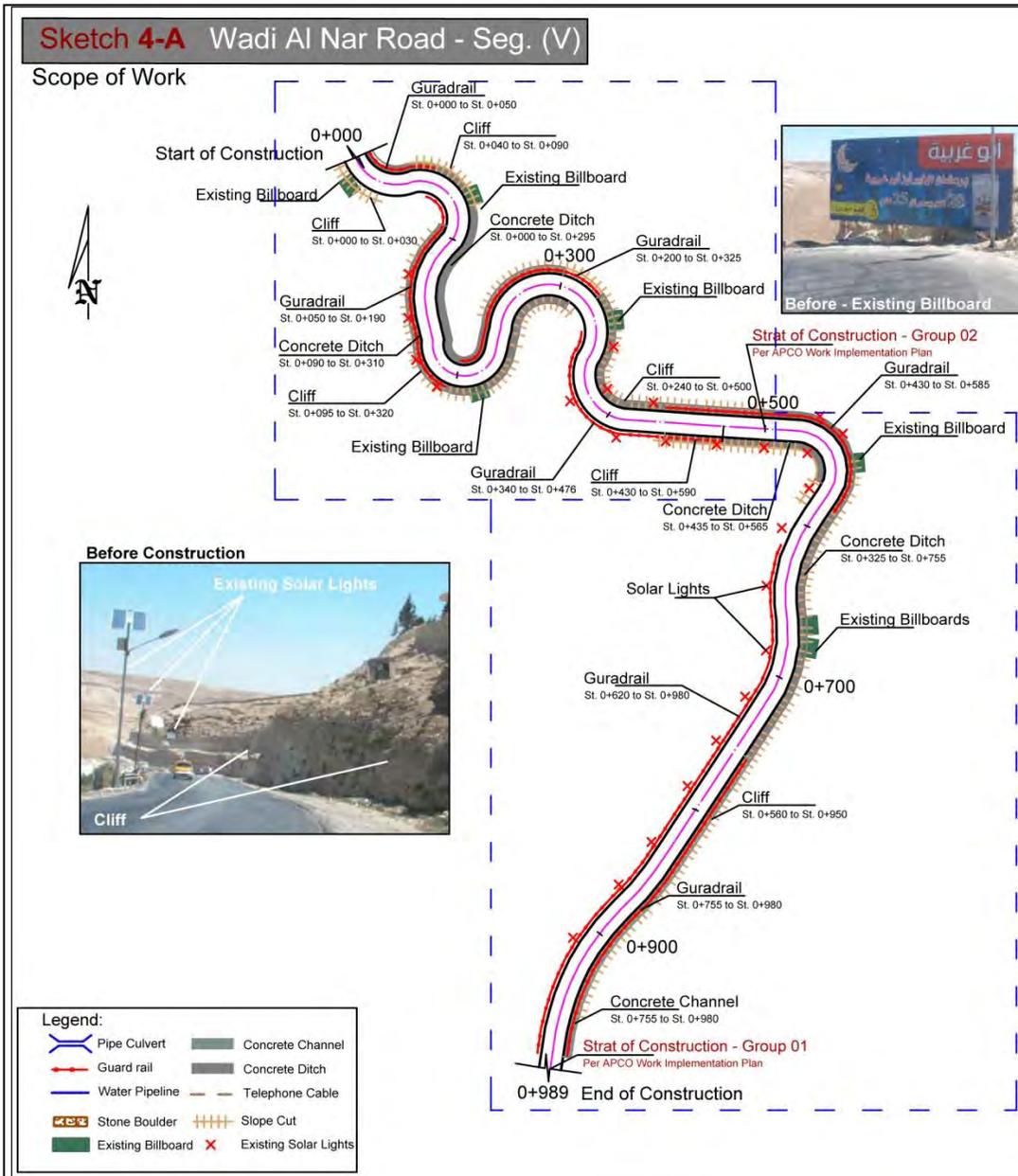


Figure 1.13: Project 04- WNV- Wadi Al Nar Road (Seg. V) Original scope of work.



Before construction – St. 0+170 Forward.



Project completed – New guardrail installed, road marking and cat eyes were installed and finished – St. 0+170 Forward.

## Project 05- QAL- Qalandiya-Jabaa Road Safety Enhancement



Figure 1.14: Project 05- QAL- Qalandiya-Jabaa Road Safety Enhancement Location in the WB.

Project Description	Upgrade safety measures for the existing Qalandiya-Jabaa Road with a total length of 2.13 km, including 591 LM of milled and overlaid stretch. The road is a three-lane arterial road located within the Governorate of Jerusalem. Roadwork is sited in Area C.
Total Road Length	
Original Scope	Safety enhancement for 1.4km of arterial road.
Modified scope	Safety Enhancement of 2,133.26 L.m inclusive of milling and overlay of 590.83 L.m
Utilizing the Day-work amount	
Project Value	\$805,045.50
Modified Project Value	\$597,720.26 as per VO#4
Subcontractor Name	Shaltaf General Contracting Company
Start of Construction	June 30, 2013
Contractual period of Performance	120 Calendar Days
Contractual End Date	August 12, 2013
Modified period of Performance	134 Calendar Days
Modified End Date	Aug. 26, 2013
Actual Completion Date	Aug. 26, 2013
Project Punch List	Sep. 02, 2013 (inspection was originally scheduled on August 26, 2013 but rescheduled to Sep. 02, 2013 due to security reasons)
Construction site handover	Aug. 26, 2013
Final Acceptance Certificate	Aug. 26, 2013
Constructions works	Milling of the existing asphalt layer and the overlay of a fresh asphalt layer on specified sections of the roadway. Work also includes installation of a median, additional safety features (signage, road marking, cat eyes, and guardrails) and other works needed to complete this project as specified.
Safety / Furnitures	Road marking, guardrails, cat eyes, and traffic signs.

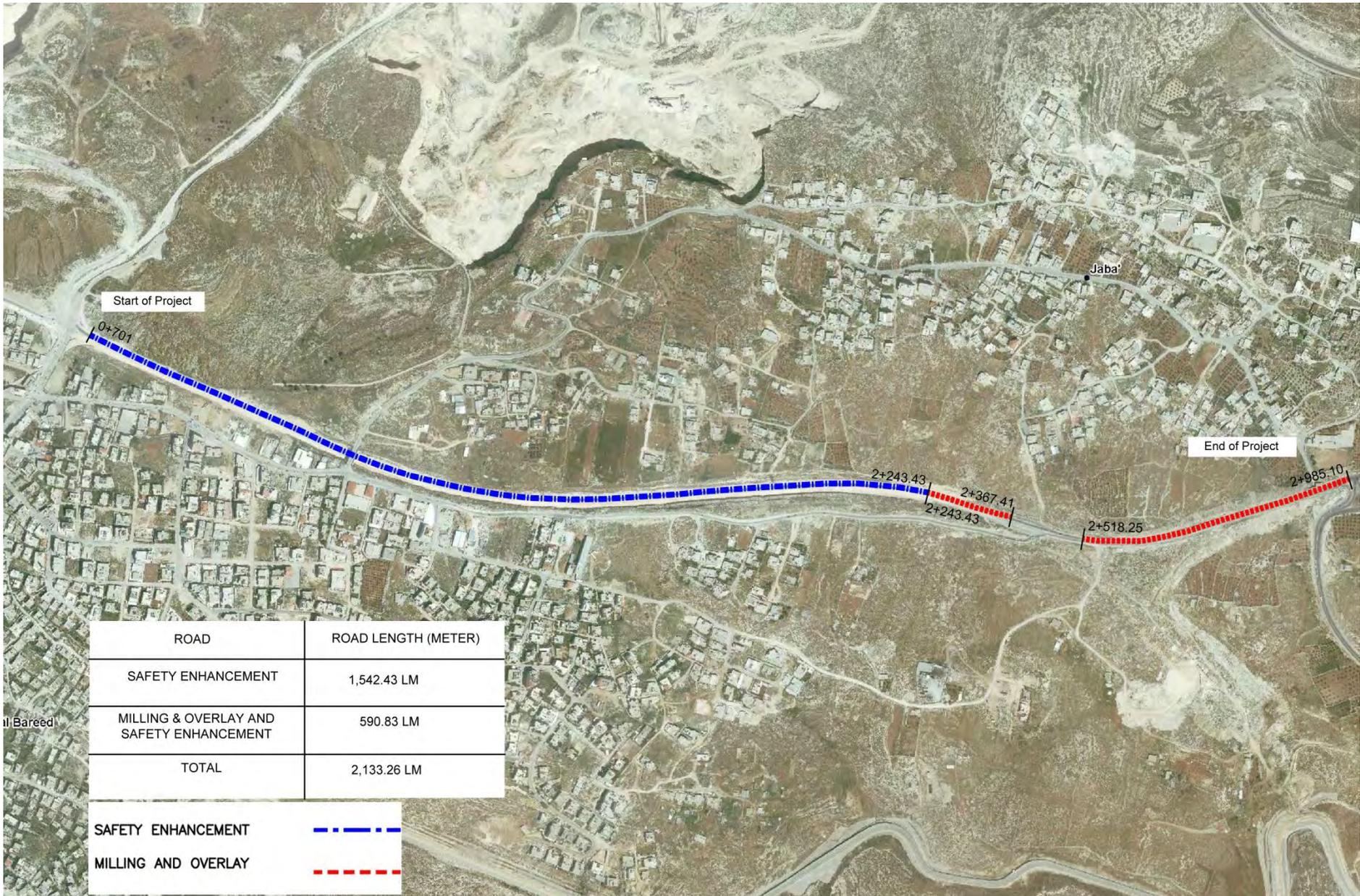


Figure 1.15: Project 05- QAL- Qalandiya-Jabaa Road Safety Enhancement location in the West Bank and scope.



Before construction –St. 1+600 forward.

Project completed – New Guardrail installed at the C.L, road marking and cat eyes were installed and finished.

Figure 1.16: Project 05- QAL- Qalandiya-Jabaa Road Safety Enhancement work progress.

**SCOPE OF WORK**

**PROJECT 5: Qalandiya-Jabaa Road Safety Enhancement**

Scope of work was substantially reduced and new guardrail type was requested. Final road construction scope included the following work items:

Bituminous tack coat	5,392 Sq.m	Traffic Signs
Bituminous wearing course (4cm)	5,392 Sq.m	Road marking and cat eyes
Asphalt patching/ leveling course	217 Ton	Guardrails
Asphalt milling	5,480 Sq.m	
Precast curbstone for medians	96 L.m	

## Project 06- THR- Al Thirwa Schools Road and Roads Retaining Structures



Figure 1.17: Project 06- THR- Al Thirwa Schools Road and Roads Retaining Structures location in the WB.

Project Description	Upgrade of a total of 1.665 km of Al Thirwa Schools Road. Al Thirwa Schools Road is located in the town of Halhul. Road works is sited in Areas A and B.		
Total Road Length	Original Scope	Retaining Walls and Reconstruction of	1.7km (Segments A, B and C) at Al Thirwa 1.3km (Segments A and B) at Nuba and Kharas
	Modified Scope	Retaining Walls and Reconstruction of	1.664km (Segments A, B and C) at Al Thirwa
	Additional Scope	Repair of existing septic tanks Installation of 400mm dia. R.C. pipes Basecourse layer (25cm thickness)	 32.80L.m 1,469.50 Sq.m
Project Value	\$1,568,857.50		
Modified Project Value	\$1,233,775.91 as per VO#8		
Subcontractor Name	Al Fakher Co. , Al Sadek Co. and Al Tafawouq Co.		
Start of Construction	June 07, 2013		
Contractual period of Performance	180 Calendar Days		
Contractual End Date	October 11, 2013		
Modified period of Performance	201 Calendar Days		
Modified End Date	November 01, 2013		
Actual Completion Date	October 31, 2013		
Construction site handover	October 31, 2013		
Final Acceptance Certificate	October 31, 2013		
Constructions works	Excavation works, construction of retaining walls, stone boulders, stone walls, embankment filling, pavement layer construction, installation and/or rehabilitation of storm water drainage systems, 2” and 4” waterlines, installation of safety features and any other work items needed to complete this project as specified.		
Safety / Furnitures	Road marking, guardrails, cat eyes, traffic signs, and sidewalks.		

## SCOPE OF WORK

### PROJECT 6: Al Thirwa Schools Road and Roads Retaining Structures

This project included reconstruction and rehabilitation of the followings:

Segment A	658.50 L.m
Segment B	518.00 L.m
Segment C	488.00 L.m

#### The following work items were performed:

Excavation and Earth Works	5,620.32 Cu.m
Basecourse layers	26,031.49 Sq.m
Bituminous prime coat	9,995.68 Sq.m
Bituminous wearing course	9,995.68 Sq.m
Hot asphalt leveling course	58.20 Ton
R.C. Drainage pipes 400mm	32.80L.m
Concrete works	880.70 Cu.m
Gravity retaining walls	776.24 Cu.m
Precast concrete curbstone	1,170 L.m
Stone walls	603.44 Cu.m
Boulder walls	830.64 Sq.m
2" steel pipeline installation	1,096.30 L.m
4" steel pipeline installation	738.00 L.m
Chambers works	13 Unit
Repair existing septic tanks	5 Units
Traffic Signs	
Road marking and cat eyes	
Guardrails	

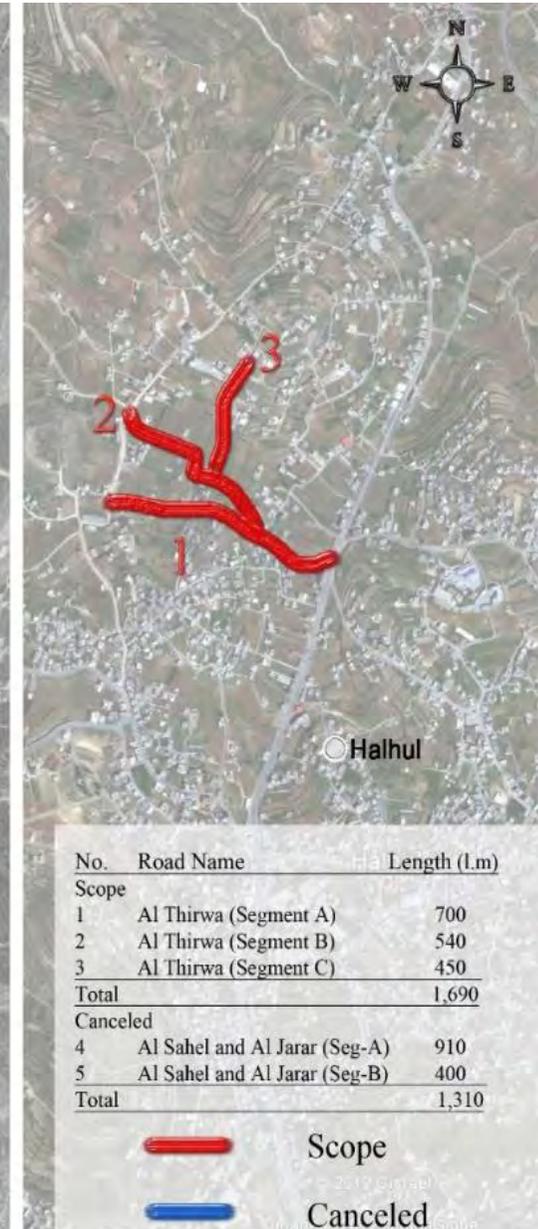
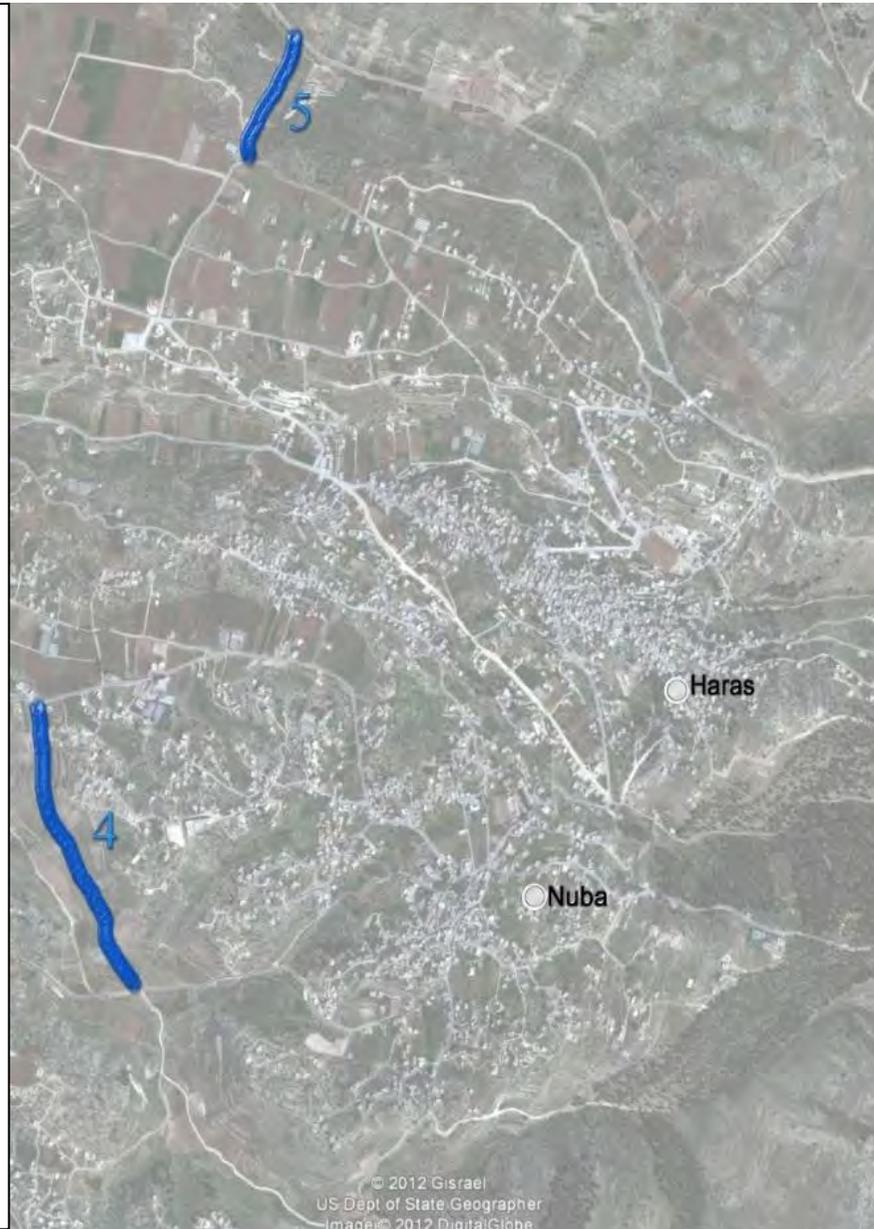


Figure 1.18: Project 06- THR- Al Thirwa Schools Road and Roads Retaining Structures location in the WB and scope.

## Project 07- HEB- Milling and Overlay of Hebron Internal Roads



Figure 1.19: Project 07- HEB- Milling and Overlay of Hebron Internal Roads Location in the WB.

Project Description	Upgrade approximately 17.7 Km of Hebron Internal Roads. The internal roads are located within the vicinity of the city of Hebron within the Governorate of Hebron. Road works is sited in Area A. The work also includes the construction of Beit Enoon Roundabout at HWY-60. Beit Enoon Junction which links several communities within the governorate of Hebron to Hebron city has been blocked by the Israeli Civil Administration for more than ten years. Upon completing the roundabout, the junction was reopened by COGAT (Coordination of Government Activities in the Territories), facilitating the movement of people and commercials and reducing the travel time by approximately 20 minutes.	
Total Road Length	Original Scope	Milling and overlay of 21.2 km of Hebron internal roads
	Modified Scope	Milling and overlay of 14.42 km Safety Enhancement of 3.27km
	Additional Scope	Beit Enoon roundabout construction
Project Value	\$4,463,760.00	
Modified Project Value	\$4,837,556.28 as per VO#20 Tarifi Contracting Company	
Subcontractor Name		
Start of Construction	June 10, 2013	
Contractual period of Performance	210 Calendar Days	
Contractual End Date	November 10, 2013	
Modified period of Performance	350 Calendar Days	
Modified End Date	March 30, 2014 as per VO#19	
Actual Completion Date	March 30, 2014	
Construction site handover	Hebron internal roads- March 30, 2014. Beit Enoon roundabout and Ein Sara road- March 31, 2014.	
Final Acceptance Certificate	March 30, 2014	
Constructions works	Milling the existing asphalt layer and overlaying a fresh asphalt layer. Work also includes excavation works, patching works, construction of sidewalks, rehabilitation of existing sidewalks, installation of safety features, construction of Beit Enoon Roundabout and any other works needed to complete this project as specified.	
Safety / Furnitures	Road marking, traffic signs and sidewalks.	

## SCOPE OF WORK

### PROJECT 7: Milling and Overlay of Hebron Internal Roads

1- Milling and overlay of 1,964.50 L.m and safety enhancement of 235.40 L.m of Wadi Al Hariya Road.	2,199.90 L.m
2- Milling and overlay of 1,293.80 L.m of Wadi Al Hariya – Al Mashrou’ Road.	1,293.80 L.m
3- Milling and overlay of 1,510.20 L.m of Al Deek Road	1,510.20 L.m
4- Milling and overlay of 1,141.00 L.m of Jabal Johar Road	1,141.00 L.m
5- Milling and overlay of 842.20 L.m and safety enhancement of 831.40 L.m of Wadi Touffah Road	1,673.60 L.m
6- Milling and overlay of 677.70 L.m and safety enhancement of 367.60 L.m of Abu Majnouneh Road	1,045.30 L.m
7- Milling and overlay of 2,240 L.m and safety enhancement of 1,134.20 of Al Salam Road	3,374.20 L.m
8- Milling and overlay of 1,836.40 L.m of Nemra Road	1,836.40 L.m
9- Milling and overlay of 426.30 L.m of Al Menonite Road	426.30 L.m
10-Milling and overlay of 641.70 L.m of University 2 Road	641.70 L.m
11-Milling and overlay of 415.10 L.m -Quds Square Shaheen Road	415.10 L.m
12-Milling and overlay of 361.8 L.m- Bir Al Rahma Shaheen Rd.	361.80 L.m
13-Milling and overlay of 483.70 L.m of Qezon Road	483.70 L.m
14-Milling and overlay of 332.10 L.m and safety enhancement of 705.95 L.m of Al Mezan and Ras Al Jora	1,038.05 L.m
<b>Total</b>	<b>17,441.05 L.m</b>
15- Reconstruction of Beit Enoon Roundabout	
16- Milling and overlay of 252.55 L.m of Ein Sara Road	<b>252.55 L.m</b>
<b>Total overlay = 14.69 km</b>	<b>Total Safety Enhancement= 3.27km</b>



Figure 1.20: Project 07- HEB- Milling and Overlay of Hebron Internal Roads Location in the WB and scope.

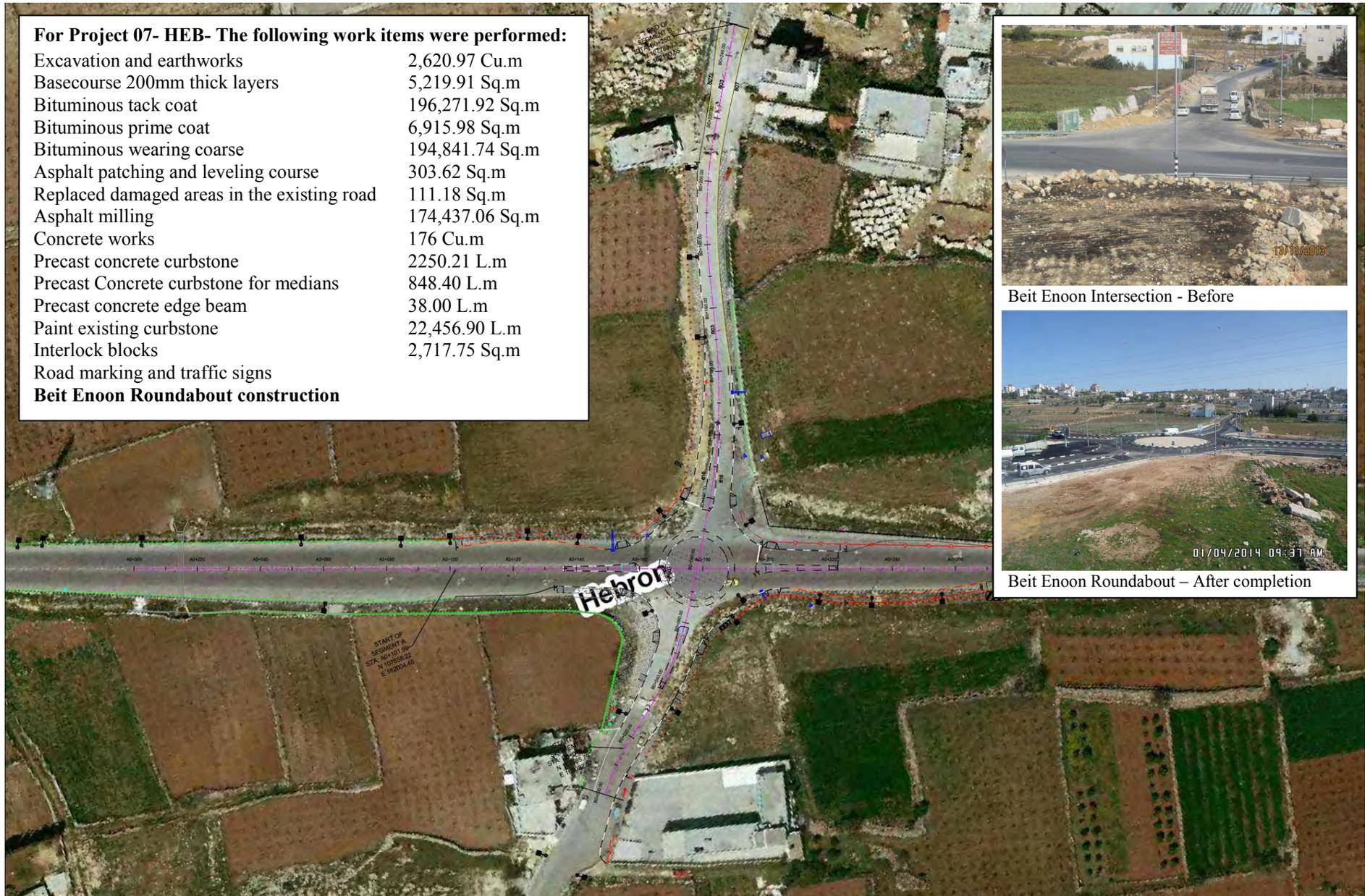


Figure 1.21: Project 07- HEB- Beit Enoon Roundabout Location.

**ROADS SECTOR TASK ORDER CONTRACT INDICATOR 1: Number of kilometers of transportation infrastructure constructed or repaired through USG assistance:**

<b>Project 01- WJA</b>	
WJA - Total Road reconstruction (100% Completed)	2.883 Km
WJA Target value	2.780 Km
WJA Number of kilometers constructed or repaired through end of this project =	<b>2.883 Km</b>
<b>Project 02- WJB</b>	
WJB - Total Road reconstruction (100% Completed)	0.97 Km
WJB Target value	0.99 Km
WJB Number of kilometers constructed or repaired through end of this project =	<b>0.97 Km</b>
<b>Project 03- SSC</b>	
SSC - Total Road reconstruction (100% Completed)	1.297 Km
SSC Target value	1.300 Km
SSC Number of kilometers constructed or repaired through end of this project =	<b>1.297 Km</b>
<b>Project 04- WNV</b>	
WNV - Total Road reconstruction (widening) (100% Completed)	1.00 Km
WNV - Total Road (overlay) (100% Completed)	1.082 Km
WNV - Total Road (milling and safety enhancement) (100% Completed)	0.832 Km
WNV Target value	1.00 Km
WNV Number of kilometers constructed or repaired through end of this project =	<b>1.914 Km</b>
<b>Project 05- QAL</b>	
QAL - Total Safety Enhancement (100% Completed)	2.13 Km
QAL Target value	1.40 Km
QAL Number of kilometers constructed or repaired through end of this project =	<b>2.13 Km</b>
<b>Project 06- THR</b>	
THR - Total Road reconstruction (100% Completed)	1.665 Km
THR Target value	3.00 Km
THR Number of kilometers constructed or repaired through end of this project =	<b>1.665 Km</b>
<b>Project 07- HEB</b>	
HEB - Total Road (overlay) (100% Completed)	14.42Km
HEB- Total Road Safety Enhancement (100% Completed)	3.27Km
HEB Target value	21.20 Km
HEB Number of kilometers constructed or repaired through end of this project =	<b>17.69Km</b>

## WORKING / NON-WORKING DAYS

### Project 01-WJA

1	Total Period of Performance (Original)	210
2	Total Excusable delays/approved extensions	40
3	Modified Period of Performance	250
4	Modified Completion Date	December 20, 2013
5	Accumulated Working Days	207
6	Accumulated non-working days (Holidays and weekends)	43
7	Accumulated other non-working days	6

### Project 02-WJB

1	Total Period of Performance (Original)	150
2	Total Excusable delays/approved extensions	31
3	Modified Period of Performance	181
4	Modified Completion Date	October 12, 2013
5	Accumulated Working Days	151
6	Accumulated non-working days (Holidays and weekends)	30
7	Accumulated other non-working days	0

### Project 03-SSC

1	Total Period of Performance (Original)	180
2	Total Excusable delays/approved extensions	72
3	Modified Period of Performance	252
4	Modified Completion Date	December 22, 2013
5	Accumulated Working Days	188
6	Accumulated non-working days (Holidays and weekends)	44
7	Accumulated other non-working days	21

### Project 04-WNV

1	Total Period of Performance (Original)	150
2	Total Excusable delays/approved extensions	28
3	Modified Period of Performance	178
4	Modified Completion Date	October 09 , 2013
5	Accumulated Working Days	149
6	Accumulated non-working days (Holidays and weekends)	29
7	Accumulated other non-working days	0

### Project 05-QAL

1	Total Period of Performance (Original)	120
2	Total Excusable delays/approved extensions	14
3	Modified Period of Performance	134

4	Modified Completion Date	August 26, 2013
5	Accumulated Working Days	72
6	Accumulated non-working days (Holidays and weekends)	23
7	Accumulated other non-working days	30

#### **Project 06-THR**

1	Total Period of Performance (Original)	180
2	Total Excusable delays/approved extensions	21
3	Modified Period of Performance	201
4	Modified Completion Date	November 01, 2013
5	Accumulated Working Days	164
6	Accumulated non-working days (Holidays and weekends)	37
7	Accumulated other non-working days	0

#### **Project 07-HEB**

1	Total Period of Performance (Original)	210
2	Total Excusable delays/approved extensions	140
3	Modified Period of Performance	350
4	Modified Completion Date	March 30, 2014
5	Accumulated Working Days	270
6	Accumulated non-working days (Holidays and weekends)	58
7	Accumulated other non-working days	22

### **ROAD TYPICAL CROSS SECTIONS**

Shop drawings (plans, profiles and typical cross sections) were prepared for the 7 road projects and submitted to CMC for Approval. After the project completion as built drawings were prepared and approved. Please refer to approved As Built Drawings submittals listed below for more details:

Project 01: Wadi Al Jeer–Al Sawahira Al Sharqiya (Segment A)	SUB-13-00004-WJA-393-B
Project 02: Wadi Al Jeer–Al Sawahira Al Sharqiya (Segment B)	SUB-13-00004-WJB-335-B
Project 03: Al Sawahira Al Sharqiya-Sheikh Sa’ed Road (Segment C)	SUB-13-00004-SSC-392-B
Project 04: Wadi Al Nar Road (Segment V)	SUB-13-00004-WNV-334-B
Project 05: Qalandiya-Jabaa Road Safety Enhancement	SUB-13-00004-QAL-299-C
Project 06: Al Thirwa Schools Road and Roads Retaining Structures	SUB-13-00004-THR-379-B SUB-13-00004-THR-380-B SUB-13-00004-THR-383-A SUB-13-00004-THR-384-A
Project 07: Milling and Overlay of Hebron Internal Roads	SUB-13-00004-HEB-397-B SUB-13-00004-HEB-398-B

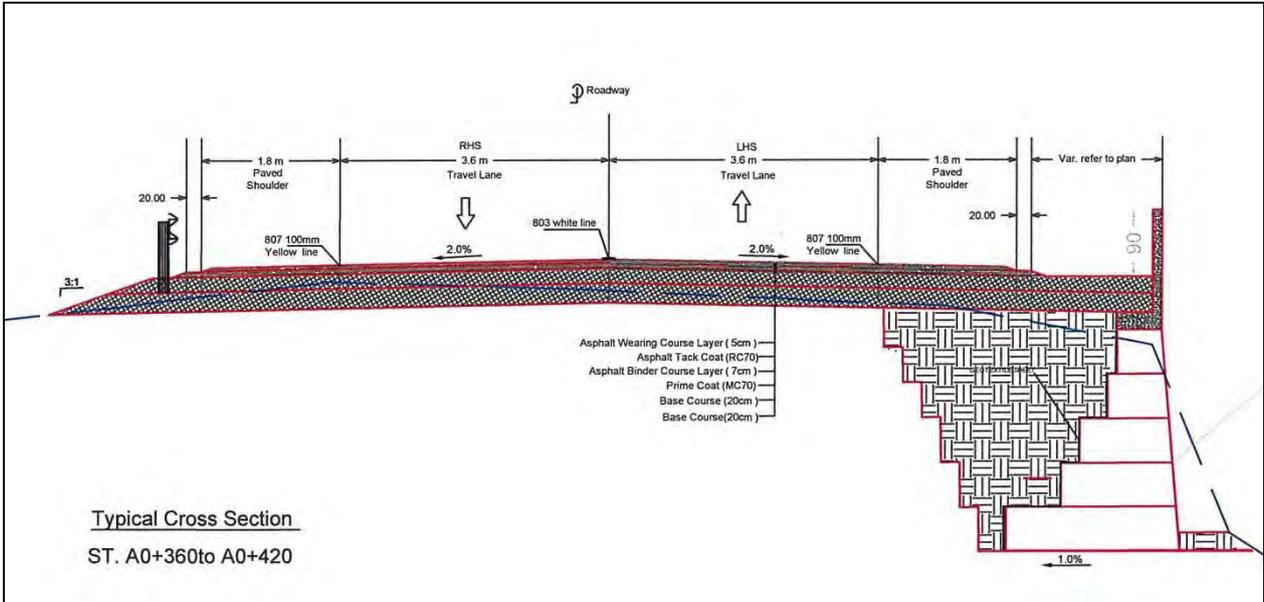


Figure 1.22: Project 01- WJA- Typical cross section from St. A0+360 to St. A0+420.

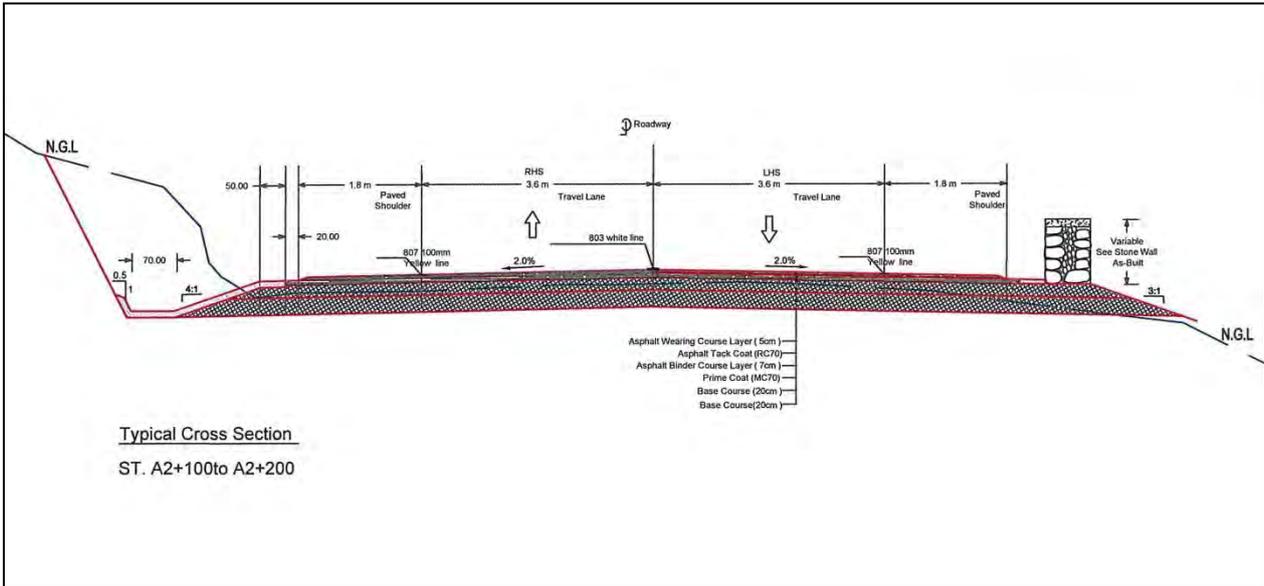


Figure 1.23: Project 01- WJA- Typical cross section from St. A2+100 to St. A2+200.

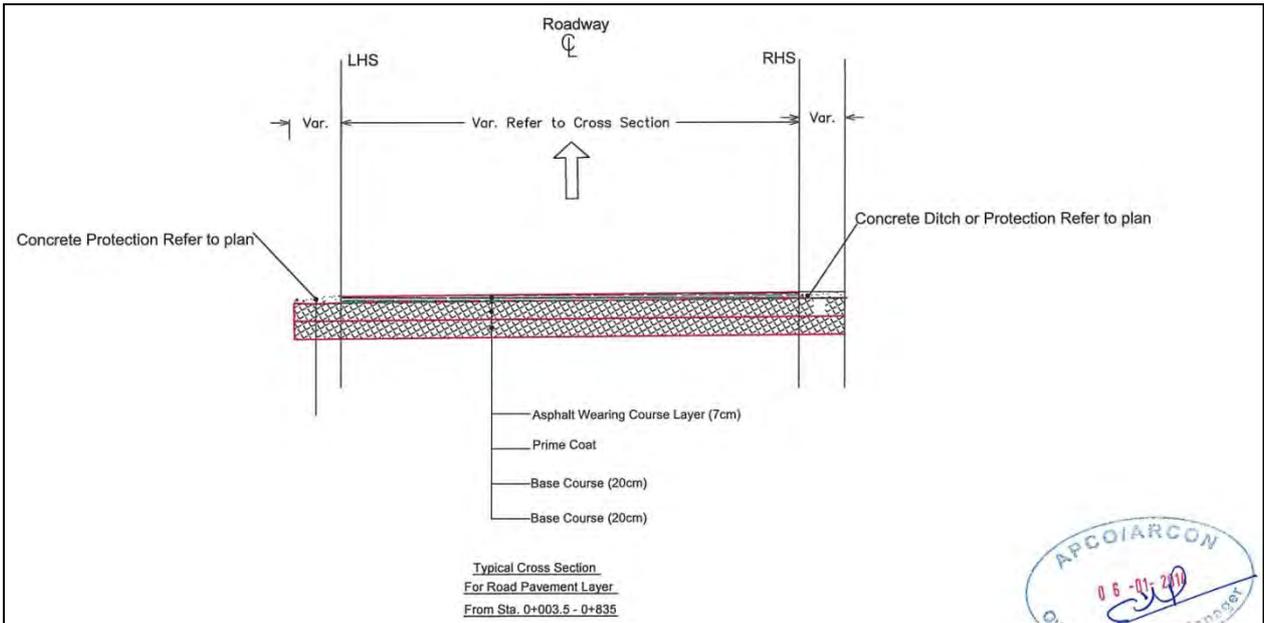


Figure 1.24: Project 02- WJB- Typical cross section from St. 0+003 to St. 0+835.



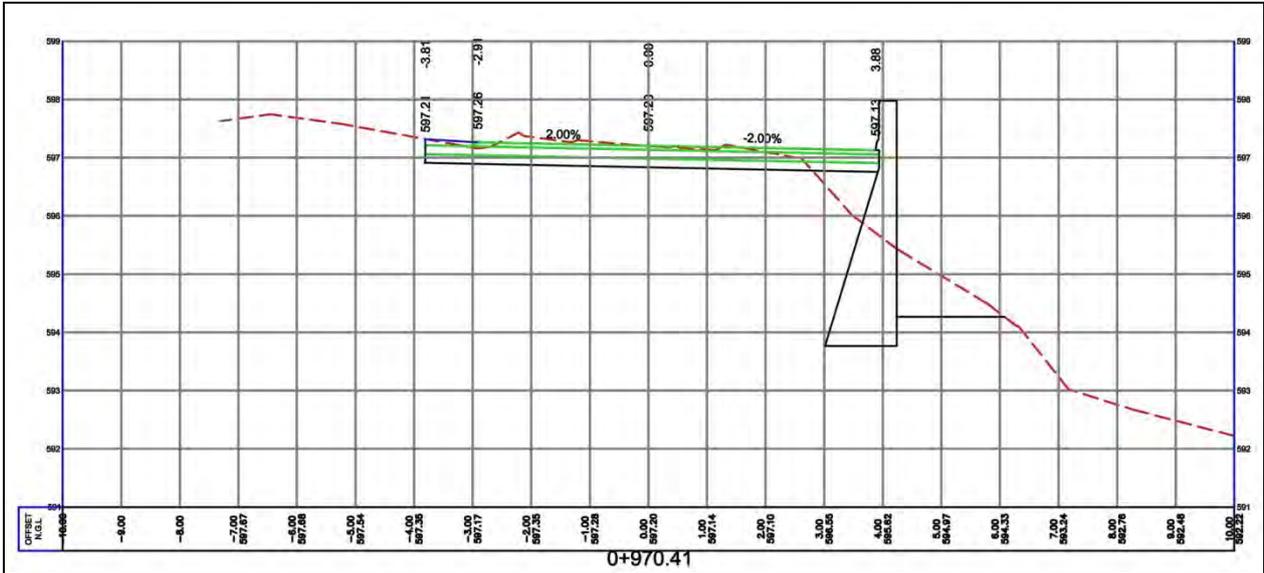


Figure 1.28: Project 03- SSC- Typical cross section at St. 0+970.41.

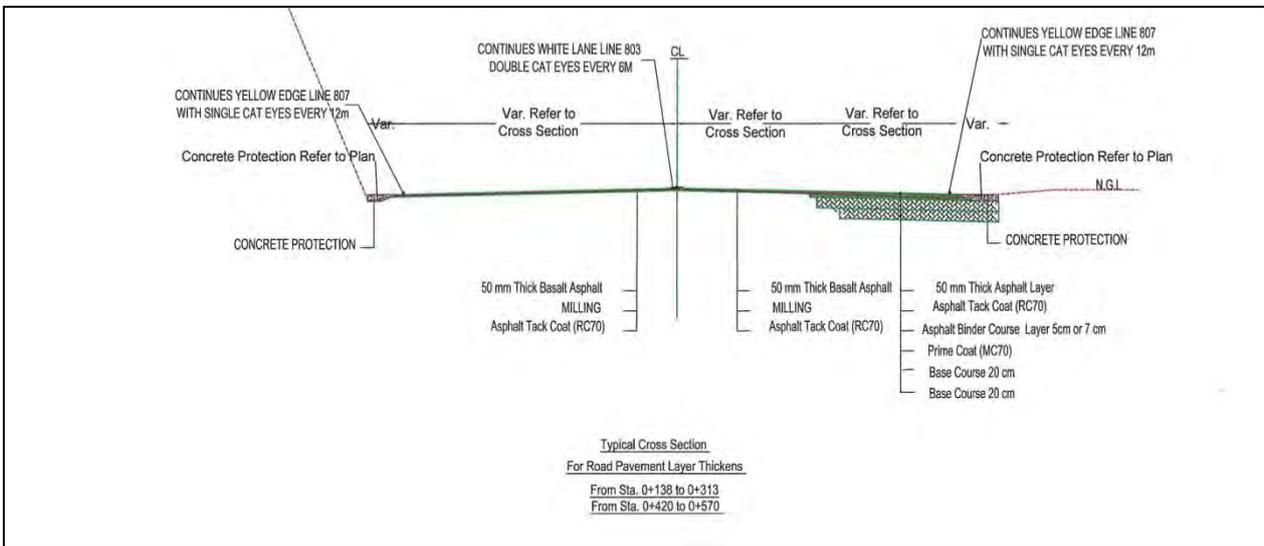


Figure 1.29: Project 04- WNV- Typical cross section from St. 0+138 to St. 0+313 and from St. 0+420 to St. 0+570.

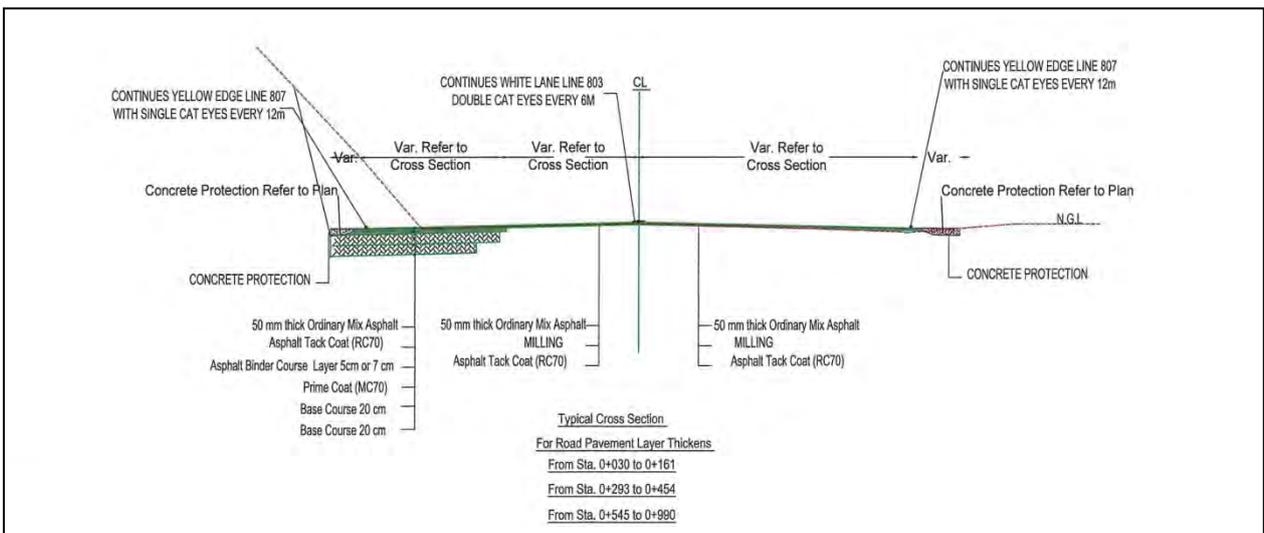


Figure 1.30: Project 04- WNV- Typical cross section from St. 0+030 to St. 0+161, from St. 0+293 to St. 0+454 and from St. 0+545 to St. 0+990.



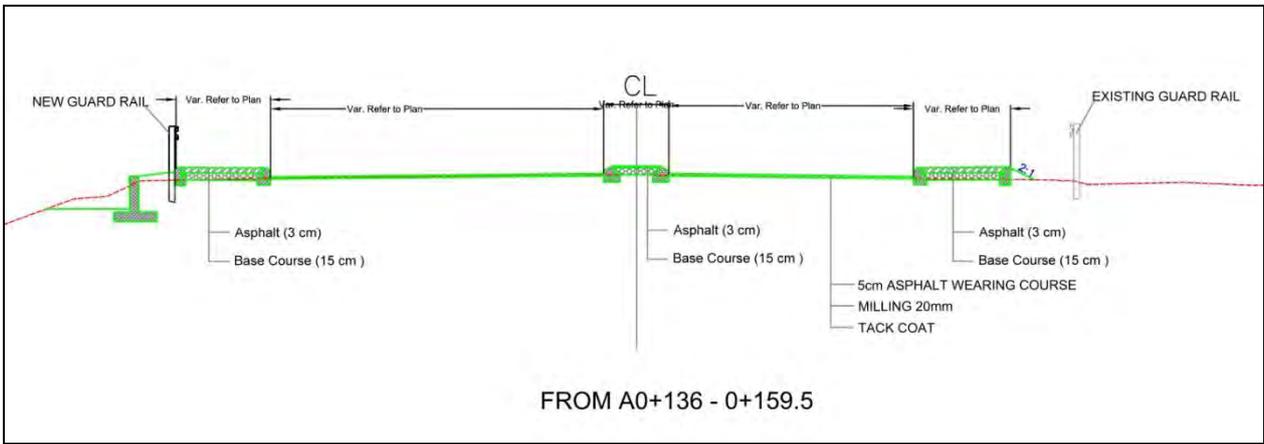


Figure 1.34: Project 07- HEB- Beit Nooon- Segment A- Typical cross section from St. A0+136 to St. A0+159.5.

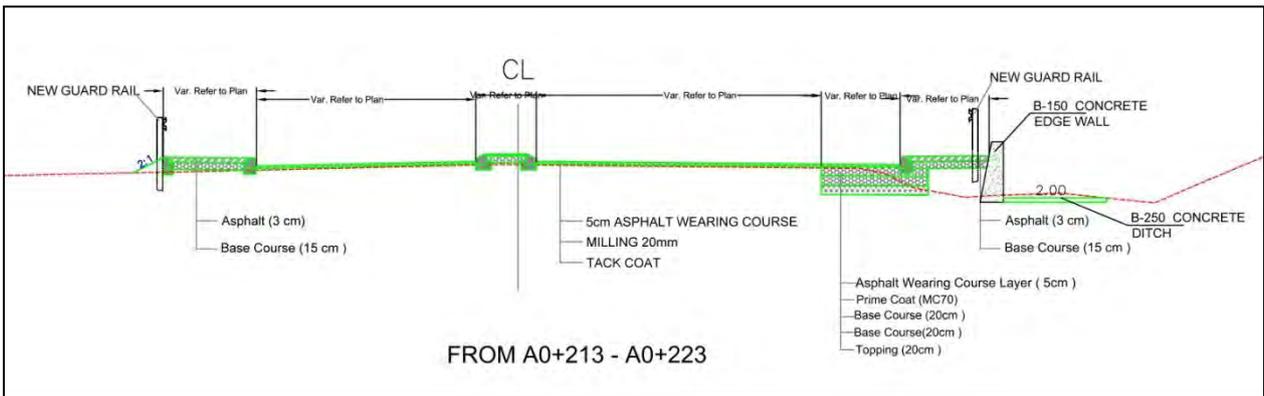


Figure 1.35: Project 07- HEB- Beit Nooon- Segment A- Typical cross section from St. A0+213 to St. A0+223.

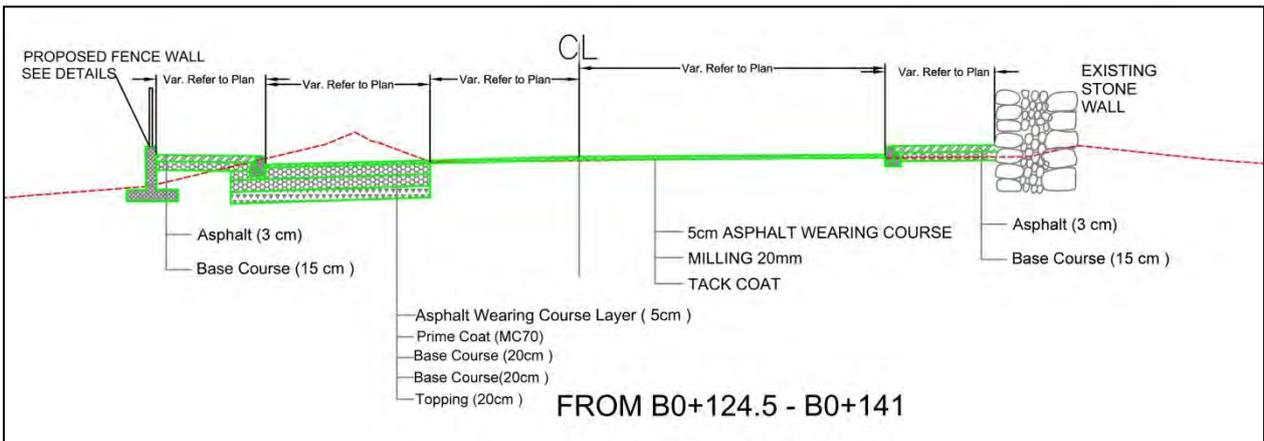


Figure 1.36: Project 07- HEB- Beit Nooon- Segment B- Typical cross section from St. B0+124.5 to St. B0+141

## KEY PERSONNEL

Key personnel listed below were all approved by the USAID's COR after checking their qualifications. Most have had key positions on multiple task orders working on INP-I under prime contractors making them very familiar with USAID procedure, and fully understand the quality, safety and compliance standards demanded by USAID. They have been specifically selected for their abilities and experience to suit the given position.

All are degreed civil engineers, with many years of similar local road construction experience, management of local subcontractors, knowledge of local resources; all are versed in the English language.

While the experience and credentials of each key person was very critical to suit the given individual task, the authority delegated to each was of equal importance. APCO key personnel were empowered to have full control of the site, the subcontractors, manage resources, and make financial decisions in the best interest of the project. Following is a brief narrative of T.O 13-00004 key personnel and their position.

<u>Position</u>	<u>Name</u>	<u>Approval Date</u>	<u>Start Date</u>	<u>End Date</u>
Task Order Manager	Mahmoud Jaradat	April 26, 2013	May 01, 2014	March 31, 2014
Quality Control Manager	Zuhair Ghayadah	April 26, 2013	May 04, 2014	Dec. 21, 2013
Temporary Q.C.M	Islam Fakhouri	Dec. 21, 2013	Dec. 22, 2013	March 31, 2014
Safety And Environmental Compliance Officer	Ahmad Najajreh	April 26, 2013	May 02, 2014	Feb. 27, 2014
Project Manager for Project 01	Sami Awadeh	April 26, 2013	May 04, 2014	Dec. 20, 2013
Project Manager for Project 02	Mohammad Al Dwaib	April 26, 2013	May 04, 2014	Oct. 02, 2013
Project Manager for Project 03	Romel Shalaldeh	April 26, 2013	May 07, 2014	Dec. 22, 2013
Project Manager for Project 04	Yousif Abu Lawi	April 26, 2013	May 07, 2014	Oct. 15, 2013
Project Manager for Project 05	Ibrahem Hinde	April 26, 2013	May 01, 2014	May 30, 2013
	Mai Haddad	May 30, 2013	June 01, 2013	Aug. 26, 2013
Project Manager for Project 06	Motasem Abu Rayyan	April 26, 2013	April 26, 2013	Nov. 01, 2013
Project Manager for Project 07	Ibrahim Hinde	May 30, 2013	June 01, 2013	June 25, 2013
	Turki Abu Sneineh	June 25, 2013	June 25, 2013	March 31, 2014

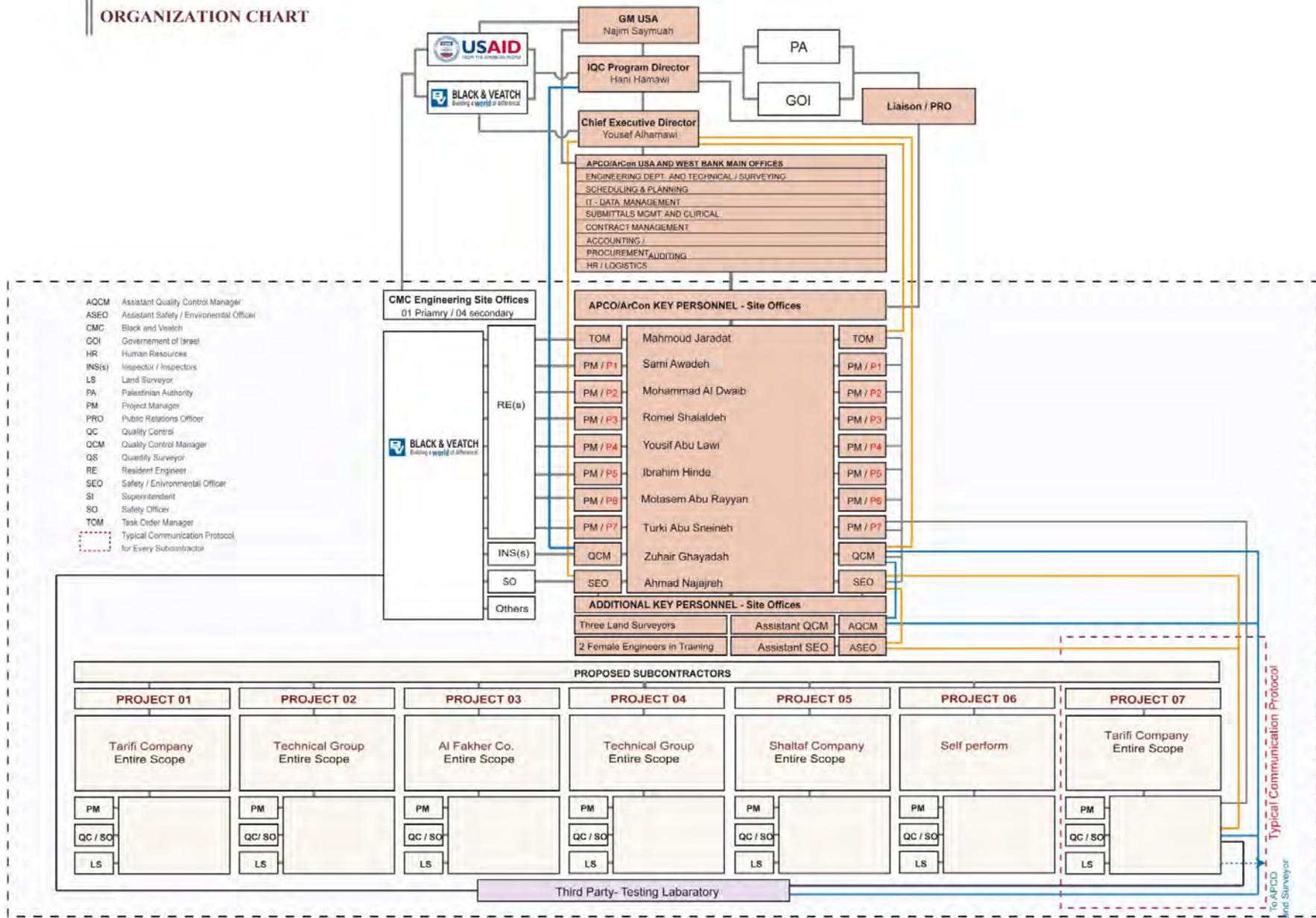
## ADDITIONAL KEY PERSONNEL

Assistant Safety Manager	Ayed Natour
Assistant Quality Control Manager	Mahmoud Najajreh
Land Surveyor – 1	Hadi Wreidat
Land Surveyor – 2	Rashed Sarhan
Quantity Surveyor	Rami Abu Keshek
Entry Level – 1 (Female Engineer in Training)	Mai Haddad
Entry Level – 2 (Female Engineer in Training)	Michleen Rishmawi

Further; full back up and support was provided to the assigned key personnel by the following senior APCO/ArCon staff as shown in the attached project's organization chart.

Liaison / Public Relation	: Ashraf Kalafawi
Chief Executive Director	: Yousef Al Hamawi
IQC Program Director	: Hani Hamawi.
APCO/ ArCon USA General Manager	: Najim Saymouah

# ORGANIZATION CHART



## **SUBCONTRACTOR**

**4 major subcontractors** were engaged to perform 6 road projects as detailed below and the 7<sup>th</sup> project was self-performed by APCO/ArCon.

**PROJECT 01: Wadi Al Jeer–Al Sawahira Al Sharqiya Road (Segment A)**

**PROJECT 07: Milling and Overlay of Hebron Internal Roads**

### **MAJOR SUBCONTRACTOR:**

#### **AL TARIFI CONTRACTING AND RECONSTRUCTION CO (TCR)**

Legal Name: Al Tarifi Contracting and Reconstruction Co. (TCR)  
Registration: Palestinian Contractors Union  
Classification: First Class A – Roads, First Class B – Buildings  
Year Established: 1950 (62 years continuous history)  
Field of Experience: Roads, Water, Wastewater, and Buildings

**PROJECT 07: Beit Enoon Roundabout- Specialty Subcontractor**

#### **AL NAMMOURA CONTRACTING COMPANY**

**PROJECT 02: Wadi Al Jeer–Al Sawahira Al Sharqiya Road (Segment B)**

**PROJECT 04: Wadi Al Nar Road (Segment V)**

### **MAJOR SUBCONTRACTOR:**

#### **TECHNICAL GROUP COMPANY**

Legal Name: Technical Group Company for General Contracting  
Registration: 563119122  
Classification: 1<sup>st</sup> B Roads, 1st Buildings, 1<sup>st</sup> Wastewater  
Year Established: 1988 (24 years continuous history)  
Field of Experience: Roads, Wastewater, and Buildings

**PROJECT 03: Al Sawahira Al Sharqiya-Sheikh Sa’ed Road (Segment C)**

### **MAJOR SUBCONTRACTOR:**

#### **AL-FAKHER GENERAL CONTRACTING COMPANY**

Legal Name: Al-Fakher General Contracting Company  
Registration: Palestinian Contractor Union No. 562459123  
Classification: Class 2 Water/Wastewater  
Year Established: 2001 (11 year history)  
Field of Experience: Water, Wastewater, Roads, Buildings

**PROJECT 05: Qalandiya - Jabaa Road Safety Enhancement**

### **MAJOR SUBCONTRACTOR:**

#### **SHALTAF GENERAL CONTRACTING CO. (SGC)**

Legal Name: Shaltaf General Contracting Company  
Registration: Palestinian Contractors Union  
Classification: First Class A Roads; First Class A Buildings  
Year Established: 1986 (in continuous operation)  
Field of Experience: Roads, Water, Wastewater, and Buildings

**PROJECT 06: Al Thirwa Schools Road and Roads Retaining Structures**

This project was self-performed by APCO/ArCon incorporating three subcontractors (Al Fakher Company, Al Sadek Company and Al Tafawouq Company).

## PROJECT OUTCOMES

<u>Project Name</u>	<u>Impact</u>	<u>Performance Indicator *</u>
<b>Project 01 (WJA)</b>	Substantially improved travel conditions between the West Bank's northern and southern districts and facilitated the movement of people and goods.	Total number of people trips per year=2695160
<b>Project 02 (WJB)</b>	Similar to Segment A this road is an integral part of a route connecting the West Bank's northern and southern districts, its reconstruction improved travel conditions and facilitated the movement of people and goods.	Total number of people trips per year=134,7580
<b>Project 03 (SSC)</b>	This road project facilitated the movement of locals between the town of Al Sawahira Al Sharqiya and the community of Sheikh Sa'ed in the Governorate of Jerusalem.	Total population of Al Sawahira Al Sharqiya and the community of Sheikh Sa'ed = 8,743 person.
<b>Project 04 (WNV)</b>	Regional road serving commercial and residential traffic in Governorate of Bethlehem (mid-south region of west Bank) connects Bethlehem with Jerusalem and serves as the primary road for all commercial and residential traffic travelling between the northern and southern West Bank.	Total number of people trips per year=2695160
<b>Project 05 (QAL)</b>	Arterial road serves as the primary thoroughfare for all commercial and residential traffic between Ramallah and southern West Bank. This road improved travel conditions between the West Bank's northern and southern districts and facilitated the movement of people and goods.	---
<b>Project 06 (THR)</b>	Rehabilitation of internal roads are located within the vicinity of the city of Halhul substantially improved travel conditions, and made the area conducive to investment by facilitating the movement of people and goods.	Total population of Halhul City = 27,421 person.
<b>Project 07 (HEB)</b>	Rehabilitation of internal roads are located within the vicinity of the city of Hebron substantially improved travel conditions, and made each area conducive to investment by facilitating the movement of people and goods.	Total population of Hebron = 202,172 person.
<b>Beit Enoon Roundabout</b>	Beit Enoon roundabout links several communities within the governorate of Hebron to Hebron city and complement USAID's investment in Hebron internal roads. The roundabout will reduce the travel time and will facilitate the movement of commerce to and from the city of Hebron, contributing the boosting the economic growth.	Reduce travel time by 20 minutes.

\* Statistics source is the Palestinian Central Bureau of Statistics "PCBS" and USAID.



Figure 1.37: Before- Students leaving school and crossing a high speed highway unsafely at Beit Enon - Hebron



Figure 1.38: After- Beit Enon Roundabout enhanced safety and provided safe access (road crossings and median) for the school students.

## INDICATOR NO. 2: GENERATED PERSON-DAYS OF EMPLOYMENT:

(Please note totals are rounded to the nearest man-day)

The difference between the targeted and the actual man-days is attributed to the following factors:

- 1- The target estimates is always subject to variation depending on actual conditions including weather and length of work shifts.
- 2- The productivity rate during the last months of each project was much higher than earlier months due to extended hours that limited the delay hours required for mobilization/ demobilization.

### Task Order (MRS)

- Target value= **40,399** Man-Days
- Total cumulative employment generated = **26,119** Man-Days

#### Project 1:

- Target value= **6,811** Man-Days
- Total cumulative employment generated = **4,296** Man-Days

#### Project 2

- Target value= **2,962** Man-Days
- Total cumulative employment generated = **2,524** Man-Days

#### Project 3:

- Target value= **4,764** Man-Days
- Total cumulative employment generated = **4,155** Man-Days

#### Project 4

- Target value= **3,286** Man-Days
- Total cumulative employment generated = **1,677** Man-Days

#### Project 5

- Target value= **1,286** Man-Days
- Total cumulative employment generated = **623** Man-Days

#### Project 6:

- Target value= **6,198** Man-Days
- Total cumulative employment generated= **4,928** Man-Days

#### Project 7:

- Target value= **15,093**Man-Days
- Total cumulative employment generated= **7,915** Man-Days

<b>Total Job Days</b>	<b>No. of Full Time Equivalent (FTE) Jobs =</b> (Total Job Days / 23.8)
Total generated = <b>26,119</b> Man-days	Total generated = <b>1,097</b>

## COMMUNITY OUTREACH

APCO/ArCon invested during projects construction in community outreach and public relation, to increase public and local council awareness about USAID mission and investment in the West Bank, achieve an understanding and cooperation from all parties and stakeholders involved and maximize safety and target outcomes.

After the NTP and during April and May 2013 Joint visits / coordination meetings with CMC, Ministry of Public Works and Housing representatives (MOPWH) and APCO/ArCon were conducted at Hebron Municipality, Al Sawahra Al Sharqiya Local Council, Halhoul Municipality, Al Obeidiya Municipality, and Al Shiekh Saad Local Council. Issues discussed as follow:

- 1- Introduce APCO/ArCon and CMC field team and contact persons.
- 2- Introduce Local Council / Municipality engineer and contact persons.
- 3- Describe project scope of work under the USAID INPII program.
- 4- Discuss the existing utilities and requesting As Built drawings for underground utilities.
- 5- Discuss topics of special concern by the local council.
- 6- Describe the contractor's project work plan / phases.
- 7- Discuss the traffic control plan and availability of detour roads.
- 8- Presenting APCO/ArCon public relation officer.

Proposed Flyers for the 7 projects were approved by USAID. Flyers were distributed to the public prior to starting the field works.

During project duration community outreach activities conducted as the followings:

Distribution of informative flyers for each project continued to be handed out to councils, residents and motorists. Contents of flyers were approved by USAID and explained project funding, scope, detours and each project duration.

Radio announcement for Project 04 on local station FM 103.4- Ajyal radio- Ramallah for three days (June 04, 05 and 06<sup>th</sup>), six times a day as follow: 7:00AM, 10:00AM, 1:00PM, 3:00PM, 5:00PM, and 8:00PM.

A meeting with Public Transportation Drivers was conducted by APCO's T.O.M and public relations officer at Abu Dees main taxi parking area, the aim of the meeting was to inform them about the proposed temporary detours and the required safety measures.

Because projects 01 and 02 affect access to Al Quds University a meeting with university director was conducted by APCO's T.O.M and public relations officer, the director was briefed on the projects scope, traffic control plans, available detours and other topics of special concern. In addition, APCO/ArCon offered training for civil engineering students from Al Quds University (projects 01 and 02- close proximity to university) however; the director welcomed the opportunity but indicated that Al Quds does not offer civil and architectural curriculums.



Figure 1.39: copies of projects 01 and 02 flyer were handed to Al Sawahreh local council.



Figure 1.40: Meeting with public transportation drivers at Abu Dees Parking Area.

APCO public relations personnel also reached out to local women from Al Sawahreh Al Sharqyieh, Al ObeidyeH town and Hebron city at their houses and local councils for the purpose of informing and educating them about the importance of safety and how they should communicate to their children this awareness. Emergency telephone numbers were provided and our personnel handed First Aid kits to all attendees.

The start of new school year required more attention to safety because students were walking to school through or around construction area; therefore, it was important to make school administration, students and parents aware of construction activities to maximize safety of students. APCO/ArCon safety and environmental compliance officer conducted a special orientation to school administration and students at the nearby Halhul girls school campus.

An overview of the construction activities and schedule were presented, and instructions as well as recommendations on how to safely navigate crossings around construction zones were explained, also, contact information were exchanged with school administration for continuous coordination and cooptation.

During the month of Ramadan 2013 APCO/ArCon hosted “Iftar dinner” for approximately 100 orphans from Hebron charitble organization located near project 07.



Figure 1.41: Meetings with local women at al Sawahreh and Al ObeidyeH towns.



Figure 1.42: Safety Toolbox talk at Halhul Girls School.



Figures 1.43 and 1.44: Ramadan Iftar for orphans from Hebron charitble organization.

In September 2013, APCOArCon participated in an “Employment day” event held by the International Youth Foundation (IYF). This event is part of Youth Entrepreneurship Development program funded by USAID. APCO/ArCon representatives interviewed Polytechnic University students from different professions, and selected 6 females including two with special needs to be trained and employed as an (Entry Level) on APCO’s newly awarded Task Orders.



Figures 1.45 and 1.46: APCOArCon participation in an “Employment day” event held by the International Youth Foundation (IYF) - Hebron.

In March 2014 a safety toolbox talk was conducted at Omar Ibn Al Aziz Girls School near Beit Enoon roundabout about the construction works at the roundabout and students safety when entering and leaving the school (especially during sidewalk asphalt works in front of the school).



Figures 1.47 and 1.48: Safety Toolbox talk at Omar Ibn Al Aziz Girls School near Beit Enoon roundabout.

### **GENDER CONSIDERATION:**

Three female engineers were employed in the field offices.  
Sanitary facilities for males and females were provided at site.

## 2 | WORK PROGRESS

# WORK PROGRESS

## Project 1: Wadi Al Jeer–Al Sawahira Al Sharqiya Road (Segment A)

Construction on the project commenced on May 26, 2013. During the construction period, delays and obstructions occurred due to delay in obtaining approval for traffic control plan from DCL, unsuitable sub-grade material replacement, landowners’ objections on R.O.W, road alignment, excavation works and sub-grade width, and curbstone installation, design changes, additional scope / work, relocation of existing utilities, managing heavy traffic, severe snow weather and delay in shipping from Europe of street light fixtures. *All these delays are detailed under Section 03 in this report.*

The delays were largely mitigated by working on holidays, additional hours, night shifts and by utilizing additional workforce, however time extensions were necessary.

The completion date was modified three times for this project (40 days time extension to cover excusable delays) extending the completion date to Dec. 20, 2013. The project was fully completed on Dec. 26, 2013. Site Handover and final walkthrough was conducted on Dec. 30, 2013.

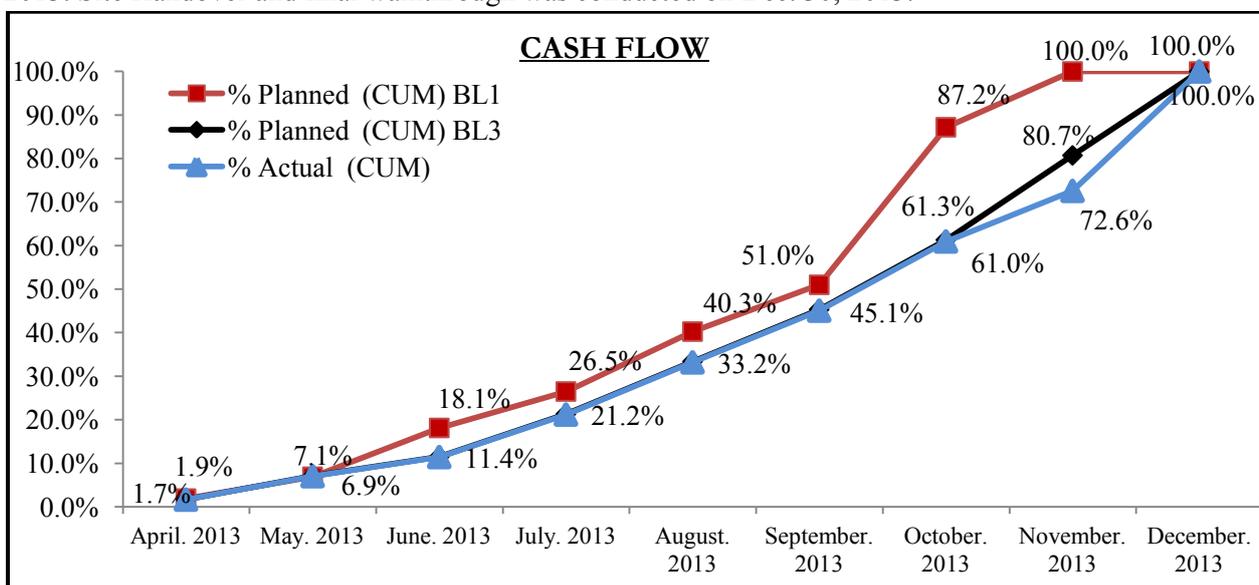


Figure 2.1: Wadi Al Jeer–Al Sawahira Al Sharqiya Road (Segment A) Construction Works Progress – S-curve

The following table summarizes the progress in the construction works of the project:

Table 2.1: Project 01- Wadi Al Jeer–Al Sawahira Al Sharqiya Road (Segment A) Progress

Date	Actual Completion Percentage	Planned Completion Percentage (Baseline 01)	Comments
April 2013	1.7%	1.9%	
May 2013	6.9%	7.1%	
June 2013	11.4%	18.1%	
July 2013	21.2%	26.5%	
August 2013	33.2%	40.3%	21 days time extension per VO#03
September 2013	45.1%	51.0%	14 days time extension per VO#06
October 2013	61.0%	87.2%	
November 2013	72.6%	100%	
December 2013	100%	100%	5 days time extension per VO#12
			Dec. 26, 2013 <b>Final acceptance certificate</b>

**Project 02: Wadi Al Jeer–Al Sawahira Al Sharqiya (Segment B)**

Construction on the project commenced on June 04, 2013. During the construction period, delays and obstructions occurred due to delay in obtaining approval for traffic control plan from DCL, unsuitable sub-grade material replacement, landowners’ objections on R.O.W, additional scope, relocation of existing utilities, and severe snow weather. *All these delays are detailed under Section 03 in this report.*

The delays were largely mitigated by working on holidays, additional hours, night shifts and by utilizing additional workforce, however time extensions were necessary.

The completion date was modified two times for this project (31 days time extension to cover excusable delays) extending the completion date to October 12, 2013. The project was fully completed on Oct. 07, 2013. Site Handover and final walkthrough was conducted on Oct. 07, 2013.

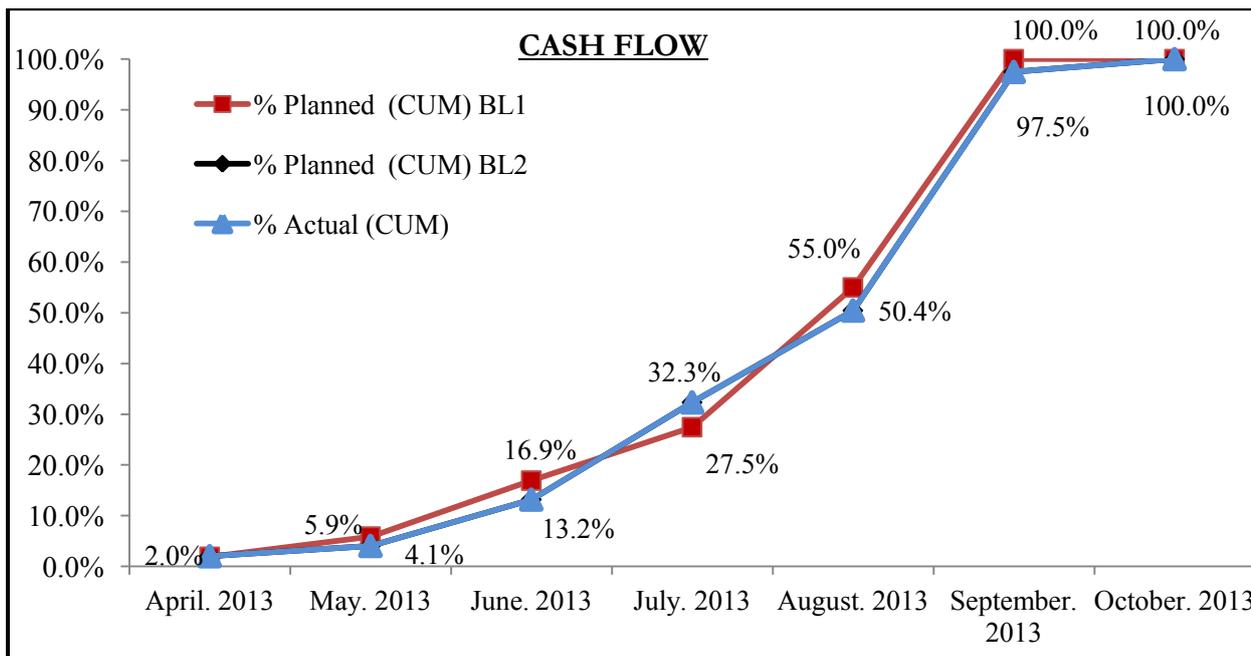


Figure 2.2: Wadi Al Jeer–Al Sawahira Al Sharqiya Road (Segment B) Construction Works Progress – S-curve

The following table summarizes the progress in the construction works of the project:

Table 2.2: Project 02- Wadi Al Jeer–Al Sawahira Al Sharqiya Road (Segment B) Progress

Date	Actual Completion Percentage	Planned Completion Percentage (Baseline 01)	Comments
April 2013	2.0%	2.0%	
May 2013	4.1%	5.9%	
June 2013	13.2%	16.9%	
July 2013	27.5%	32.3%	
August 2013	50.4%	55.0%	21 days time extension per VO#03
September 2013	97.5%	100%	10 days time extension per VO#06
October 2013	100%	100%	October 07, 2013 <b>Final acceptance certificate</b>

### Project 03: Al Sawahira Al Sharqiya-Sheikh Sa'ed Road (Segment C)

Construction on the project commenced on May 28, 2013. During the construction period, delays and obstructions occurred due to landowners' objections on R.O.W, relocation of olive trees, road widening, asphalt works and concrete protection works. Other delays occurred due to discovery of 2 caves and a Romanian well, replacement of unsuitable sub-grade material, design changes and additional work (replacement of triple pipe culvert with 2 cell box culvert, existing asbestos containing culvert encasement, new 4" water pipeline, replacement of existing sewer pipelines, and shifting centerline), challenges in traffic control plan implementation, challenging construction of box culvert at St. C0+130, existing utilities relocation and other issues. *All these delays are detailed under Section 03 in this report.*

The delays were largely mitigated by working on holidays, additional hours, night shifts and by utilizing additional workforce, however time extensions were necessary.

The completion date was modified five times for this project (72 days time extension to cover excusable delays) extending the completion date to Dec. 22, 2013. The project was fully completed on Dec. 23, 2013. Site Handover and final walkthrough was conducted on Dec. 30, 2013.

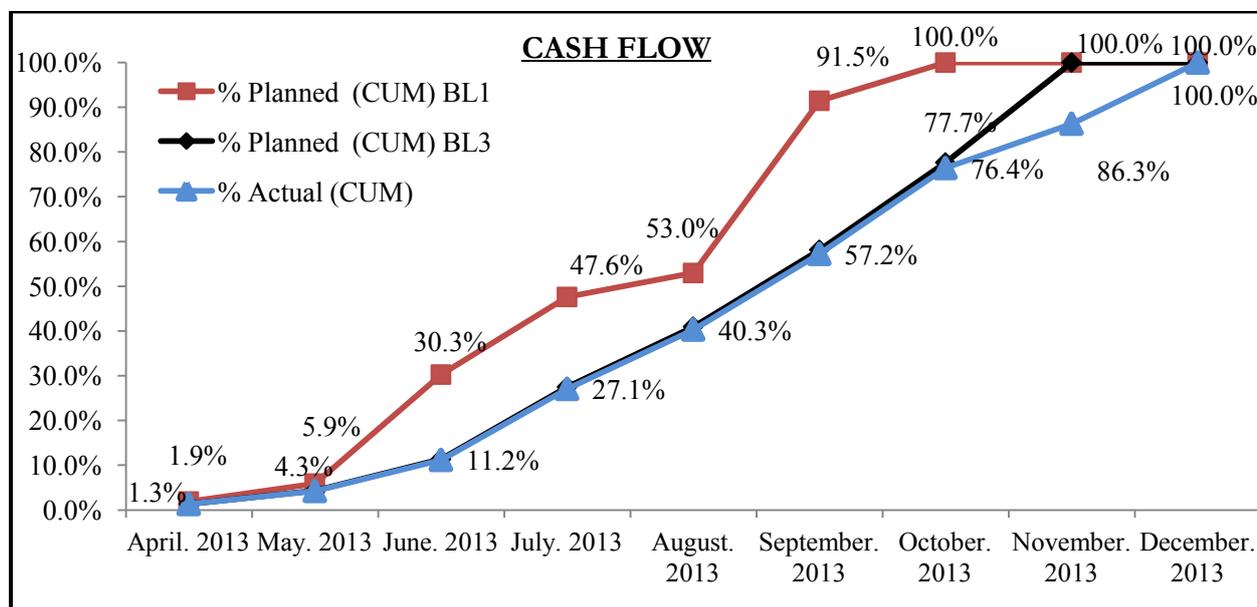


Figure 2.3: Al Sawahira Al Sharqiya-Sheikh Sa'ed Road (Segment C) Construction Works Progress – S-curve

The following table summarizes the progress in the construction works of the project:

Date	Actual Completion Percentage	Planned Completion Percentage (Baseline 01)	Comments
April 2013	1.3%	1.9%	
May 2013	4.3%	5.9%	
June 2013	11.2%	30.3%	
July 2013	27.1%	47.6%	25 days time extension per VO#02
August 2013	40.3%	53.0%	21 days time extension per VO#03
September 2013	57.2%	91.5%	
October 2013	76.4%	100%	
November 2013	86.3%	100%	7 days time extension per VO#10
December 2013	100%	100%	19 days time extension per VOs #11 and 12
			Dec. 23, 2013 <b>Final acceptance certificate</b>

### Project 04: Wadi Al Nar Road (Segment V)

Construction on the project commenced on May 21, 2013. During the construction period, obstructions and works delays occurred due to challenges in managing construction activities and heavy traffic in very steep slopes area within a major thoroughfare connecting the middle and southern governorates in the West Bank, existing underground sewer lines and new installed fiber optic line by PALTEL, existing solar light poles relocation, and danger and hazards presented by high cliffs and residences over work area. *All these obstructions and delays are detailed under Section 03 in this report.*

The delays were largely mitigated by working on holidays, additional hours, night shifts and by utilizing additional workforce, however time extensions were necessary.

The completion date was modified two times for this project (28 days time extension to cover excusable delays) extending the completion date to Oct. 07, 2013. The project was fully completed on Oct. 07, 2013. Site Handover and final walkthrough was conducted on Oct. 07, 2013.

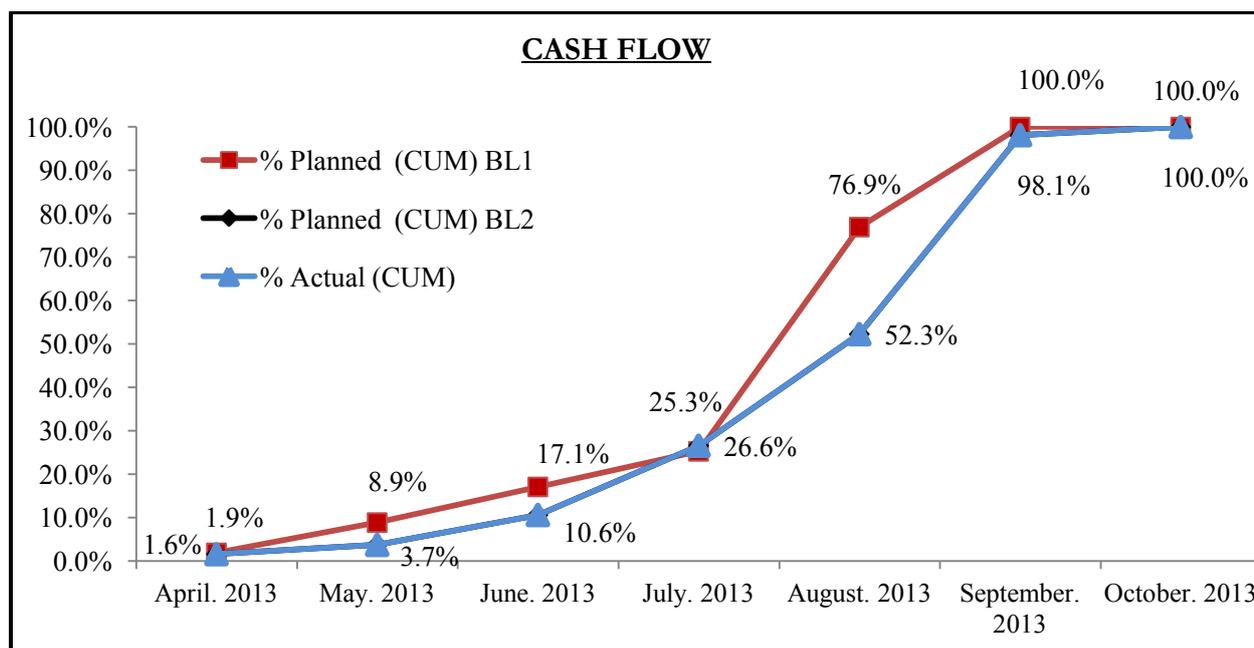


Figure 2.4: Wadi Al Nar Road (Segment V) Works Progress – S-curve

The following table summarizes the progress in the construction works of the project:

Table 2.4: Project 04- Wadi Al Nar Road (Segment V) Progress

Date	Actual Completion Percentage	Planned Completion Percentage (Baseline 01)	Comments
April 2013	1.6%	1.9%	
May 2013	3.7%	8.9%	
June 2013	10.6%	17.1%	
July 2013	26.6%	25.3%	
August 2013	52.3%	76.9%	14 days time extension per VO#03
September 2013	98.1%	100%	14 days time extension per VO#06
October 2013	100%	100%	October 07, 2014 <b>Final acceptance certificate</b>

### Project 05: Qalandiya-Jabaa Road Safety Enhancement

Construction on the project commenced on June 30, 2013. During the construction period, delays occurred due to challenges in managing construction activities and heavy traffic within a major thoroughfare connecting the middle and southern governorates in the West Bank, and changes in scope of works; scope of work was substantially reduced and new scope was requested. *All these delays are detailed under Section 03 in this report.*

The delays were largely mitigated by working on holidays, additional hours, night shifts and by utilizing additional workforce, however time extensions were necessary.

The completion date was modified once for this project (14 days time extension to cover excusable delays) extending the completion date to August 12, 2013. The project was fully completed on August 26, 2013. Site Handover and final walkthrough was conducted on August 26, 2013.

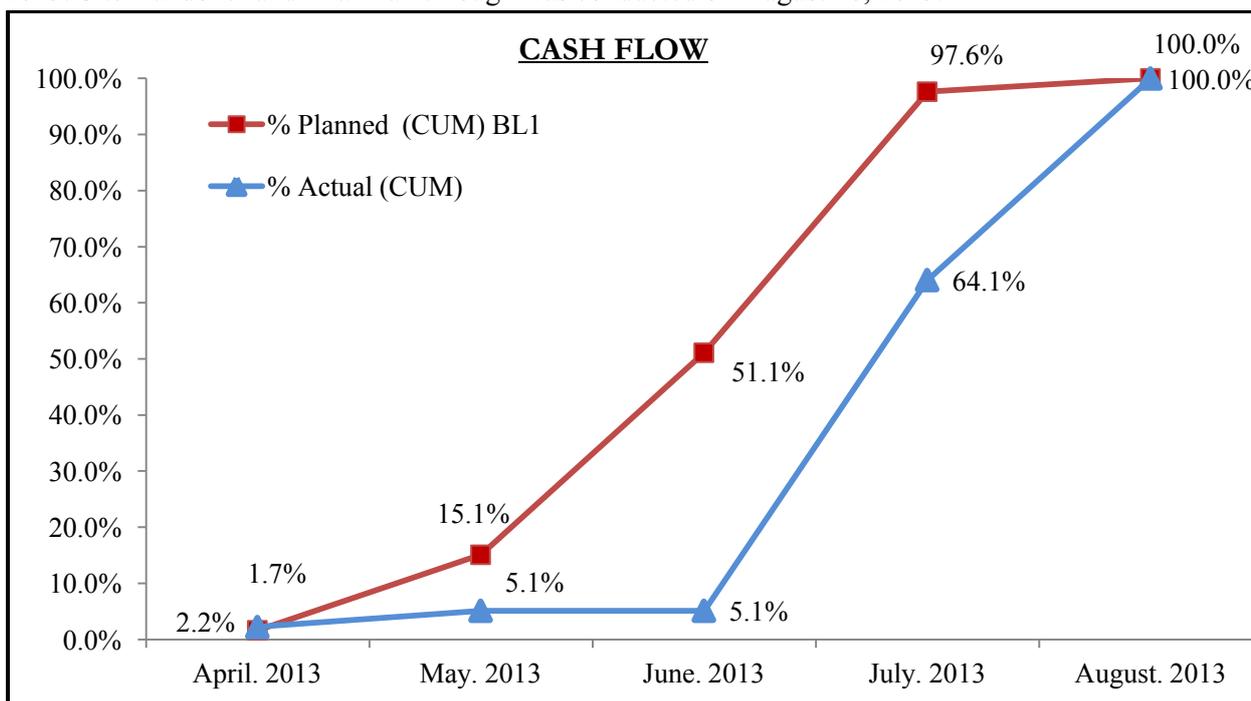


Figure 2.5: Qalandiya-Jabaa Road Safety Enhancement Works Progress – S-curve

The following table summarizes the progress in the construction works of the project:

Table 2.5: Project 05- Qalandiya-Jabaa Road Safety Enhancement Progress

Date	Actual Completion Percentage	Planned Completion Percentage (Baseline 01)	Comments
April 2013	2.2%	1.7%	
May 2013	5.1%	15.1%	
June 2013	5.1%	51.1%	
July 2013	64.1%	97.6%	
August 2013	100%	100%	14 days time extension per VO#03
			August 26, 2014 <b>Final acceptance certificate</b>

## Project 06: Al Thirwa Schools Road and Roads Retaining Structures

Construction on the project commenced on June 07, 2013. During the construction period, obstructions and delays occurred due to assigning and approving Right of Way and Centerline, Landowners' objections on works within the R.O.W, Relocation of existing utilities, Halhul Municipality Works prior asphalt works disturbing finished Basecourse layers, and Leakage of Existing Septic tanks along Seg. A. *All these delays are detailed under Section 03 in this report.*

The delays were largely mitigated by working on holidays, additional hours, night shifts and by utilizing additional workforce, however time extensions were necessary.

The completion date was modified once for this project (21 days time extension to cover excusable delays) extending the completion date to November 01, 2013. The project was fully completed on November 01, 2013. Site Handover and final walkthrough was conducted on Oct. 31, 2013.

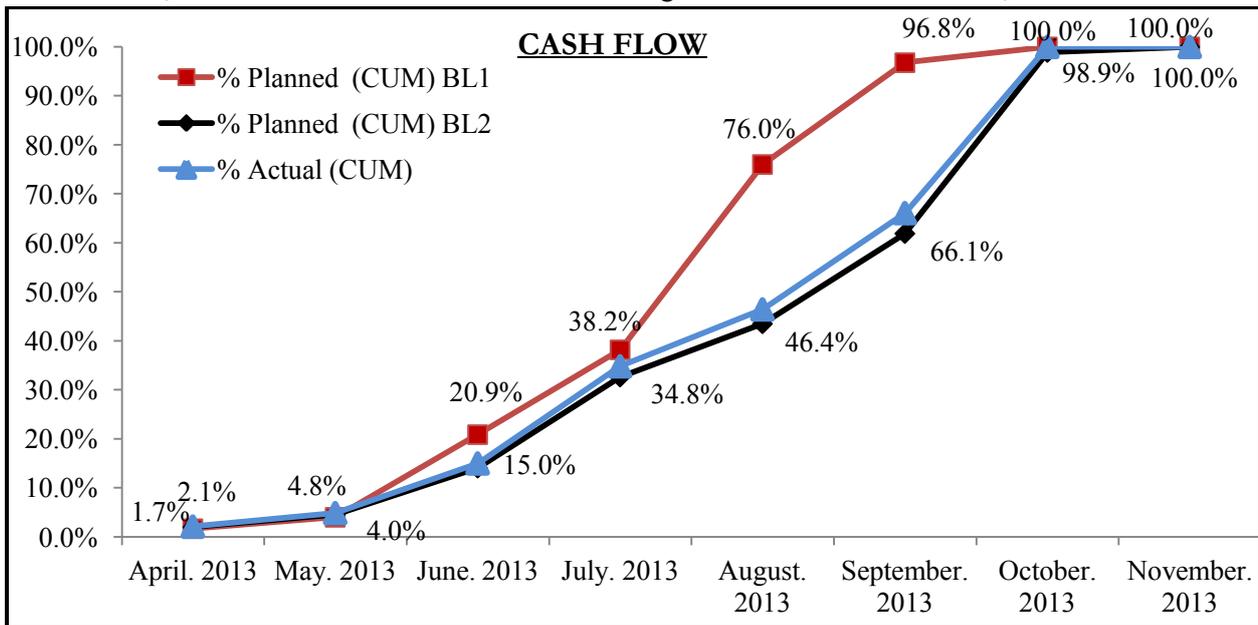


Figure 2.6: Al Thirwa Schools Road and Roads Retaining Structures Works Progress – S-curve

The following table summarizes the progress in the construction works of the project:

Table 2.6: Project 06- Al Thirwa Schools Road and Roads Retaining Structures Progress

Date	Actual Completion Percentage	Planned Completion Percentage (Baseline 01)	Comments
April 2013	2.1%	1.7%	
May 2013	4.8%	4.0%	
June 2013	15.0%	20.9%	
July 2013	34.8%	38.2%	
August 2013	46.4%	76.0%	
September 2013	66.1%	96.8%	21 days time extension per VO#06
October 2013	98.9%	100%	October 31, 2013 <b>Final acceptance certificate</b>
November 2013	100%	100%	

### Project 07: Milling and Overlay of Hebron Internal Roads

Construction on the project commenced on June 07, 2013. During the construction period, obstructions and delays occurred due to changes within scope of work, difficulties in managing heavy traffic inside Hebron city especially in Ramadan and Eid holidays, additional works especially Beit Enoon Roundabout construction and obtaining DCL approval and required permits, slow progress and poor quality of Hebron Municipality underground utilities works, local residents’ objections and physical attack on the project manager while he was performing his work duties, workmanship issues and severe weather (snow).

*All these delays are detailed under Section 03 in this report.*

The delays were largely mitigated by working on holidays, additional hours, night shifts and by utilizing additional workforce, however time extensions were necessary.

The completion date was modified eight times for this project (140 days time extension to cover excusable delays) extending the completion date to March 30, 2014. The project was fully completed on March 30, 2014. Site Handover and final walkthrough was conducted on March 30, 2014 for Hebron internal roads and on March 31, 2014 for Beit Enoon Roundabout.

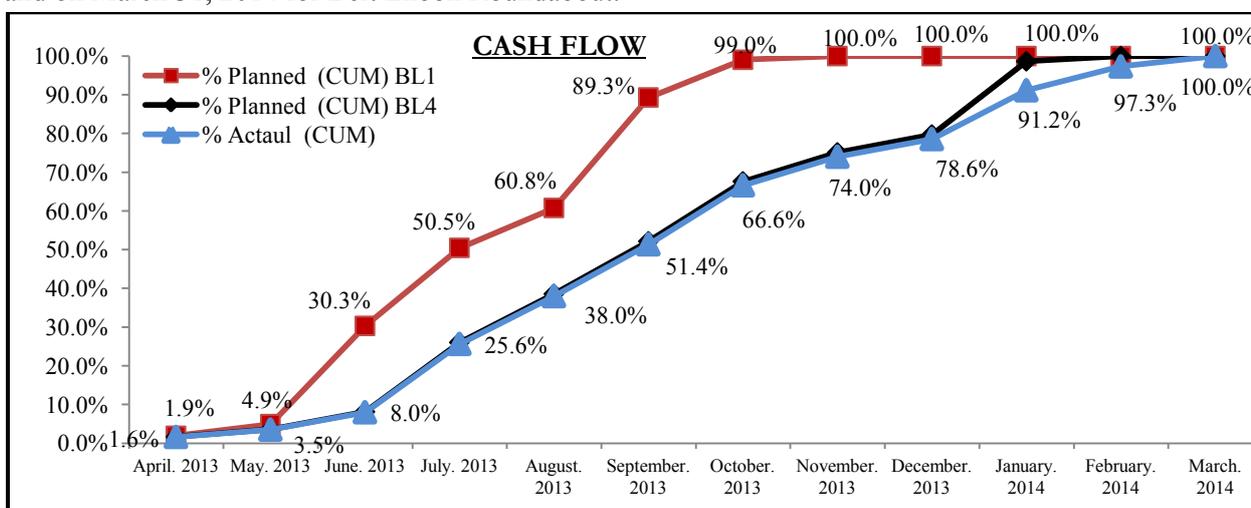


Figure 2.7: Milling and Overlay of Hebron Internal Roads Works Progress – S-curve

The following table summarizes the progress in the construction works of the project:

Table 2.7: Project 07- Milling and Overlay of Hebron Internal Roads Progress

Date	Actual Completion Percentage	Planned Completion Percentage (Baseline 01)	Comments
April 2013	1.6%	1.9%	
May 2013	3.5%	4.9%	
June 2013	8.0%	30.3%	
July 2013	25.6%	50.5%	
August 2013	38.0%	60.8%	
September 2013	51.4%	89.3%	
October 2013	66.6%	99.0%	
November 2013	74.0%	100%	45 days time extension per VO#09
December 2013	78.6%	100%	25 days time extension per VOs#12 and 13
January 2014	91.2%	100%	28 days time extension per VOs#15 and 16
February 2014	97.3%	100%	21 days time extension per VOs#17 and 18
March 2014	100%	100%	21 days time extension per VO#19
			March 30, 2014 <b>Final acceptance certificate</b>

## **Schedule Control**

Bi-Weekly meetings were held between APCO/ArCon's and Black and Veatch (CMC) schedulers monitored the progress of the project and compared the actual work percentage with the planned and offered improvements.

APCO/ArCon submitted monthly updated schedule and S-Curve. Planned schedules were updated automatically after the approval of variation orders that included time and/or scope extensions.

Please refer to Appendix H for a detailed as built time schedule.

The following table shows project progress in pictures:

<b>PROGRESS PHOTOS:</b>	
<b>Project 01- Wadi Al Jeer–Al Sawahira Al Sharqiya Road (Segment A)</b>	
<p>Before construction – From St. A0+120 to St. A0+220</p>	<p>After finishing construction.</p>
<p>Before construction – From St. A0+220 to St. A0+460</p>	<p>After finishing construction.</p>
<p>Before construction – From St. A0+600 to St. A0+800</p>	<p>After finishing construction.</p>

**PROGRESS PHOTOS:**

**Project 01- Wadi Al Jeer–Al Sawahira Al Sharqiya Road (Segment A)**



Before construction – From St. A0+800 to St. A1+100



After finishing construction.



Before construction – From St. A1+100 to St. A1+300



After finishing construction.



Before construction – From St. A1+300 to St. A1+420



After finishing construction.

**PROGRESS PHOTOS:**

**Project 02- Wadi Al Jeer–Al Sawahira Al Sharqiya (Segment B)**



Before construction – From St. B0+200 to St. B0+250



After finishing construction – From St. B0+200 to St. B0+250



Before construction – From St. B0+250 to St. B0+330



After finishing construction – From St. B0+250 to St. B0+330



Before construction – From St. B0+560 to St. B0+680



After finishing construction – From St. B0+560 to St. B0+680



Before construction – From St. B0+840 to St. B0+920



After finishing construction – From St. B0+840 to St. B0+920

**PROGRESS PHOTOS:**

**Project 03- Al Sawahira Al Sharqiya-Sheikh Sa'ed Road (Segment C)**



Before construction – From St. 0+980 to St. 1+080



After finishing construction – From St. 0+980 to St. 1+080



Before construction – From St. 0+936 to St. 1+057



After finishing construction – From St. 0+936 to St. 1+057



Before construction – From St. 0+200 to St. 0+500



After finishing construction – From St. 0+200 to St. 0+500

**PROGRESS PHOTOS:**

**Project 04- Wadi Al Nar Road (Segment V)**



Before construction – St. 0+170 Forward.



Project completed – New guardrail installed, road marking and cat eyes were installed and finished – St. 0+170 Forward.



Before construction – St. 0+325 Forward.



Project completed – New guardrail installed, road marking and cat eyes were installed and finished – St. 0+0+325 Forward.



Before construction – St. 0+380 Forward.



Project completed – New guardrail installed, road marking and cat eyes were installed and finished – St. 0+380 Forward.

**PROGRESS PHOTOS:**

**Project 04- Wadi Al Nar Road (Segment V)**



P#4 , Staion 0+480 Ahead

2013/05/23 14:22

Before construction – St. 0+480 Forward.



2013/10/01 09:52

Project completed – New guardrail installed, road marking and cat eyes were installed and finished – St. 0+480 Forward.



P#4 , Staion 0+787 Ahead

2013/06/23 14:17

Before construction – St. 0+787 Forward.



2013/10/01 09:56

Project completed – New guardrail installed, road marking and cat eyes were installed and finished – St. 0+787 Forward.

**Project 05- Qalandiya-Jabaa Road Safety Enhancement**



07/03/2013 09:33

Before construction –St. 0+920 backward.



08/24/2013 09:08

Project completed– New guardrail installed at the C.L, road marking and cat eyes were installed and finished.

**PROGRESS PHOTOS:**

**Project 05- Qalandiya-Jabaa Road Safety Enhancement**



Before construction –St. 1+280 backward.

Project completed – New guardrail installed at the C.L, road marking and cat eyes were installed and finished.



Before construction –St. 1+600 forward.

Project completed – New guardrail installed at the C.L, road marking and cat eyes were installed and finished.

**Project 06- Al Thirwa Schools Road and Roads Retaining Structures**



Before construction – Segment A – at St. 0+040 LHS

After finishing construction – Segment A – at St. 0+040 LHS

**PROGRESS PHOTOS:**

**Project 06- Al Thirwa Schools Road and Roads Retaining Structures**



Before construction – Segment A – at St. 0+440 LHS

After finishing construction – Segment A – at St. 0+440 LHS



Before construction – Segment C – at St. 0+000

After finishing construction – Segment C – at St. 0+000

**Project 07- Milling and Overlay of Hebron Internal Roads**



Before Milling – Road #7- University 2 Road at St. 0+100

Road marking and curbstone paint finished – Road #7- University 2 Road at St. 0+100.

**PROGRESS PHOTOS:**

**Project 07- Milling and Overlay of Hebron Internal Roads**



Before Milling – Road #7- University 2 Road at St. 0+550



Road marking and curbstone paint finished – Road #7- University 2 Road at St. 0+550



Before Milling – Road #8- Abu Majnouneh Road at St. 0+520



Road marking and curbstone paint finished – Road #8- Abu Majnouneh Road at St. 0+520



Beit Enoon Intersection - Before



Beit Enoon Roundabout – After completing construction works.

**PROGRESS PHOTOS:**

**Project 07- Milling and Overlay of Hebron Internal Roads**



Beit Enoon- St. A0+070- Before



Beit Enoon- St. A0+070- After completing construction works.



Beit Enoon- St. A0+140- Before



Beit Enoon- St. A0+140- After completing construction works.



Beit Enoon Roundabout – at night.



### **3** OBSTRUCTIONS, TIME EXTENSIONS AND ACTIONS TAKEN TO GET BACK ON TRACK

## Obstructions, Time extensions and Actions to get back on track

The seven projects comprising this Task Order each has its own challenges. The delays that have occurred were mainly attributed to a) changes in scope requirements b) change in design c) additional works d) R.O.W. related objections and frequent work stoppages e) existing underground utilities f) unsuitable soils (subgrade) g) slow pace of activities during the month of Ramadan h) other local councils works interfering APCO/ArCon works i) unprecedented severe weather (snow storm) j) slow start up and k) late delivery of solar lighting.

It's almost typical for all projects that are located in Area C to be delayed at commencement due to the lengthy approval process by GOI of traffic control plans in particular. This type of delay was experienced by APCO/ArCon on previous projects, and schedule delays were mitigated by increase in resources, manpower and working hours.

During the construction of this task order road projects, many obstructions and challenges were encountered. In this section, these obstructions and challenges are described in detail for each project:

### Project 01: Wadi Al Jeer–Al Sawahira Al Sharqiya (Segment A)

- 1- **Delay in approval for traffic control plan from DCL:** Coordination meetings with DCL were conducted; final approval was received for phase #1 on May 28<sup>th</sup>, 2013, approval procedure took 50 days while our schedule according to the contract allots 40 days for DCL's approval procedure. 10 days time extension to compensate this delay was granted in VO#03.
- 2- **Unsuitable sub-grade material** from St. A0+060 to St. A0+300, from St. A1+660 to St. A1+760 from St. A1+460 to St. A1+471, from St. 1+564 to St. A1+595 and from St. A2+071 to St. A2+120. CMC instructed the contractor to replace unsuitable soil with layers of 20cm topping material per site memos No. SM-13-0004-WJA-C-E-016, SM-13-0004-WJA-E-C-018 and SM-13-0004-WJA-C-E-052. Additional topping material quantity from St. A0+060 to St. A0+300 was reflected in VO#03 and an extension of 11 days was granted.
- 3- **Landowners' objections on:**
  - 3.1 R.O.W From St. A1+000 to St. A1+060, from St. A1+500 to St. A1+840 and from St. A2+480 to St. A2+250 caused periodic work stoppages, CMC was informed via. email and site memos, for example SM-13-0004-WJA-C-E-022 documented landowners stopping work from St. 1+720 to St. 1+840 LHS and SM-13-0004-WJA-C-E-061.
  - 3.2 Road alignment from St. A2+450 to St. A2+600 LHS stopped excavation works.
  - 3.3 Excavation works and sub-grade width from St. A2+500 to St. A2+600 on Sep. 2<sup>nd</sup>, 2013.
  - 3.4 Stopping of curbstone installation works by landowner from at St. A2+480 to St. A2+520 claiming that the road encroaches to his own land property and requesting additional asphalt works in the access road to his house.

Issues were resolved after several coordination meetings with Al Sawahira Al Sharqiya local council, Ministry of Public Works and Housing (MoPWH), locals and landowners.



Figure 3.1: Landowner objections and stoppage of road excavation from St. A1+720 to St. A1+840 LHS. Coordination site visit with landowner and local council representatives to resolve this issue.



Figure 3.2: Landowner objections and stoppage of road excavation between St. A2+500 and St. A2+600. Coordination site visit with landowner and local council representatives to resolve this issue.

#### 4- **Design changes:**

- 4.1 Shifting road centerline, change road alignment and location of stone boulders between St. A0+160 and St. A0+540 to improve road stability and widen cut section per site memos No. SM-13-00004-WJA-E-C-019, SM-13-00004-WJA-E-C-023 and SM-13-00004-WJA-E-C-024.
- 4.2 Shifting road centerline, change road alignment and location of stone boulders between St. A1+500 and St. A2+250 to improve sight distance and widen cut section per site memos No. SM-13-00004-WJA-E-C-033 and SM-13-00004-WJA-E-C-020.
- 4.3 Shifting road centerline, change road alignment between St. A2+500 and St. A2+700 to improve sight distance and widen cut section per site memo No. SM-13-00004-WJA-E-C-047.

Revised shop drawings were prepared and submitted to CMC according to received site memos, and construction works resumed after approval received on revised shop drawings.

#### 5- **Additional work:**

- 5.1 Installing new 1", 2" and 3" steel water pipelines including valves, chambers between St. A1+700 to St. A3+020 per site memo No. SM-13-00004-WJA&WJB-021 and SM-13-00004-WJA-E-C-050. And additional water crossing pipes according to SM-13-00004-WJA-E-C-042. Shop drawings were prepared accordingly, additional quantities were reflected in VO#06 and an extension of 14 days was granted.
- 5.2 Additional cleaning and removal of dump and rubbish materials from St. A0+000 to St. A0+400 at the LHS and RHA per site memo No. SM-13-00004-WJA-E-C-016.
- 5.3 Additional Widening and excavation works: in order to improve the sight distance, safety and stability of the road, additional widening and excavation works were performed resulting in an increase of the excavation quantities by approximately 40%. Since the excavation activity is on the critical path and based on the average production rate, a time extension of 11 calendar days was granted via. VO#03.

#### 6- **Relocation of existing utilities:**

- 6.1 Relocation of Telephone poles (Bazic) from sta. A1+440 to sta. A2+700 caused work disruptions and delays during July, August and September. This issue was resolved by intensive coordination with PALTEL and Bazic companies.
- 6.2 Relocation of electric poles from sta. A2+400 to sta. A2+600 caused work disruptions and delays during September and October. Coordination meetings with JDECO were conducted to relocate electric poles and solve this issue.

7- **Heavy Traffic:** managing heavy traffic during construction of roundabout at sta. A2+770 was challenging, additional safety measures were implemented to assure proper traffic flow during construction works.

8- **Severe weather:** an unprecedented snow storm affected life in general in the WB including construction activities between Dec. 11<sup>th</sup> to Dec. 16<sup>th</sup> caused delays in finishing asphalt works and road marking. APCO was granted an extension of time for 5 days per VO#12.

9- **Delay in shipping from Europe of street light fixtures:** APCO requested shipping by air the entire lighting package from Britain. Unfortunately, the delay in receiving them was beyond our control and even beyond the control of Heathrow Airport Authority in London. Delay is related to El AL security and to down grading airplane size. The lighting package arrived at Tel Aviv airport on Dec. 20, 2013; APCO/ArCon scrambled and used all means they can to have it released on Dec. 25, 2013, although the street was opened to traffic on time, the light fixtures were not installed until Dec. 26, 2013.

## Project 02: Wadi Al Jeer–Al Sawahira Al Sharqiya (Segment B)

- 1- **Delay in approval for traffic control plan from DCL:** Coordination meetings with DCL were conducted; final approval was received for phase #1 on May 28<sup>th</sup>, 2013, approval procedure took 50 days while our schedule according to the contract allots 40 days for DCL’s approval procedure. 10 days time extension to compensate this delay was granted in VO#03.
- 2- **Unsuitable sub-grade material** from St. B0+020 to St. B0+054, from St. B0+340 to St. B0+380 and from St. B0+625 to St. B0+670. CMC instructed the contractor to replace unsuitable soil with 20cm topping layer material per site memos No. SM-13-00004-WJB-E-C-020, SM-13-00004-WJB-C-E-015 and SM-13-00004-WJB-C-E-028. Additional topping material quantity from St. B0+020 to St. B0+054 was reflected in VO#03 and an extension of 11 days was granted.
- 3- **Landowners’ objections on:**
  - 3.1 R.O.W and road widening from St. B0+140 to St. B0+350 and from St. B0+400 to St. B0+600 caused periodic work stoppages.
  - 3.2 Stone walls construction from St. B0+450 to St. B0+600 LHS and from St. B0+430 to St. B0+440 LHS caused work stoppages and damage to the constructed stone walls on Sep. 3<sup>rd</sup>, 2013.

Issues were resolved after several coordination meetings with Al Sawahira Al Sharqiya local council, Ministry of Public Works and Housing (MoPWH), locals and landowners.
- 4- **Additional scope:** New water pipeline along the road from St. B0+100 to St. B0+985 per CMC site memo No. SM-13-00004-WJA&WJB-021. Shop drawings were prepared accordingly 620 L.m of 2” steel pipe and 60 L.m of 1” steel pipe were installed including fittings, a time extension of 11 days was granted via VO#03 and VO#06 for this additional scope.
- 5- **Relocation of existing utilities:**
  - 5.1 Existing telephone poles relocation caused work disruptions during the month of July, 2013. This issue was resolved after intensive coordination with PALTEL.
  - 5.2 Installation of 3 electric poles by JDECO in road carriageway caused work disruption, after coordination with JDECO the company removed the installed poles and issue was resolved.
- 6- **Severe weather:** an unprecedented snow storm affected life in general in the WB including construction activities between Dec. 11<sup>th</sup> to Dec. 16<sup>th</sup> caused delays in construction works. APCO was granted an extension of time for 5 days per VO#12.

## Project 03: Al Sawahira Al Sharqiya-Sheikh Sa’ed Road (Segment C)

- 1- **Landowners’ objections on:**
  - 1.1 Relocation of olive trees from St. C0+100 to St. C0+400 caused work disruptions during May and June 2013. Issue was resolved through coordination with Al Sawahreh and Al Sheikh Sa’ad local councils.
  - 1.2 Road widening from St. C0+630 to St. C0+730 and shifting road centerline caused work disruptions during July and August 2013. According to SM-13-00004-SSC-045, and in response to Al Sawahira Al Sharqiya council request, the contractor was requested to shift

the road centerline from St. C0+600 to St. C0+760; accordingly coordination meetings with local council and landowner were conducted.

1.3 Asphalt works: On November 18th, 2013 and during asphalt works local residents adjacent to the project's site demanded the contractor install additional asphalt works near to the road within their private property, the CMC refused to perform additional asphalt works since additional asphalt is not within the project scope. Few residents physically assaulted the CMC and Contractor's staff. As a result (4) people (2) from subcontractor and (2) from B&V) sustained superficial injuries. Damages also occurred to vehicles and equipment. The CMC and the Contractor stopped the work and evacuated the site due to safety and security reasons and to avoid further confrontation. Later, USAID requested the Contractor to resume the works. The Contractor during a site meeting with USAID on November 25, 2013 requested more time to allow him to assess the site conditions and reply to USAID as they still have some security concerns, 7 days time extension were granted under VO#10 to allow the contractor to properly evaluate and assess the condition and respond to USAID . On Dec. 03rd VO#11 was issued extending project period 14 calendar days to allow the contractor complete the remaining works as defined in the project scope of work, and issue resolved in coordination with Bethlehem police. Asphalt works was completed in the presence of special police force. The subcontractor (Al Fakher) submitted a claim to USAID regarding this stoppage of work. USAID response was received on May 30, 2014 requesting further price justification. The value approved by USAID on this claim is \$11,014.15. APCO/ArCon and the subcontractor will submit justification letter for requested claim amount to USAID. Issue is not resolved yet.

1.4 Concrete protection works at box culvert outlet at St. C0+120, work stopped on Nov. 11, 2013 due to landowner objection claiming that outlet concrete protection encroaches his own land. CMC was informed via site memo No. SM-13-00004-SSC-C-E-059 and coordination meetings with Al Sawahira Al Sharqiya and Al Sheikh Saad local councils were conducted to solve this issue.

2- During June 2013 the **discovery of 2 Caves and a Romanian well** at St. C0+050 LHS and C0+280 stopped activities along this road section. Related Palestinian and Israeli authorities were directly informed and investigated the caves to determine its archeological significance. According to their recommendations the 2 caves and well have no significance. SM-13-00004-SSC-C-E-008 and CMC site memo No. SM-13-00004-SSC-E-C-027 directed contractor to demolish and backfill discovered cave at St. C0+280.



Figure 3.3: Palestinian related authorities while investigating the discovered caves.



Figure 3.4: Israeli related authorities while investigating the discovered Romanian well / cave at St. C0+280 C.L.

3- **Unsuitable sub-grade material** between St. C0+940 to St. C0+980 caused delay to gravity wall construction and basecourse works from sta. C0+150 to sta. C0+200. CMC was informed and geotechnical investigation was conducted. According to CMC site memo No. SM-13-00004-SSC-E-C-035 unsuitable subgrade materials were replaced with 2 layers of topping material (20cm each)

4- **Design changes and additional work:**

4.1 Replacement of triple pipe culvert with 2 cell box culvert at St. C0+119 per CMC response on RFI No. 09. Design revisions were received from CMC via site memo No. SM-13-00004-SSC-E-C-048.

4.2 Existing Asbestos containing culvert encasement: after discovery of existing Asbestos containing culvert at St. C0+122, CMC site memo No. SM-13-00004-SSC-E-C-011 instructed the contractor to encapsulate the existing culvert with concrete in a safe method that protects the workers, the public and the environment. Activity Hazard Analysis (AHA) was prepared including proper method to encase



Figure 3.5: Existing Asbestos containing culvert at St. C0+122.

with concrete in accordance with CMC related report. The time needed to execute the additional excavation and concrete works related to sealing the asbestos pipe culvert was covered by the 21 days extension of time granted under VO#03 to perform the additional new water line (concurrent activities) see below item 4.3.

4.3 New 4” water pipeline from St. C0+500 to St. C1+290 to replace existing deteriorated 2” water pipeline per CMC site memo No. SM-13-00004-SSC-E-C-022. An extension of 21 days was granted under VO#03.

4.4 New sewer lines between St. C0+129 to St. C1+273.

4.5 Box Culvert new design for existing culvert at sta. C0+120 was received from CMC via site memo SM-13-00004-SSC-E-C-048. Shop drawings and detour road were prepared accordingly.

4.6 Substitution of boulder walls by gravity walls from St. C0+939 to St. C1+057 according to CMC instructions site memo No. SM-13-00004-SSC-E-C-004. This item was included in VO#01 without a time extension.

4.7 Replacement of existing sewer pipelines: following the start of excavation at Al Sawahira Al Sharqiya-Sheikh Sa’ad Road, it was observed that the existing sewer pipelines and house connections are shallow, in severely deteriorated conditions and leaking at several locations. The leaking sewer pipelines may expose the integrity and sustainability of the road project to high risks if not replaced. After due consultation with USAID and local authorities, it was decided to replace the existing deteriorated pipelines with new sewer

pipelines including all related connections and chambers. According to site memo No. SM-13-00004-SSC-C-E-002 and SM-13-00004-SSC-E-C-008 the contractor was instructed to replace existing 6” dia. sewer pipeline with a new 8” dia. UPVC pipeline from St. C0+129 to St. C1+273 with its manholes and house connections. Accordingly, VO#02 was approved and 25 days time extension was granted to cover this additional work.

4.8 Shifting Centerline: According to SM-13-00004-SSC-045, and in response to Al Sawahira Al Sharqiya council request, the contractor was requested to shift the road centerline from St. C0+600 to St. C0+760.

5- **Traffic Control Plan implementation**: work progress was impacted due to challenges faced during implementing traffic control measures within narrow existing roads with no available detours. Detours were accommodated within construction area (no other detours available) by dividing the street, also, new detour was created with the road detour it was not possible to accommodate Al Sheikh Sa’ad residents. This issue was mostly challenging between St. C1+000 and St. C1+290 while working in narrow residential area with no available detours that slowed progress rate especially for underground utility installation. Additional safety measures were provided in this segment.

6- **Challenging Construction of Box culvert at St. C0+130:**

Construction of the box culvert at St. 0+130 was challenging due to the following reasons:

- 5.1 Proposed box culvert was built across an existing active waste water stream (*wadi*), diversion of this *wadi* was challenging, a special diversion plan was prepared and a temporary pipe culvert was installed to enable the start of excavation for the box culvert.
- 5.2 The Stream flooded several times especially during winter and stopped the works, dewatering and cleaning works were performed prior commencing work activities.
- 5.3 Diverted raw sewage stream strong odor especially during the hot weather was also a challenge. Precautions were taken to include tool box discussion with work forces to safeguard health and safety. Masks and other protective equipment were supplied to all workers.
- 5.4 Design revisions from triple pipe culvert into box culvert consumed time. New design for was received from CMC via site memo SM-13-00004-SSC-E-C-048. Shop drawings and detour road were prepared accordingly.



Figures 3.6 and 3.7: Existing active waste water stream (wadi) where the Box culvert at St. C0+130 was constructed.

## 7- Existing Utilities Relocation:

7.1 Relocation of existing high voltage electrical tower (HVET) at St. C0+720 RHS caused work disruption; HVET was relocated after coordination with JDECO, between Sep. 9<sup>th</sup> and Sep. 14<sup>th</sup>.

7.2 Relocation of existing electrical pole at St. C0+618 LHS for safety reasons according to SM-13-00004-SSC-E-C-052.

8- **Others:** Flooding of existing sewer lines due to blockage caused by residents dumping solid waste inside the sewer line caused work delay; coordination meetings with local council were conducted to solve this issue.

## Project 04: Wadi Al Nar Road (Segment V)

1- **Heavy Traffic:** one of the most serious challenges during this road implementation was performing the construction activities and managing the heavy traffic within a major thoroughfare connecting the northern and southern governorates in the West Bank. Traffic and safety plans were planned and strictly implemented to eliminate any safety hazard on motorists and labors. Asphalt works were challenging due to heavy traffic and steep slopes, coordination with Bethlehem police and safety plan was prepared to control asphalt works, the works finished with zero accidents.



Figure 3.8: Challenging asphalt works due to heavy traffic and steep slopes.



Figure 3.9: Managing heavy traffic during the construction was challenging.

## 2- Existing and New Utilities:

2.1 Existing sewer lines (crossings) in road segment from St. 0+700 to St. 0+950 affected excavation and construction works. Coordination meetings with Obaydiya municipality were performed to resolve this issue. CMC instructed contractor in SM-13-00004-WNV-E-C-003 to replace and lower the existing sewer pipeline (6" UPVC) at St. 0+720 and St. 0+910.

2.2 Fiber optic installation by PALTEL within the construction area caused disruption to work activities during June, July and August. Coordination meetings were conducted with PALTEL and CMC to finish fiber optic installation independently within a specified time frame. Contractor informed PALTEL that he will only work in these areas after PALTEL finish their work and site handover



Figure 3.10: PALTEL Fiber optic cable installation works.

back to contractor. PALTEL performed installation works during *Eid Al Fitr* Holiday, some damages occurred to the existing base course layers, and cable trench was filled with Base course and concrete pavement.

2.3 Existing solar light poles not functioning. CMC was informed via and an evaluation report was prepared and submitted to CMC. Engineer requested retrofitting of the solar units and issue resolved.

2.4 Relocation of existing solar lighting poles from 0+420 to 0+600 RHS and at 0+330 LHS.



Figure 3.11: Solar lighting poles after relocation.

3- **High cliffs over work area:** during June, July and August danger and hazards presented by high cliffs (residential area) over work area. APCO/ArCon raised their concerns to CMC via SM-13-00004-WNV-C-E-006 due to the proximity of existing buildings and limited work space, it was impossible to construct berm or place reinforced concrete barrier at these locations. It was agreed that Obaidiya Municipality will prepare the needed safety measures as it is outside the ROW.

4- **New guardrail installation:** Installation of new guardrail replacing the existing damaged guardrails presented safety challenges during implementation. Works were performed in sequence; existing guardrail was removed, after preparation work for new guardrail installed, and then new guardrail was installed without leaving open gaps.



Figures 3.12 and 3.13: Existing hazards presented by high cliffs (residential area) over work area.

## Project 05: Qalandiya-Jabaa Road Safety Enhancement

1- **Heavy Traffic:** one of the most serious challenges during this road implementation was performing the construction activities and managing the heavy traffic within a major thoroughfare connecting the middle and southern governorates in the West Bank. Traffic and safety plans were planned and strictly implemented to eliminate any safety hazard on motorists and labors. Night works were performed to minimize interference with traffic flow.

2- **Additional Works:** scope of work was substantially reduced and new guardrail type was requested. Additional works were also requested (milling and overlay from sta. 2+220 towards Jaba intersection via site memo SM-13-00004-QAL E-C 042). Additional works were performed and completed during night to minimize interruption to traffic and maximize safety.

## Project 06: Al Thirwa Schools Road and Roads Retaining Structures

Project 06 suffered some delays mainly due to landowners' objections to the R.O.W causing frequent work stoppages as detailed below:

- 1- **Right of Way and Centerline:** at the start of the project approving ROW and C.L from Halhul Municipality was challenging, several coordination meetings were conducted with the municipality to receive the final approval on R.O.W.
- 2- **Landowners' objections on works within the R.O.W** caused work stoppages at the following locations:
  - 2.1 Removing existing stone and boundary walls that were encroaching into the R.O.W and interfering with the construction of new gravity and boulder walls at Segment A.
  - 2.2 Gravity wall construction was stopped at St. A0+410.
  - 2.3 Gravity wall construction from St. A0+590 to St. A0+620 (37 days) from July 07, 2013 to August 13, 2013.
  - 2.4 Segment C- stone boulder construction from St. C0+000 to St. C0+140 RHS (16 days) from August 01, 2013 to August 17, 2013.
  - 2.5 Segment C- stone boulder construction from St. C0+040 to St. C0+067.
  - 2.6 Segment C- stone boulder construction from St. C0+335 to St. C0+410.
  - 2.7 Segment C- stone boulder construction from St. C0+125 to St. C0+135 (2 days) from August 17, 2013 to August 19, 2013.
  - 2.8 Segment C- stone walls from sta. C0+000 to sta. C0+160.
  - 2.9 Subgrade preparation from St. C0+200 to St. C0+420 and from St. A0+350 to St. A0+590 at Segment C.
  - 2.10 Concrete protection works stoppage in Segments A, B and C.



Figure 3.14: Work stoppage due to landowners' objections on stone boulder construction from St. C0+000 to St. C0+140 RHS at Segment C.

Halhul municipality was involved to solve these issues with locals, intensive coordination meetings and joint site visits were conducted to resolve all mentioned issues and resume construction works.



Figures 3.15 and 3.16: Work stoppage due to landowners' objections on subgrade works from St. A0+350 to St. A0+590 at Segment C.

- 3- **Relocation of existing utilities:** existing electrical poles in Segments A, B and C caused work disruptions and delays. Issues were resolved after coordination with South District Electrical Company.

#### 4- Halhul Municipality Works:

- 4.1 Installation of storm water line by Halhul municipality prior asphalt works caused work disruption. Basecourse second layer works were finished and handed over on Oct. 23, 2013, unfortunately Halhul municipality installed storm water pipes across the road in Seg. B between St. B0+295 and St. B0+305. The mentioned works disturbed finished basecourse layer. CMC was informed via SM-13-00004-THR-C-E-056.
- 4.2 Demolishing of newly constructed ramp and stairs at St. A0+190 LHS- Segment A. CMC was informed via SM-13-00004-THR-C-E-062.

**Leakage of Existing Septic tanks along Segment A:** After completing the excavation works at Halhul, over 20 cesspits were discovered within the right of way of the road (mostly in the shoulder). Some of them were leaking due to their poor quality, while the rest were overflowing as their owners were not emptying them regularly. If works proceeded as originally planned, without any interventions to address the sewer problem, the leaking cesspits will adversely affect the lifetime of the project. Special meeting with USAID was held on Sep. 9<sup>th</sup> to discuss this issue. During this meeting and according to BV physical assessment, it was agreed that the best feasible and practical option is to repair the 5 cesspits that are in a bad condition, knowing that this option might still entail certain risks. SM-13-00004-THR-E-C-060 was issued by CMC instructing the contractor to protect septic tanks at St. A0+260, St. A0+390, and St. A+0600 and conduct an assessment for septic tanks condition at St. A0+170 and St. A0+240, and make proper repair or reconstruction.

It was mutually clear and understood that certain risks are still associated with the adopted option of repairing 5 of the existing cesspits, those risks might include certain uncontrolled damages to the body of the road.

Therefore, APCO submitted on September 11, 2013 through Letter No. AID-08-13 the below reservation:

1. Tanks are very close to the road; leakage and overflow are expected, therefore, as indicated in BV assessment, uncontrolled damage to road construction is likely.
2. Considering the possibility of damages that will not be related to APCO work, it is reasonable to conclude our one year maintenance for this segment of the road will not cover issues related to or caused by the septic tanks.

The CO assessed the situation and concurs with APCO's reservation to exclude the one year warranty from the possible damages that are attributed solely to leakages in the existing cesspits. A time extension of 21 days was granted to accommodate for the additional repair works for the 5 existing septic tanks under VO#06.



Figures 3.17 and 3.18: Leakage of Existing Septic tanks along Segment A.

## Project 07: Milling and Overlay of Hebron Internal Roads

Project 07 suffered some delays and work disruptions due to changes within scope of work, additional works, vehicular / pedestrian traffic especially prior to Ramadan and Eid Holidays, work stoppages due to local residents' physical attack on the project manager while he was performing his work duties, Hebron municipality works (underground utilities and road widening) interfering APCO/ArCon works, severe weather (snow storm), workmanship issues and delays in obtaining DCL approvals for works at Beit Enoon Roundabout. Below these obstructions are detailed:

- 1- **Changes within scope of work:** Some roads from the original scope were deleted other new were added, RFI#02 was submitted to CMC, meetings were held with the CMC and Hebron Municipality and final list of roads was received and reflected under VO#03.
- 2- **Heavy Traffic:** managing heavy traffic inside Hebron city was challenging, some roads were narrow and traffic was slowing progress, heavy vehicular and pedestrian traffic during Ramadan and before Eid Al Fitr (especially at Al Salam road) slowed work progress, milling and overlay at project 07 was not even possible from August 1st to 6th due to the high increase of vehicular/pedestrian traffic prior to Ramadan Eid holiday. Night work and special traffic control procedures were implemented. Stoppage of works occurred at the beginning of August from August 1<sup>st</sup> to August 6<sup>th</sup>.
- 3- **Additional Work:**
  - 3.1 Substantial increase beyond original quantities of road patching, reconstruction, manhole adjustment, and replacement of damaged curbstone scattered all over. Contractor increased resources, performed night work and provided an alternate patching method.
  - 3.2 Beit Enoon Roundabout:

Beit Enoon roundabout was received as an addition to the original scope of Project 07. It is under the jurisdiction of MAATZ, therefore, intense and detailed coordination and plans were necessary to commence the works that include:

    - a. Permits from MAATZ and DCL for traffic control plan and start construction.
    - b. After signing VO#9 it was agreed to start implementing traffic control plan immediately but unfortunately the works stopped upon Hebron DCL from Nov. 12<sup>th</sup> 2013 to Nov. 20<sup>th</sup> 2013, CMC was informed via SM-13-00004-HEB-C-E-063. 9 days time extension was granted under VO#13 as this work stoppage was beyond the control of the contractor and could not have been anticipated.
    - c. Traffic control plan was implemented and approved by MAATZ representative on Nov. 27<sup>th</sup> 2013.
    - d. Excavation works started on site for road widening on RHS and LHS.
    - e. Challenges and difficulties: DCL permit requirement to perform construction activities as a night works from Nov.27<sup>th</sup> 2013 to Dec. 5<sup>th</sup> 2013, heavy traffic, relocation of existing utilities, objection of the land owners for road widening at St. A0+160 LHS, and obtaining Maatz approval of received electrical works via SM-13-00004-HEB-E-C-088, and renewal of Israeli police permit slowed work progress and caused delays. Electrical works permit was received on Feb. 23, 2014 via SM-13-00004-HEB-E-C-092.

An extension of 45 days was granted under VO#09 for Beit Enoon Roundabout construction, interim time extensions (a total of 49 days) were granted through variation orders 15 and 16, 17 and 18, and 21days were granted under VO#19.

#### 4- Hebron Municipality Works:

4.1 Slow progress and poor quality of municipality excavation works for underground utilities and road widening after starting and finishing milling forced stoppage of work at Jabal Johar road, Al Mashroo' Wadi Al Haroya road, Al Quds Shaheen road, University road and Abu Majnona road, construction activities moved to other roads. CMC was informed via SM-13-00004-HEB-C-E-021, HEB-C-E-036, HEB-C-E-040, HEB-C-E-058, HEB-C-E-060, and HEB-C-E-064. Intensive coordination with Hebron municipality, Daily coordination and meetings with Hebron Municipality engineers to minimize interference with APCO works were conducted, and progress meetings were held weekly every Saturday to follow-up on obstacles and municipality works progress.



Figure 3.19: Hebron municipality sewer line works at Al Mashroo' Wadi Al Hariya Road from sta. 0+430 to sta. 0+460.



Figures 3.20 and 3.21: Hebron municipality underground utilities works at Al Mashroo' Wadi Al Hariya Road from Sta. 0+840 to 0+940 LHS



Figure 3.22: Hebron municipality underground utilities works at Al Deek Road from St. 0+680 to St.0+720.



Figure 3.23: Hebron municipality underground utilities works at Al Deek Road from St. 1+300 to St. 1+430.



Figures 3.24 and 3.25: Hebron municipality underground utilities works at Jabal Johar Road.

4.2 Damages to the roads curbstone, manholes, thermoplastic paint and asphalt surface during Hebron municipality snow removal between Dec. 11 and Dec. 16, 2013 as the followings:

- Damage to curbstone at University Road 2.
- Damage to adjusted manholes in Al Quds Square Shaheen Road and University Road 2
- Removal of the performed thermoplastic paint road marking in different roads
- Damage to asphalt surface (in the milled area) in Al Mizan Road, Ein Sara Road , Al Quds Square Shaheen Road, University Road 2, Al Mashrou' Wadi Al Hariya Road.



Figure 3.26: Damages of thermoplastic road marking caused by Hebron municipality snow removal at Al Salam Road.



Figure 3.27: Removal of constructed median in University Road #2 after Hebron municipality removed snow from the road.

5- **Local residents' physical attack on the project manager while he was performing his work duties:** Project Manager -Engineer Turki Abu Sneineh - was a victim of cruel physical attack on the job site by local residents while he was performing his work duties. Works was stopped from Sep. 12<sup>th</sup> to Sep. 17<sup>th</sup>, and resumed after intensive coordination with Municipality, USAID, BV and APCO/ArCon.

6- **Severe Weather:** Severe weather (snow) between Dec. 11<sup>th</sup> to Dec. 16<sup>th</sup>, the following days were not any better, temperature was low and snow removal slow making roads unsafe which paralyzed much of the West Bank, the extended effects of the storm lasted until Dec. 26<sup>th</sup>. Hebron was hit hard bearing the brunt of the storm with unprecedented accumulation of snow.



Figure 3.28: Severe weather (snow) at Beit Enoon Roundabout.

Contractor did not wait for nature to take its course and melt the snow; the contractor cleared the streets from snow to expedite asphalt installation and pumped cumulated water at Beit Enoon roundabout. As a result of the severe weather conditions, APCO was granted, a no cost time extension of Sixteen (16) Calendar Days under VO#12 and VO#13.



Figures 3.29 and 3.30: Snow removal by contractor from Hebron Internal Roads.

7- **Workmanship issues** CMC and USAID raised their concerns regarding the workmanship quality mainly on University 2 and Ein Sarah Roads for the following work items:

- 7.1 Thermoplastic Paint
- 7.2 Curbstone
- 7.3 Manhole adjustments.
- 7.4 Asphalt Joints and finish

Remediation works were conducted for the curbstone paint, thermoplastic paint and manhole adjustments. Regarding the asphalt, corrective actions (different scenarios) were discussed with the CMC, the contractor rectified all asphalt areas and performed milling and overlay to the full width of Ein Sara road.

Contractor and CMC coordinated closely and resolved majority of outstanding issues, contractor prepared submittal documents to allow execution of revisions. Contractor responded to delays by increasing man-power and performing night work.

## Time extensions and actions to get back on track

To overcome previously detailed issues and mitigate the delays and get back on track, twenty Variation Orders were issued to cover the projects changes and time extensions were granted to cover the delays mentioned above as detailed below:

Project 01- WJA	Total Excusable delays/approved extensions	40 Days
Project 02- WJB	Total Excusable delays/approved extensions	31 Days
Project 03- SSC	Total Excusable delays/approved extensions	72 Days
Project 04- WNV	Total Excusable delays/approved extensions	28 Days
Project 05- QAL	Total Excusable delays/approved extensions	14 Days
Project 06- THR	Total Excusable delays/approved extensions	21 Days
Project 07- HEB	Total Excusable delays/approved extensions	140 Days

It is important to note the large scope of this project, and the many challenges encountered appeared to jeopardize the schedule and delivery of the works. APCO/ArCon mitigated the challenges and possible delays by successfully employing a “fast track construction method“. Directed by APCO/ArCon’s management, the construction professionals altered the daily progress by procuring materials/supplies, locating and employing proper equipment, managed the daily and night shifts activities and developed on the spot recovery plans resulting of the on time handing over of most of the works with added scope utilizing realized savings.

# 4 || SAFETY PROGRAM AND MEASURES

# Safety Measures on Site, Accident Reporting and Personal Protective Equipment

## Safety and Health Objectives

APCO/ArCon Construction and Services places top value on safety and health. APCO/ArCon assigned qualified Safety and Environmental Officer (SEO) and Safety officer assistant were responsible for making regular job site safety inspections, enforcing the use of safety gear and equipment, ensuring that all Subcontractors and staff are complying with safety requirements, providing on-going safety training to staff. The safety program mandated the safety implementation.

## Safety Training

APCO/ArCon provided Safety training to its staff, subcontractors, and labor through informal weekly talks held in the field (Tool Box Meetings) or whenever needed. Different topics were discussed about applying safety measures such as the Personal Protective Equipment “PPEs”, concentrating on the importance of keeping the site clean and safe. All staff were directed to keep the working area free from rubble and debris. The schedule for tool box meetings was coordinated with CMC/RE, to address various safety topics that are applicable to the specifics of this project.



Figure 4.1: Safety Toolbox talk at Project 01- WJA



Figure 4.2: Safety Toolbox talk at Project 02- WJB



Figure 4.3: Safety Toolbox talk at Project 03- SSC



Figure 4.4: Safety Toolbox talk at Project 04- WNV



Figure 4.5: Safety Toolbox talk at Project 06- THR



Figure 4.6: Safety Toolbox talk at Project 07- HEB

## Job Site Inspections

The SEO toured the site to observe potential safety/health hazards, including the potential hazards of confined space. The safety officer coordinated and planned for the safety and welfare of all workers on site that include the following as a minimum:

1. Guarding against the hazard.
2. Providing personal protective equipment and enforcing its use.
3. Training workers on safe work practices.

## Activity Hazard Analysis (AHA)

On site, SEO developed an AHA with the subcontractor when needed. The safety manager worked to determine the activities to be performed and identified the sequence of work, anticipated the specific hazards, inspected site conditions, equipment, materials and implemented control measures to eliminate and/or minimize each hazard.

During this task order projects period, (an average of 208,952 man power hours), projects were delivered fatal accidents free. 2 minor normal construction incidents occurred relating to equipment (as explained below) and 2 non-construction incidents involved local residents physically assaulting our project staff because residents were unhappy their personal demands were not met. One Notice of Unsafe Condition issued “NUC” as follow:

NUC ID	Date	Location	Level	Hazardous condition	Taken corrective measures	Correction Date
01	August 20th, 2013	Project 06 Segment A and Segment C	A & B	Open excavation without proper protection, work using steel cutter without proper PPEs and poor dust control.	1-Appropriate safety measures were implemented at segment C during construction works, no open excavation were left after work day. 2-Frequent dust control was applied using water spray tankers along segments A and B. 3-One worker not wearing PPEs was removed from construction site and was instructed to comply with health and safety instructions. Toolbox meeting regarding the importance of PPEs was conducted for all workers on site by our safety and environmental compliance officer.	All notices were corrected immediately; official correction report was submitted to CMC on August 22, 2013.

No.	Date	Location	Accident Condition	Action Taken
01	June 1 <sup>st</sup> 2013	Project 04- WNV at St.0+180	One vehicle ran into another causing minor scratch to rear door – No injuries.	Al-Obeidiya municipality representatives came to site, reviewed condition and resolved the issue.
02	August 6 <sup>th</sup> , 2013	Project 04- Wadi Al Nar Project (Segment V) at St.0+120	Milling machine fell off during loading onto truck. Machine operator suffered superficial injury.	Operator immediately transported to Hadasa medical center for check-up and treatment. Operator released upon treatment in good health condition.
03	September 12, 2013	Nimra Road- Hebron – Project 07	Project Manager- Engineer Turki Abu Sneineh - was a victim of cruel physical attack on the job site by local residents while he was performing his work duties , as a result ,Turki sustained some injuries. The attack on Turki is the result of unreasonable resident objections to curb stone work.	Eng. Turki was sent immediately to the hospital to receive the needed medical care; the Palestinian police arrested some of the people involved, and APCO/ArCon immediately suspended all work on this project to ensure the safety of all on-site personnel including CMC and subcontractors, and USAID has been informed accordingly.

No.	Date	Location	Accident Condition	Action Taken
04	Nov. 18, 2013	Project 03- at St. C0+800	On November 18 <sup>th</sup> , 2013 and during asphalt works local residents adjacent to the project's site demanded the contractor install additional asphalt works near to the road within their private properties, the CMC refused to perform additional asphalt works since additional asphalt is not within the project scope. Few residents physically assaulted the CMC and Contractor's staff. As a result (4) people; (2) from subcontractor and (2) from B&V) sustained superficial injuries. Damages also occurred to vehicles and equipment.	The CMC and the Contractor stopped the work and evacuated the site due to safety and security reasons and to avoid further confrontation. Works stopped waiting USAID further instructions.

### Personal Protective Equipment

As a condition of employment, wearing personal protective equipment (PPEs) by each employee was required. All protective equipment were always kept clean and inspected for damage or defect prior to each use. Personal protective equipment was always provided and its use was enforced by every person inside the field. PPE's included hard hats (Helmets), reflective vests, gloves, eyeglasses, hearing protection and safety shoes.

### House Keeping

All Safety devices or furnished safeguards were not allowed to be removed and were protected against destruction. Practicing good housekeeping at the work site was highly encouraged and enforced.

**Cautions:** Safety Concrete jersey barriers, barrels, barricades were used as caution / protection around danger areas. Stop signs, construction area caution signs and other warning signs were used for specific situations. Caution tape and barriers were also utilized. Confined space rules / requirements for the construction of manholes and pipe culverts were enforced.

### Excavation Work

- a) Excavation works were executed in a manner that provided satisfactory access to operating in normal or emergency work.
- b) Excavations were adequately protected against cave-ins by sloping per required standards.
- c) During excavation, when an obstruction was encountered, such as a buried pipe or electric conductor, excavation was stopped immediately and the supervisor made proper identification of the obstruction and suitable arrangements were made before excavation continued.



Figure 4.7: Traffic signs for projects 01 and 02 detours.



Figure 4.8: Directional signs for Projects 01 and 02



Figure 4.9: Directional signs and cones at Projects 01 & 02.



Figure 4.10: Traffic signs at Project 03-SSC.



Figure 4.11: Safety measures and traffic plan implementation at P04- WNV



Figure 4.12: Flashers, new jersey barriers with metal sheets and directional signs at P04- WNV.



Figure 4.13: Flashers and new jersey barriers with metal sheets at P04- WNV.



Figure 4.14: Safety measures at P05- QAL.



Figures 4.15 and 4.16: Safety during night work at P05- QAL – Flashers for equipment, special night lighting, reflective cones and barrels.



Figure 4.17: Protection fence was temporarily installed along Project 02.

Figure 4.18: Barricades, orange fence and other safety measures around retaining walls area at P06- THR.



Figure 4.19: Traffic control plan implementation at Project 07

Figure 4.20: Safety enhancement works (milling) for project 01 detour road.

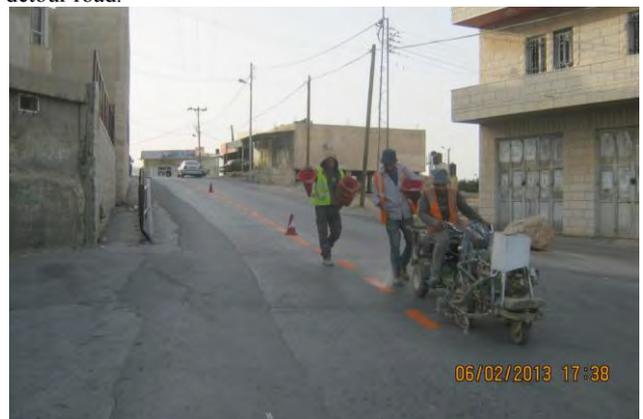


Figure 4.21: Installation of guardrail for detour roads – P02-WJB

Figure 4.22: Temporary road marking for detour roads P01 & P02

## Actual safety / Environmental measures adopted on site

- Dust Control: Dust is produced due to extensive vehicle movement, excavation works and base course laying. To ensure public health, environmental sustainability, safety on site and satisfaction for both labors and residents, water had been sprayed using water tanks on a daily basis or whenever needed, sometimes numerous times a day.
- Warning signs and caution tapes had been installed surrounding the construction areas.
- Workers were instructed to be always cautious during machinery works, and machines were required to be tested and maintained before being used to ensure safety.
- Enforcing traffic control plan on site to manage vehicles flow, access, and ease of maneuverability in addition to providing clear path for pedestrians.
- Replanting, washing and cleaning olive trees.



Figure 4.23: Dust Control– spraying water at Project 01- WJA



Figure 4.24: Dust Control– spraying water at Project 03- SSC



Figure 4.25: Replanting of olive trees at Project 03- SSC



Figure 4.26: Irrigation of replanted olive trees at P03- SSC

## Safety Education

APCO/ArCon provided special safety measures and efforts at all the 7 projects to educate locals and increase their appreciation for safety and possible dangers that may be present. By the end of the projects period residents became more safety conscious and in general more cooperative and aware. Training the school's students about Safety was a priority; APCO/ArCon implemented a special program to make sure students and teachers are clearly aware about Safety as follow:

- 1- Several meetings and Tool Box talks were held at each school with teachers and students to discuss safety issues and students expectations.
- 2- Some Teachers and students were especially trained to become a "Safety Captain" and help other students while entering and leaving their schools.
- 3- At school dismissal times, construction activities came to a halt. CMC, Contractor and Subcontractor staff assisted students navigate construction zone and arrive home safely.

# 5 || TRAFFIC MANAGEMENT

## Traffic Management

Effective management of transportation and free movement during this task order period was first priority. Traffic management is essential to ensure traffic control, detour route for vehicles, and pedestrian safety.

Traffic control plans were prepared for the 7 road projects by competent engineer according to Ma'atz Standards and submitted during the preconstruction phase, traffic control plans were approved by local authorities, Palestinian Higher Transportation, Traffic Department and Police and Israeli related authorities. Approved traffic plans were distributed to all personnel including engineers, safety officer (s), superintendent, traffic department, municipality engineer, and public relation officer.

During construction, approved traffic control plans were adhered to as much as practicable. Each working crew was given the required warning signs, flags and reflecting jackets wherever and whenever required.

Traffic on most of the projects was not highly impacted by the construction operations, parts of the roads were closed for general traffic and traffic flow was diverted to a proposed detour. Safe access for emergency needs, ambulances, fire trucks, and security vehicles in the construction zone was maintained throughout the entire construction period.

Below is a summary of the Traffic Control plan phases for each Project:

### Projects 01 and 02- Wadi Al Jeer- Al Sawahira Al Sharqiya Segments A and B:

The two roads were totally closed for traffic using barriers; however, local residents had temporary access. An emergency lane was provided for local traffic and emergency use during the construction period. Traffic was diverted to existing detour roads through Al Sawahira Al Sharqiya and Al Gharbiya villages. Existing detours were maintained, milling, asphalt patching, and asphalt road widening for some roads was performed, and temporary road marking was installed to increase drivers safety. Detours were also furnished with the required safety devices and signs.



Figure 5.1: Alternative Detour roads for Projects 01 and 02 (WJA and WJB)



Figure 5.2: Safety enhancement works (milling) for project 01 detour road.



Figure 5.3: Installation of guardrail for detour roads – P02-WJB



Figure 5.4: Temporary road marking for detour roads P01 & P02

## Project 03- Al Sawahira Al Sharqiya-Sheikh Sa'ed Road (Segment C)

Road was partially closed (LHS/RHS) from St. C0+000 to St. C0+800 with maintaining emergency lane for residents, while the road was totally closed from St.C0+800 to St.C1+290 utilizing a detour that was opened and rehabilitated by APCO/ArCon.

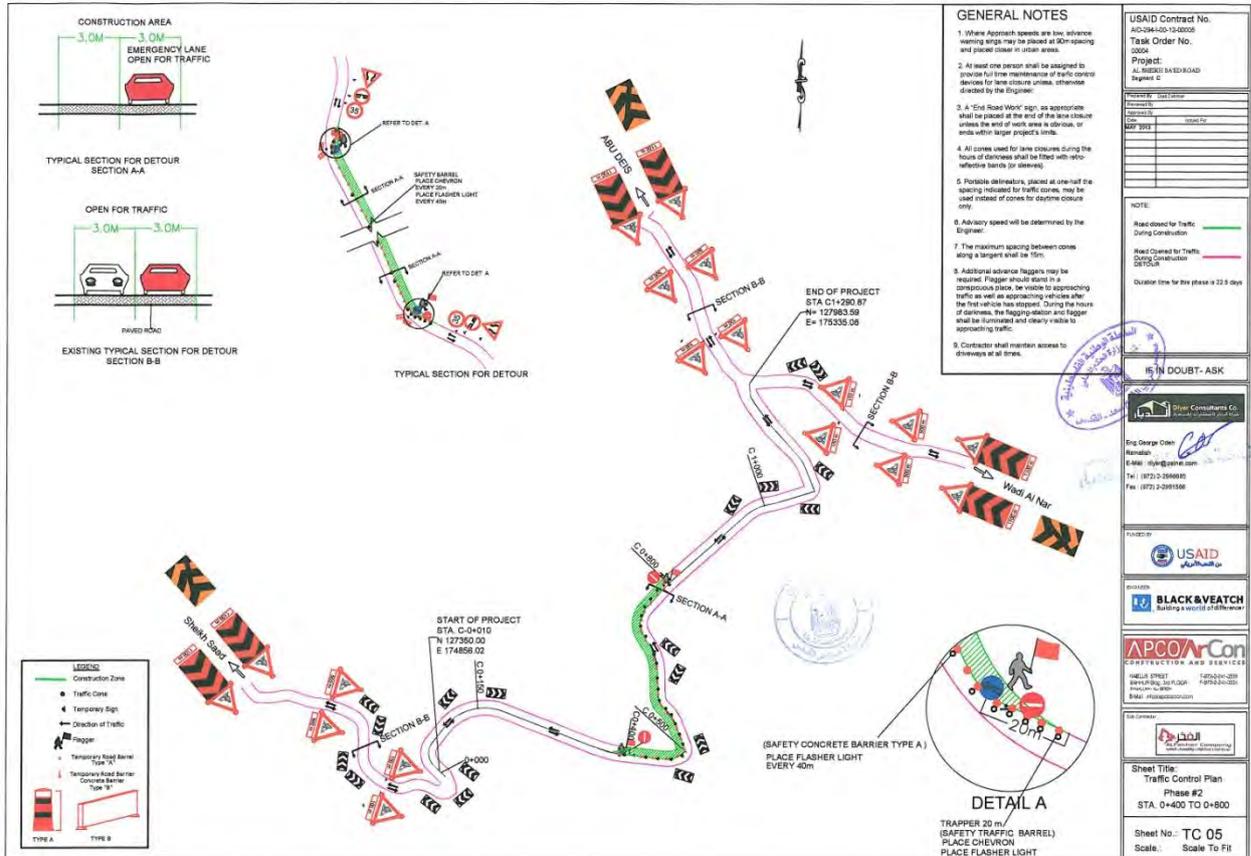


Figure 5.5: Sample sheet of approved traffic control plan for Project 03- with the required approvals and stamps from all related authorities.

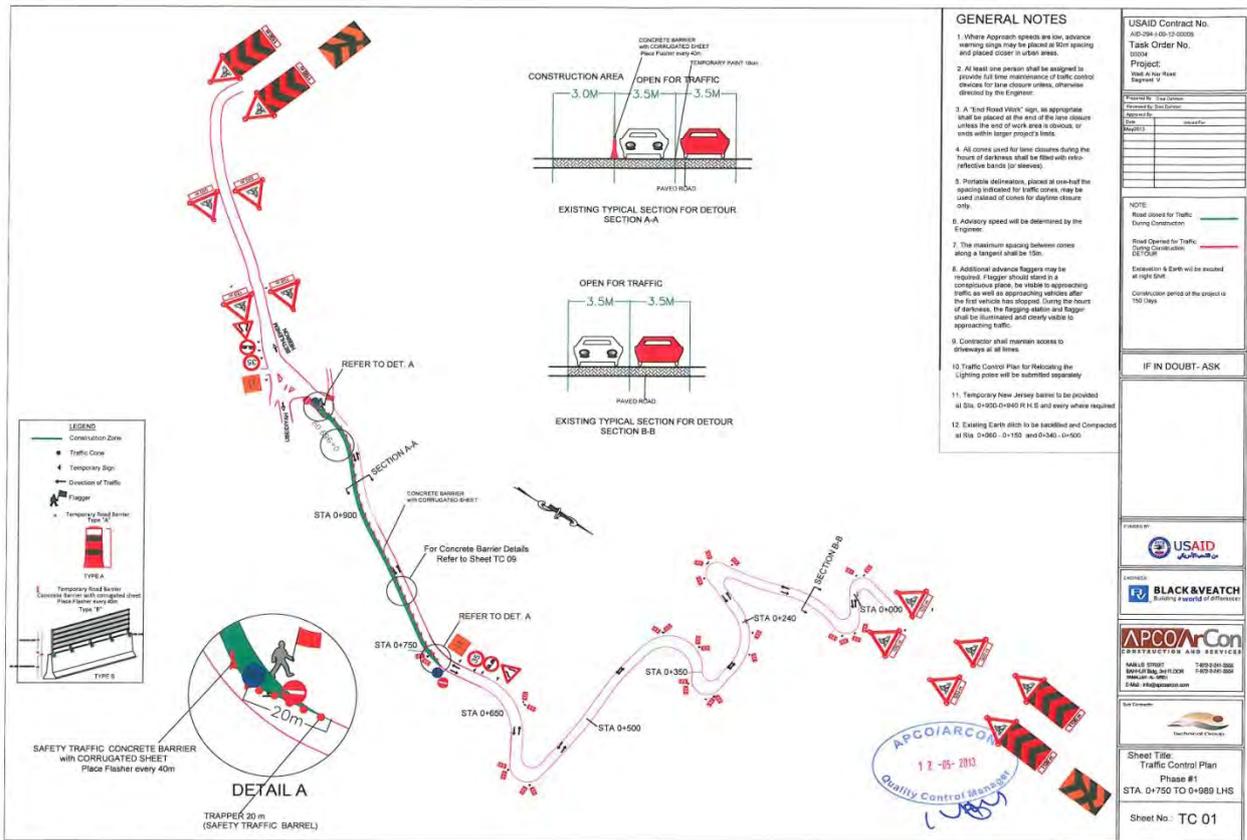
## Project 04- Wadi Al Nar Road (Segment V)

Traffic was maintained at all times by implementing construction LHS/ RHS in stages as follow:

- Phase One from St.C0+750 to St.C0+989 LHS.
- Phase Two from St.C0+500 to St.C0+750 LHS.
- Phase Three from St.C0+240 to St.C0+500 LHS.
- Phase Four from St.C0+000 to St.C0+240 LHS.
- Phase Five from St.C0+750 to St.C0+989 RHS.
- Phase Six from St.C0+500 to St.C0+750 RHS.
- Phase Seven from St.C0+240 to St.C0+500 RHS.
- Phase Eight from St.C0+000 to St.C0+240 RHS.



Figures 5.6: Project 04- WNV- Traffic was maintained at all times by implementing construction LHS/ RHS in stages.

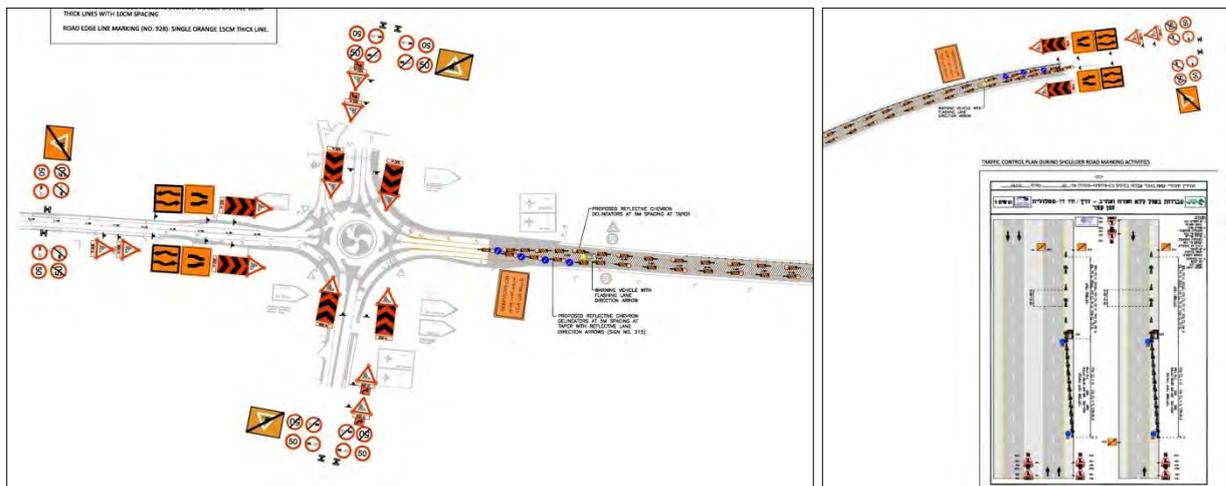


Figures 5.6: Project 04- WNV- Sample sheet of approved traffic control plan.

### Project 05- Qalandiya-Jabaa Road Safety Enhancement

Road was partially closed in phases along the entire length of the construction zone using reflective cones at 20m spacing and traffic was maintained during construction in both directions. The remaining 2 lanes were used as temporary detour for traffic in both directions with 3.6m lane width. A warning vehicle with flashing arrow was positioned at the start of the construction area to direct traffic.

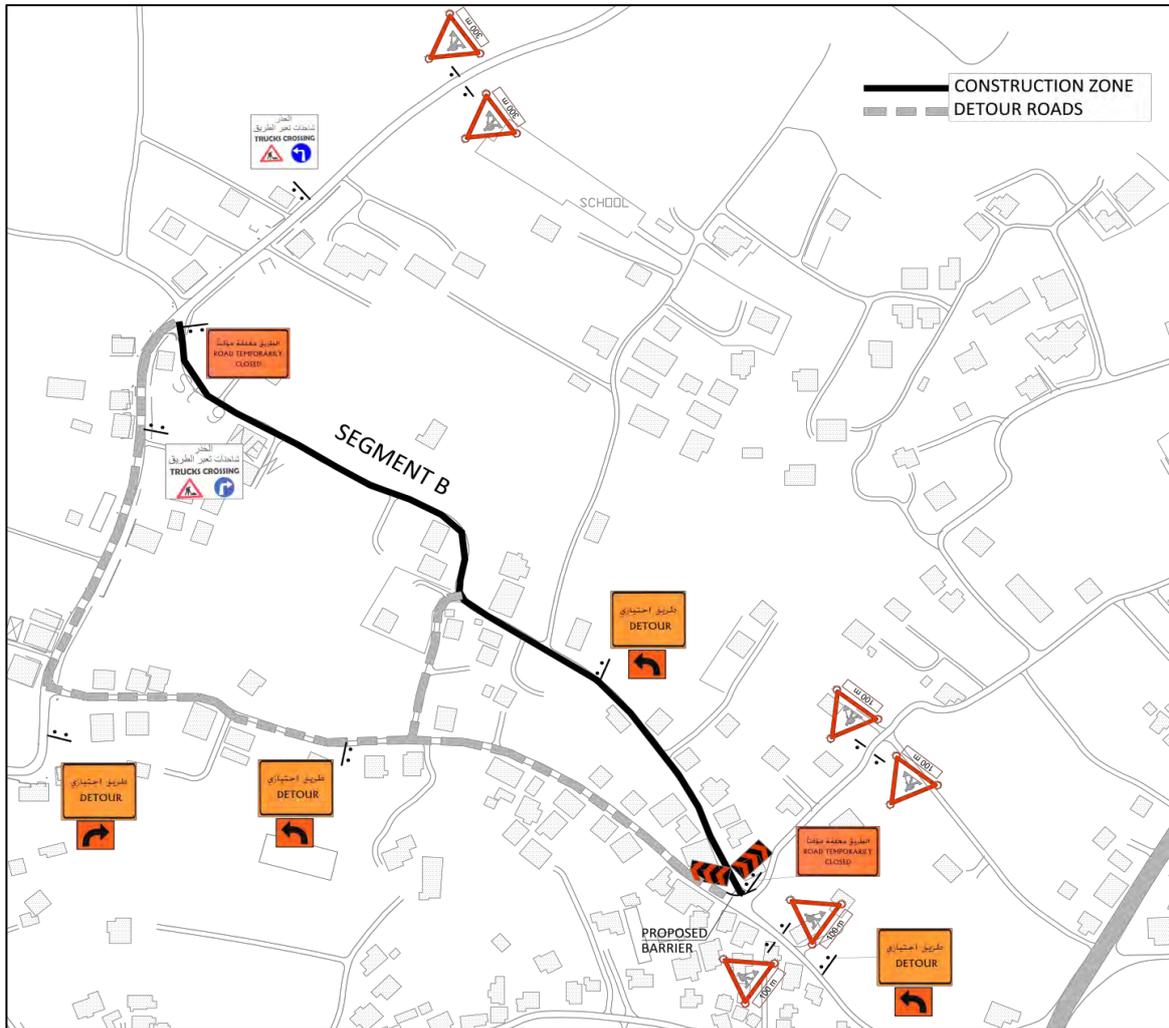
For the installation of the guardrail in the road center and protection curbs on both sides of the guardrail at a distance of 75 offset from the road center. A 6.2m wide construction zone was delineated in the center of the road to enable proper and safe installation of the guardrails and curbs. Construction zone was separated by placing reflective cones at 20m intervals. A warning vehicle with flashing arrow was placed in the construction zone to direct traffic. Cones were tapered along both ends of the construction zone to ensure proper traffic merging. Finally, cones were placed along shoulder edge line when applying shoulder marking on both sides alternately.



Figures 5.7: Project 05- QAL- Sample sheet of approved traffic control plan.

## Project 06- Al Thirwa Schools Road and Roads Retaining Structures

Road segments were totally closed during construction and an emergency lane was maintained for residents, for other road users existing detour roads were provided in each construction phase.

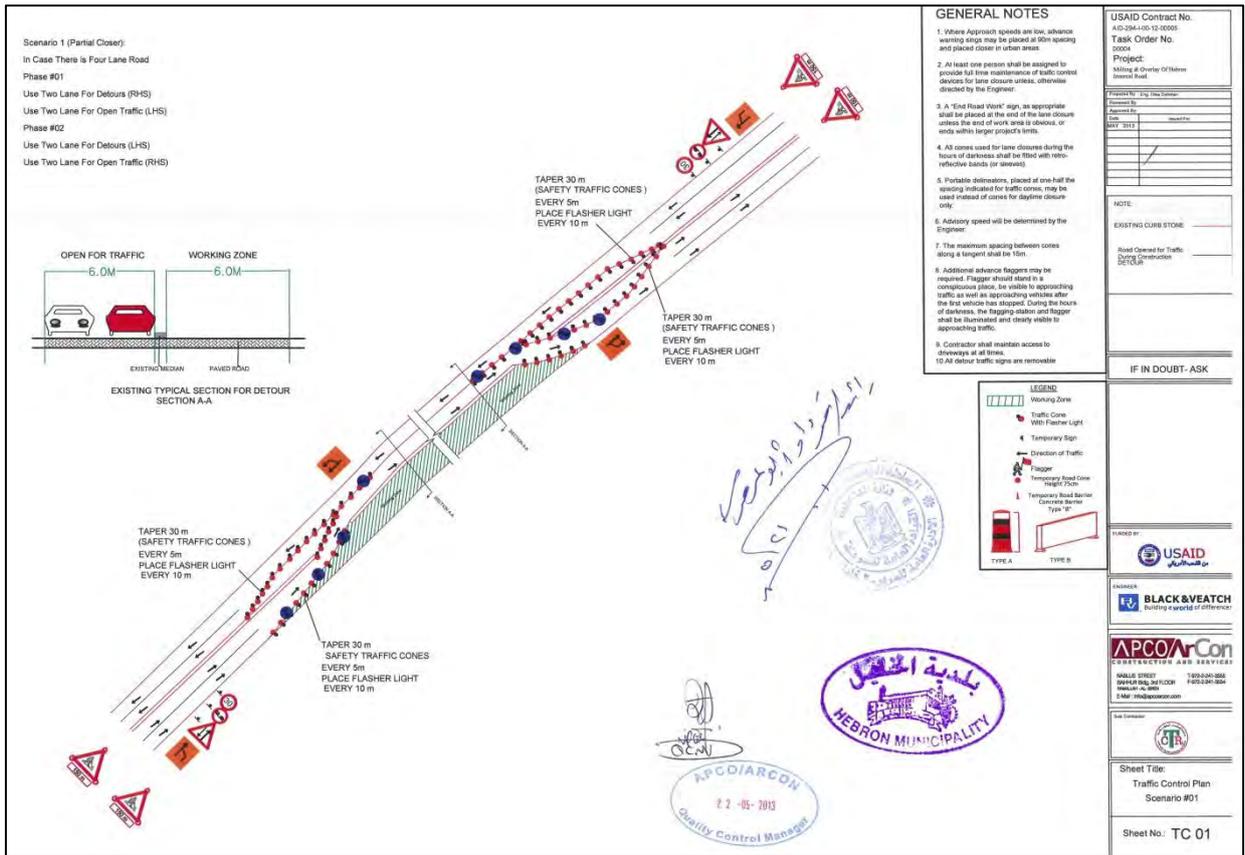


Figures 5.8: Project 06-THR- Sample sheet of approved traffic control plan – Segment B.

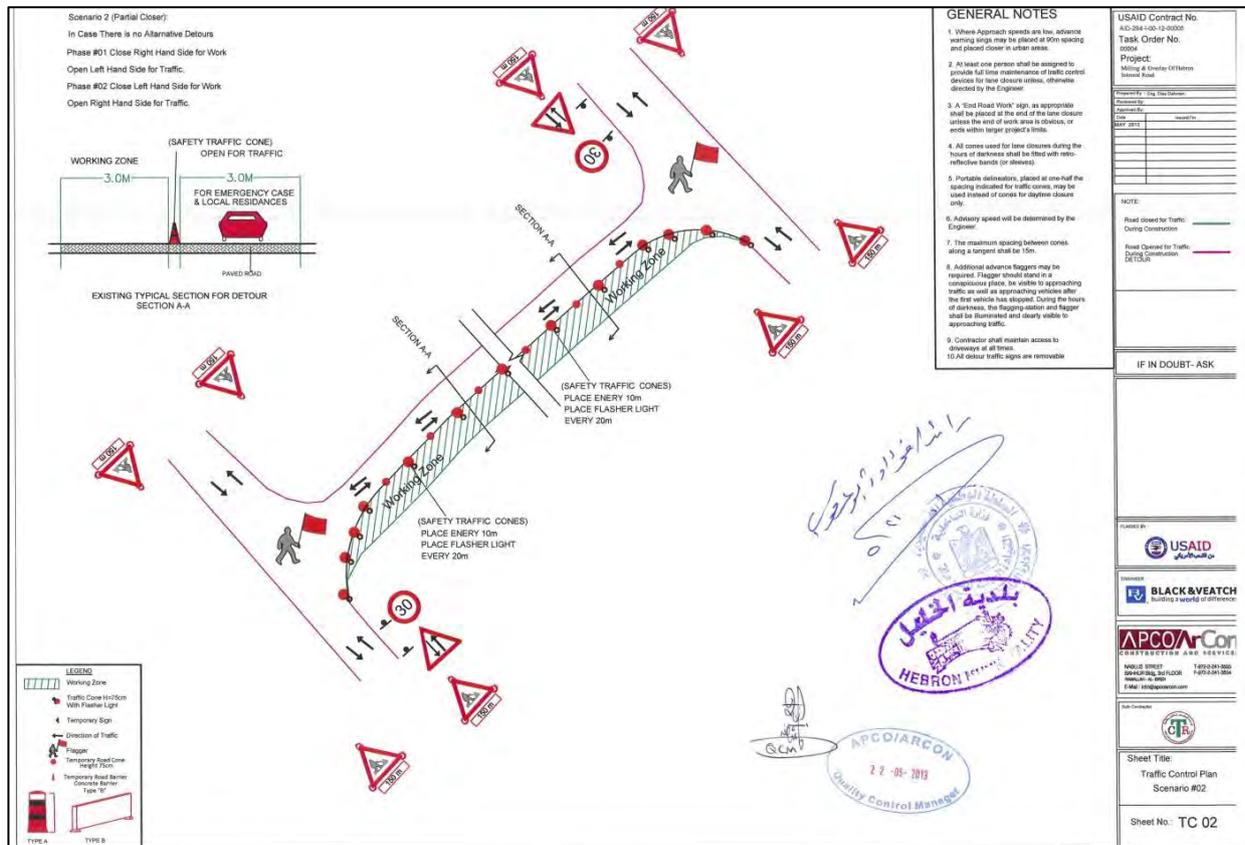
## Project 07- Milling and Overlay of Hebron Internal Roads

Traffic control plans were prepared according to each internal road condition; the following three traffic plan scenarios were implemented:

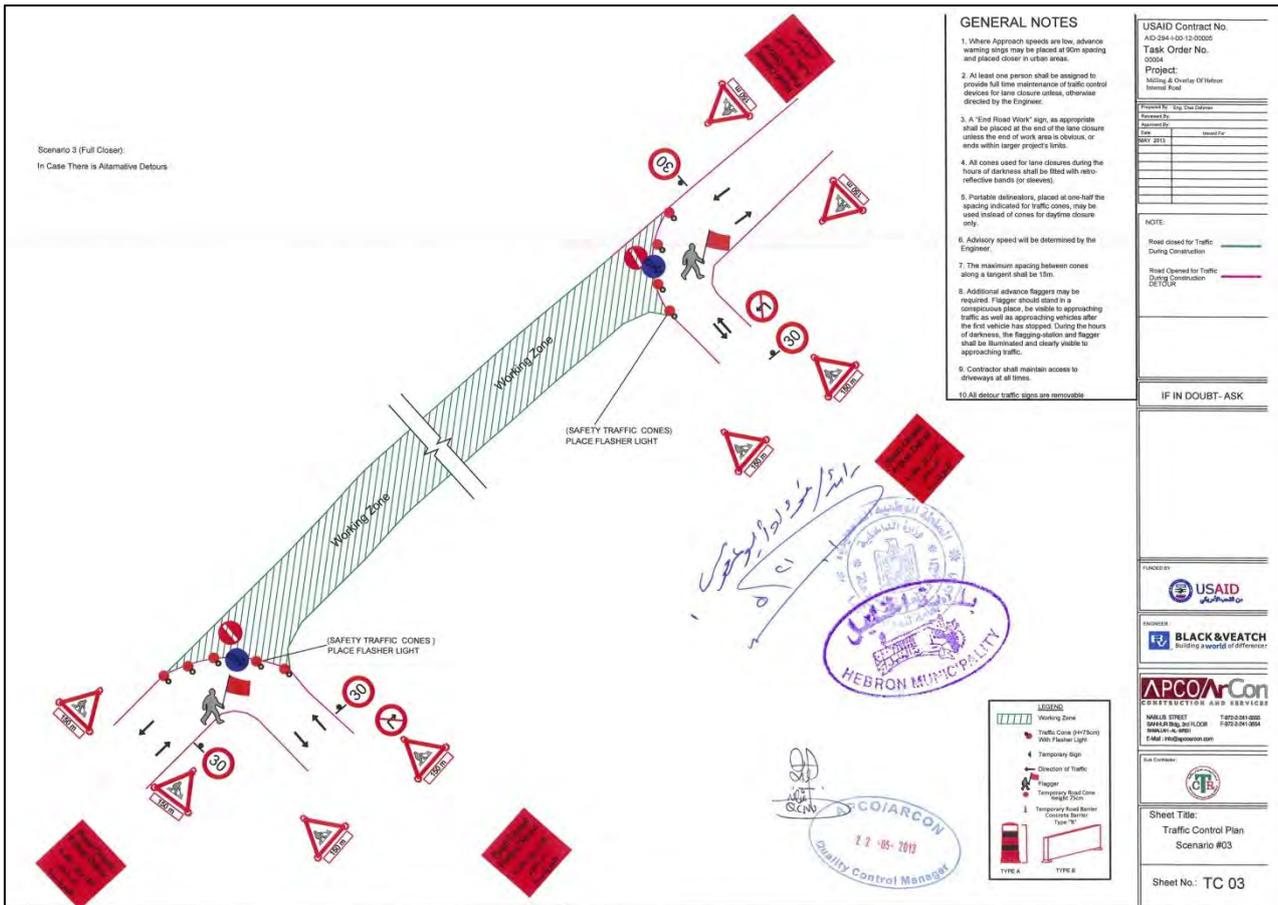
- 1- **LHS/RHS for Four lane road:** work was conducted LHS/RHS utilizing 2 lanes as temporary detour for both directions and conducting the construction works in the other 2 lanes.
- 2- **Partial closure for roads when no alternative detours were available:** works were conducted RHS/LHS while maintaining an emergency access for residents all the time.
- 3- **Total close:** when existing local roads were available as temporary detours.



Figures 5.9: Project 07-HEB- Sample sheet of approved traffic control plan – LHS/RHS for 4 lane road.



Figures 5.10: Project 07-HEB- Sample sheet of approved traffic control plan – Partial closure for roads when no alternative detours were available.



Figures 5.11: Project 07-HEB- Sample sheet of approved traffic control plan – Total close: when existing local roads were available as temporary detours.

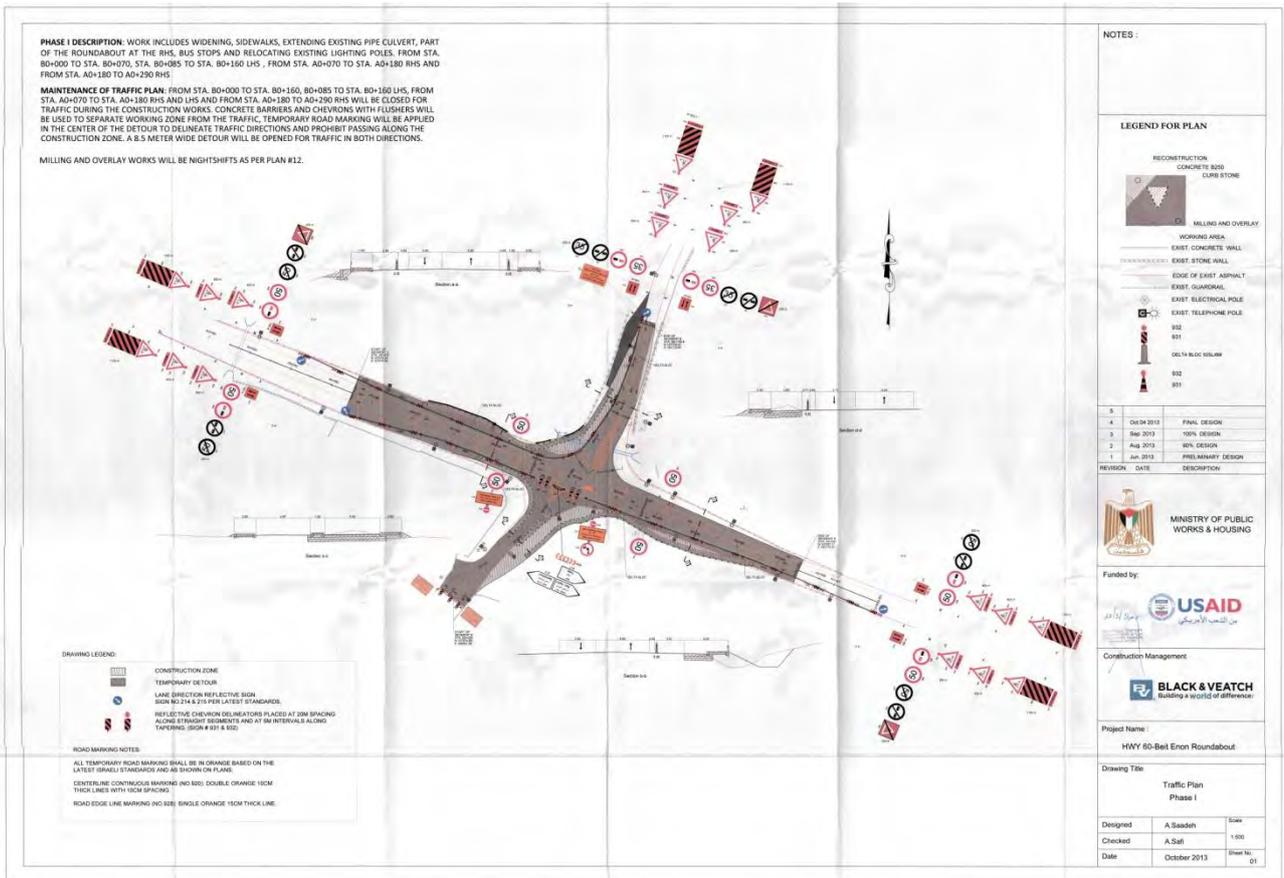
### Project 07- Beit Enoon Roundabout

Traffic Control plan for Beit Enoon Roundabout Intersection was implemented in 3 phases as detailed below:

**Phase 01:** Road segments from St. B0+000 to St. B0+160, B0+085 to St. B0+160 LHS, from St. A0+070 to St. A0+180 RHS and LHS, and from St. A0+180 to St. A0+290 RHS were closed for traffic during the construction works. Concrete barriers and chevrons with flashers were used to separate working zone from the traffic, temporary road marking was applied in the center of the detour to delineate traffic directions and prohibit passing along the construction zone. A 8.5 meter wide detour was opened for traffic in both directions.

**Phase 02:** Road segments from St. A0+140 to St. B0+160, and from St. A0+140 TO St. A0+280 LHS were closed for traffic during the construction works. Concrete barriers and chevrons with flashers were used to separate working zone from the traffic, temporary road marking was applied in the center of the detour to delineate traffic directions and prohibit passing along the construction zone. A 7.0 meter wide detour was opened for traffic in both directions.

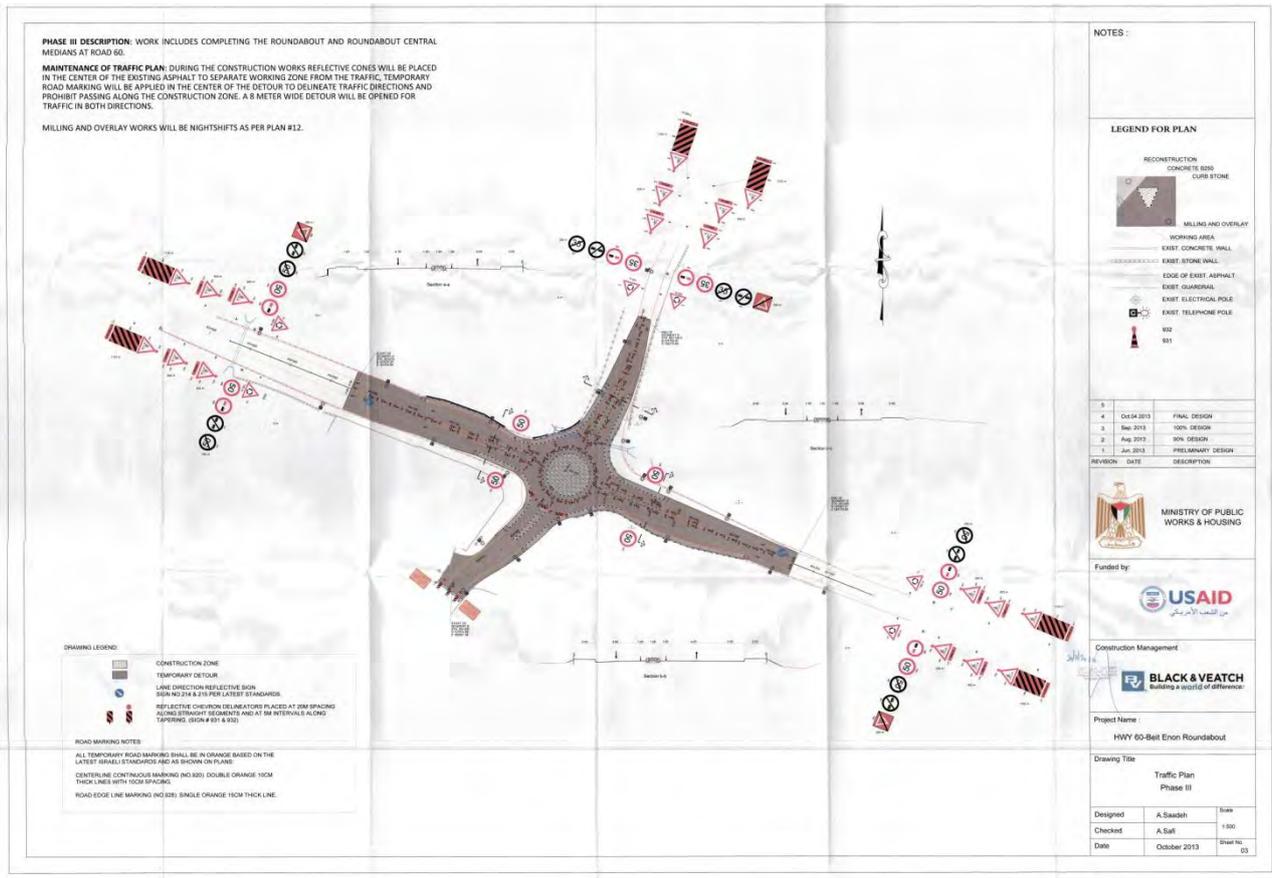
**Phase 03:** during the construction of the roundabout central median at Road 60, reflective cones were placed in the center of the existing asphalt to separate working zone from the traffic, temporary road marking was applied in the center of the detour to delineate traffic directions and prohibit passing along the construction zone. A 8.0 meter wide detour was opened for traffic in both directions.



Figures 5.12: Project 07-HEB- Beit Enoon Roundabout – approved traffic control plan – Phase I.



Figures 5.13: Project 07-HEB- Beit Enoon Roundabout – approved traffic control plan – Phase II.



Figures 5.14: Project 07-HEB- Beit Enoon Roundabout – approved traffic control plan – Phase III.

## 6 || QUALITY CONTROL PROGRAM

## Quality Control Program

Quality control is a team effort. The team includes the APCO/ArCon in-house management, support staff in the USA, West Bank and the on-site personnel who implemented the quality control program.

The APCO/ArCon staff provided guidance and oversight for the on-site execution of the quality control tasks.

APCO/ArCon’s Project Quality Control manager and his assistance checked quality of work on daily basis. Scheduled and requested testing, monitored test sampling / results and reported directly to the QC Manager in the main office. The project quality control manager enforced the quality control program to include, QC functions, daily QC reports, coordination with CMC for pre-final and final inspections, and assured that the QC program is adhered to at every stage of the project.

## TESTS

All required testing was coordinated with the CMC representative on site. The project quality control manager verified that the testing procedures comply with contract specifications or regulatory requirements. Also made sure that all tests are carried out, both passing and failing, are recorded on the quality control report including the dates the tests are conducted (Table 6.1 summarizes the Tests Log). Test results were submitted by laboratory to subcontractor, APCO/ArCon and CMC simultaneously. Attached to this report - Appendix D- testing log sheets carried out for the project and Appendix G detail all the Inspection Requests.

As indicated in table 6.1, tests that did not meet specified standards triggered re-work of the affected works to achieve the standard of quality required by the contract documents.

The testing crew executed test sampling in the presence of the subcontractor supervisor, APCO/ArCon QC Manager and the CMC Representative. The testing laboratory was required to submit the test results regardless of outcome simultaneously to the CMC, APCO/ArCon and the subcontractor.

During the construction period of the 7 projects one Non compliance Report was issued as the following:

**Table 6.1: NCR Log**

Date	Number	Subject	Corrective Action	Correction Date
January 15, 2014	NCR-13-00004-MRS-E-C-001	Project 07- Defective asphalt at Ein Sara road. 1-The joints between the old and new pavement are not performed properly. 2-Visual observations of loose mix (no bond), and high roughness at the paved layer.	Corrective actions (different scenarios) were discussed with the CMC, the contractor rectified all mentioned locations and performed milling and overlay for the total length of Ein Sara road. On Jan. 25, 2014 USAID COR sent email rejecting manhole adjustments, thermoplastic paint and asphalt joints due to poor workmanship. APCO/ArCon rectified manholes and curbstone painting by employing additional resources (labor and painters for hand detailing of the paint and manhole adjustments) on Jan. 26, 2014.	APCO started working on correction measures immediately as detailed under the corrective action; official correction report was submitted to CMC on Jan. 26, 2014.



Figure 6.1: Subgrade Compaction Test -Project 01.



Figure 6.2: Subgrade Field density test – Project 03



Figure 6.3: Basecourse Field density test – Project 03



Figure 6.4: Asphalt Core Test – Project 01



Figure 6.5: Water Pressure Test– Project 01



Figure 6.6: Asphalt Core Test – Project 01



Figure 6.7: Basecourse Field density test – Project 07



Figure 6.8: Asphalt plates verification test – Project 07

Table 6.2: Tests Log summary table.

<b>Material Description</b>	<b>Test description</b>	<b>Number of tests</b>	<b>Pass</b>	<b>Fail</b>	<b>Notes (Action taken for failed tests)</b>
<b>Project 01- WJA</b>					
Base-course	Comprehensive	2	2	0	
Base-course-1 <sup>st</sup> layer	Comprehensive	11	7	4	New tests conducted, failed materials were removed from site.
Base-course-2 <sup>nd</sup> layer	Comprehensive	6	6	0	
Base-course	Source Verification Quality Control	2	2	0	
Sub-grade	Modified Proctor	18	13	5	
Sub-grade	Field density	16	16	0	
Base-course	Field density	2	2	0	
Base-course-1 <sup>st</sup> layer	Field density	20	18	2	Failed areas were re-worked, re-tested and passed.
Base-course-2 <sup>nd</sup> layer	Field density	13	12	1	Failed areas were re-worked, re-tested and passed.
Topping material	Field density	4	3	1	Failed areas were re-worked, re-tested and passed
Topping material 1 <sup>st</sup> layer	Field density	2	2	0	
Topping material 2 <sup>nd</sup> layer	Field density	2	2	0	
Fill material	Field density	3	3	0	
Fill material 2 <sup>nd</sup> layer	Field density	2	2	0	
Fill material 3 <sup>rd</sup> layer	Field density	2	2	0	
Fill material 4 <sup>th</sup> layer	Field density	2	2	0	
Fill material 5 <sup>th</sup> layer	Field density	2	2	0	
Fill material 6 <sup>th</sup> layer	Field density	1	1	0	
Topping material	Comprehensive	2	2	0	
Topping material	Modified Proctor	1	1	0	
Topping material 1 <sup>st</sup> layer	Modified Proctor	1	1	0	
Fill material	Modified Proctor	3	3	0	
Fill material 2 <sup>nd</sup> layer	Modified Proctor	1	1	0	
Fill material 3 <sup>rd</sup> layer	Modified Proctor	1	1	0	
Fill material 5 <sup>th</sup> layer	Modified Proctor	1	1	0	
Asphalt (Binder Layer)	Bituminous Paving Mixture	12	12	0	
	Core Test	2	2	0	
Asphalt (Wearing Layer)	Bituminous Paving Mixture	10	10	0	
	Core Test	1	1	0	

Material Description	Test description	Number of tests	Pass	Fail	Notes (Action taken for failed tests)
Asphalt	Prime Coat	4	4	0	
	Tack Coat	1	1	0	
Sub-grade	Soil Classification	1	-	-	
Concrete ( 7 days )	Compressive strength	13	13	0	
Concrete ( 28 days )	Compressive strength	21	21	0	
Steel Reinforcing Bars	Comprehensive	1	1	0	
Water Pipeline	Microbiology test	1	1	0	
<b>Project 02- WJB</b>					
Base-course-1 <sup>st</sup> layer	Field density	3	3	0	
Base-course-1 <sup>st</sup> layer	Comprehensive	1	1	0	
Base-course-2 <sup>nd</sup> layer	Field density	2	1	1	Re-worked, re-tested and passed
Sub-grade	Field density	7	5	2	Re-worked, re-tested and passed
Sub-grade	Modified Proctor	5	5	0	
Concrete ( 7 days )	Compressive strength	6	6	0	
Concrete ( 28 days )	Compressive strength	20	20	0	
Water Pipeline	Pressure test	1	1	0	
	Microbiology test	1	1	0	
Asphalt	Core test	1	1	0	
	Bituminous Paving Mixture	1	1	0	
<b>Project 03- SSC</b>					
Base-course	Comprehensive	1	1	0	
Sub-grade	Modified Proctor	8	8	0	
Sub-grade	Field density	13	9	4	Failed areas were re-worked, re-tested and passed
Rock fill material	Classification	2	2	0	
Concrete ( 7 days )	Compressive strength	19	19	0	
Concrete ( 28 days )	Compressive strength	19	19	0	
Topping material	Field density	4	4	0	
Topping material	Comprehensive	1	1	0	
Base-course-1 <sup>st</sup> layer	Field density	11	10	1	Failed areas were re-worked, re-tested and passed.
Base-course	Field density	3	3	0	
Base-course-1 <sup>st</sup> layer	Comprehensive	3	3	0	

<b>Material Description</b>	<b>Test description</b>	<b>Number of tests</b>	<b>Pass</b>	<b>Fail</b>	<b>Notes (Action taken for failed tests)</b>
Base-course-2 <sup>nd</sup> layer	Field density	7	6	1	Failed areas were re-worked, re-tested and passed.
Base-course-2 <sup>nd</sup> layer	Comprehensive	3	3	0	
Asphalt	Prime Coat	4	4	0	
	Tack Coat	1	1	0	
	Core Test	1	1		
	Bituminous Paving Mixture	3	3	0	
Water Pipeline	Pressure Test	1	1	0	
	Microbiology test	1	1	0	
Steel Reinforcing Bars	Comprehensive	3	3	0	
Sewer Drainage Pipe	Asbestos Inspection	1	1	0	
Thermoplastic	Core	1	1	0	
Concrete	Core	1	1	0	
<b>Project 04- WNV</b>					
Sub-grade	Modified Proctor	6	6	0	
Sub-grade	Field density	6	6	0	
Base-course-1 <sup>st</sup> layer	Comprehensive	2	2	0	
Base-course-2 <sup>nd</sup> layer	Comprehensive	2	2	0	
Base-course-1 <sup>st</sup> layer	Field density	8	8	0	
Base-course-2 <sup>nd</sup> layer	Field density	7	6	1	Failed areas were re-worked, re-tested and passed
Concrete ( 7 days )	Compressive strength	2	2	0	
Concrete ( 28 days )	Compressive strength	3	3	0	
Asphalt (Binder Layer )	Bituminous Paving Mixture	7	7	0	
Base-course-1 <sup>st</sup> layer	Modified Proctor	1	1	0	
Base-course-2 <sup>nd</sup> layer	Modified Proctor	1	1	0	
Asphalt	COR test	2	1	1	Failed areas were re-worked, re-tested and passed.
	Prime coat	1	1	0	
<b>Project 05- QAL</b>					
Thermoplastic Paint	Thickens test	2	2	0	
Asphalt (Wearing)	Bituminous Paving Mixture	2	2	0	
Asphalt	Core test	1	1	0	

<b>Material Description</b>	<b>Test description</b>	<b>Number of tests</b>	<b>Pass</b>	<b>Fail</b>	<b>Notes (Action taken for failed tests)</b>
<b>Project 06- THR</b>					
Soil Foundation under gravity Retaining Wall	Bearing Capacity	1	1	0	
Soil Foundation under gravity Retaining Wall	Proctor	1	1	0	
Sub-grade	Field density	12	9	3	Failed tests were reworked retested and passed.
Base-course	Proctor	1	1	0	
Base-course	Field density	9	9	0	
Concrete ( 7 days )	Compressive strength	5	5	0	
Concrete ( 28 days )	Compressive strength	26	26	0	
Base-course-1 <sup>st</sup> layer	Field density	7	7	0	
Base-course- 2 <sup>nd</sup> layer	Field density	3	3	0	
Sub-grade	Modified Proctor	6	6	0	
Soil	Geo-technical	1	-	-	
Base-course- 4 <sup>th</sup> layer	Field density	2	1	1	Re-worked, re-tested and passed.
Base-course-1 <sup>st</sup> layer	Comprehensive	2	2	0	
Base-course-1 <sup>st</sup> layer	Quality Assurance	1	1	0	
Base-course-2 <sup>nd</sup> layer	Comprehensive	1	1	0	
Asphalt	Core Test	4	3	1	Failed test was retested & passed.
Water Pipeline (2" & 4")	Microbiology Test	1	1	0	
Curbstone	Compression	1	1	-	
<b>Project 07- HEB</b>					
Base-course	Comprehensive	4	4	0	
Base-course	Field density	7	7	0	
Base course 1 <sup>st</sup> layer	Field density	2	2	0	
Topping material 1 <sup>st</sup> layer	Field density	1	1	0	
Topping material 2 <sup>nd</sup> layer	Field density	1	1	0	
Concrete (28 days )	Comprehensive	10	10	0	
Sub-grade	Modified Proctor	2	2	0	
Sub-grade	Soil Classification	1	1	0	
	Field density	3	3	0	

Material Description	Test description	Number of tests	Pass	Fail	Notes (Action taken for failed tests)
Asphalt patching	Bituminous Paving Mixture	2	2	0	
Asphalt wearing	Bituminous Paving Mixture	45	43	2	Asphalt plates verification tests were conducted for failed areas and passed.
Asphalt	Core test	18	13	5	The failed test samples were retested and passed.
	Tack coat	2	2	0	
Curbstone	Compression	1	1	0	
Interlock Tiles		1	1	0	
Asphalt	Plate	3	3	0	

**Note:** The areas where degree of compaction did not meet specified requirements were reworked, re-compacted and re-tested to satisfy requirements.

# 7 || SITE FACILITIES

## Site Facilities

During the road construction, facilities were provided to assist workers, engineers and all staff to accomplish their job with maximum effectiveness. Field office services (one primary office and 2 secondary offices) were provided including electricity, telephone services and internet connections. Office Furniture was provided as required by the contract documents.

The fully furnished and equipped office facilities were essential to accomplish the work tasks and manage the onsite construction operations. Approved storage, staging and dumping locations were used during the construction phase. Lists for the nearest hospital, clinic, civil defense and police centers with full contact information were provided to CMC, subcontractor's prior starting construction. Portable toilets also were provided at the Field.

Other housekeeping facilities were provided as needed and required for the various construction activities.

<u>Site Office</u>	<u>Location</u>	<u>Coordinates</u>	<u>Area</u>	<u>Period of occupancy</u>
Primary office	Beit Sahour	N: 122901 E: 171995	160 sq.m	05-May-2013 up to 31-Dec-2013
Secondary office 01	Al Sawahira	N: 127657 E: 176846	130 sq.m	01-May -2013 up to 31-Dec-2013
Secondary office 02	Hebron	N: 105710 E: 158655	150 sq.m	01-May-2013 up to 02-Mar-2014



Figure 7.1: Primary office meeting room.



Figure 7.2: Primary office- office room.



Figure 7.3: Primary office bathroom.



Figure 7.4: Primary office kitchen.



Figure 7.5: Secondary office 1- Lobby



Figure 7.6: Secondary office 1- office room



Figure 7.7: Secondary office 1- kitchen.



Figure 7.8: Secondary office 1- bathroom.



Figure 7.9: Secondary office 2- office room.



Figure 7.10: Secondary office 2- office room.

## 8 || VARIATION ORDERS (VO), VORs AND PAYMENTS

## Variation Orders issued and Variation Order Requests

During the project period, twenty variation orders were submitted and approved by USAID as follows:

**Table 8.1: VARIATION ORDERS LOG**

VO No.	DESCRIPTION	VO Status (AP/PE/RE/RJ)			Date Sent to B&V	USAD Approval Date	Variation order Amount	Time Ex. Days	Previous BOQ line items	Revised BOQ line item	Previous Day work amount	Revised Day work amount	Previous Completion Date	Revised Completion Date
		APCO	B&V	USAID										
01	Replacing stone boulder in project #3 (SSC) from Sta. C0+936 to C1+057 with gravity wall	AP	AP	AP	June 13, 2013	June 20, 2013	16,000	---	\$12,945,234.75	\$12,961,234.75	\$700,000.00	\$684,000.00	P01- Nov. 10, 2013 P02- Sep. 11, 2013 P03- Oct. 11, 2013 P04- Sep. 11, 2013 P05- Aug. 12, 2013 P06- Oct. 11, 2013 P07- Nov. 10, 2013	P01- Nov. 10, 2013 P02- Sep. 11, 2013 P03- Oct. 11, 2013 P04- Sep. 11, 2013 P05- Aug. 12, 2013 P06- Oct. 11, 2013 P07- Nov. 10, 2013
02	New definitive quantities and new items for projects 2,3,4,5 and 6 Time Extension for Project 3.	AP	AP	AP	June 30, 2013	July 03, 2013	(70,605.25)	P#3=25	\$12,961,234.75	\$12,890,628.75	\$684,000.00	\$754,605.25	P01- Nov. 10, 2013 P02- Sep. 11, 2013 P03- Oct. 11, 2013 P04- Sep. 11, 2013 P05- Aug. 12, 2013 P06- Oct. 11, 2013 P07- Nov. 10, 2013	P01- Nov. 10, 2013 P02- Sep. 11, 2013 P03- Nov. 05, 2013 P04- Sep. 11, 2013 P05- Aug. 12, 2013 P06- Oct. 11, 2013 P07- Nov. 10, 2013
03	New definitive quantities, additional topping and water pipelines and time extensions.	AP	AP	AP	August 01, 2013	August 09, 2013	435,910	P#1 =21 P#2 =21 P#3=21 P#4=14 P#5=14	\$12,890,628.75	\$13,326,538.75	\$754,605.25	\$318,695.25	P01- Nov. 10, 2013 P02- Sep. 11, 2013 P03- Nov. 05, 2013 P04- Sep. 11, 2013 P05- Aug. 12, 2013 P06- Oct. 11, 2013 P07- Nov. 10, 2013	P01- Dec. 01, 2013 P02- Oct. 02, 2013 P03- Nov. 26, 2013 P04- Sep. 25, 2013 P05- Aug. 26, 2013 P06- Oct. 11, 2013 P07- Nov. 10, 2013
04	New definitive quantities, Project #5	AP	AP	AP	August 01, 2013	August 26, 2013	18,037.96	---	\$13,326,538.75	\$13,344,576.71	\$318,695.25	\$300,657.29	P01- Dec. 01, 2013 P02- Oct. 02, 2013 P03- Nov. 26, 2013 P04- Sep. 25, 2013 P05- Aug. 26, 2013 P06- Oct. 11, 2013 P07- Nov. 10, 2013	P01- Dec. 01, 2013 P02- Oct. 02, 2013 P03- Nov. 26, 2013 P04- Sep. 25, 2013 P05- Aug. 26, 2013 P06- Oct. 11, 2013 P07- Nov. 10, 2013
05	New items and new definitive quantities.	AP	AP	AP	Sept. 05, 2013	Sept. 09, 2013	94,121.90	---	\$13,344,576.71	\$13,438,698.61	\$300,657.29	\$206,535.39	P01- Dec. 01, 2013 P02- Oct. 02, 2013 P03- Nov. 26, 2013 P04- Sep. 25, 2013 P05- Aug. 26, 2013 P06- Oct. 11, 2013 P07- Nov. 10, 2013	P01- Dec. 01, 2013 P02- Oct. 02, 2013 P03- Nov. 26, 2013 P04- Sep. 25, 2013 P05- Aug. 26, 2013 P06- Oct. 11, 2013 P07- Nov. 10, 2013

VO No.	DESCRIPTION	VO Status (AP/PE/RE/RJ)			Date Sent to B&V	USAD Approval Date	Variation order Amount	Time Ex. Days	Previous BOQ line items	Revised BOQ line item	Previous Day work amount	Revised Day work amount	Previous Completion Date	Revised Completion Date
		APCO	B&V	USAID										
06	New items and time extension at projects 1, 2, 4 and 6	AP	AP	AP	Sept. 23, 2013	Sept. 24, 2013	(17,240.00)	P#1 =14 P#2 =10 P#4=14 P#6=21	\$13,438,698.61	\$13,421,458.61	\$206,535.39	\$223,775.39	P01- Dec. 01, 2013 P02- Oct. 02, 2013 P03- Nov. 26 , 2013 P04- Sep. 25, 2013 P05- Aug. 26, 2013 P06- Oct. 11, 2013 P07- Nov. 10, 2013	P01- Dec. 15, 2013 P02- Oct. 12, 2013 P03- Nov. 26 , 2013 P04- Oct. 09, 2013 P05- Aug. 26, 2013 P06- Nov. 01, 2013 P07- Nov. 10, 2013
07	New items and final definitive quantities for project 2 and project 4	AP	AP	AP	Oct. 07, 2013	Oct. 08, 2013	(59,158.16)	---	\$13,421,458.61	\$13,362,300.45	\$223,775.39	\$282,933.55	P01- Dec. 15, 2013 P02- Oct. 12, 2013 P03- Nov. 26 , 2013 P04- Oct. 09, 2013 P05- Aug. 26, 2013 P06- Nov. 01, 2013 P07- Nov. 10, 2013	P01- Dec. 15, 2013 P02- Oct. 12, 2013 P03- Nov. 26 , 2013 P04- Oct. 09, 2013 P05- Aug. 26, 2013 P06- Nov. 01, 2013 P07- Nov. 10, 2013
08	New Definitive Quantities and New items at Project 1 and Final Definitive Quantities and New items at Project 6	AP	AP	AP	Oct. 30, 2013	Oct. 31, 2013	55,772.41	---	\$13,362,300.45	\$13,418,072.86	\$282,933.55	\$227,161.14	P01- Dec. 15, 2013 P02- Oct. 12, 2013 P03- Nov. 26 , 2013 P04- Oct. 09, 2013 P05- Aug. 26, 2013 P06- Nov. 01, 2013 P07- Nov. 10, 2013	P01- Dec. 15, 2013 P02- Oct. 12, 2013 P03- Nov. 26 , 2013 P04- Oct. 09, 2013 P05- Aug. 26, 2013 P06- Nov. 01, 2013 P07- Nov. 10, 2013
09	New Definitive Quantities and Beit Enon Roundabout	AP	AP	AP	Nov. 6, 2013	Nov. 08, 2013	58,900.02	P#7= 45	\$13,418,072.86	\$13,476,972.88	\$227,161.14	\$168,261.12	P01- Dec. 15, 2013 P02- Oct. 12, 2013 P03- Nov. 26 , 2013 P04- Oct. 09, 2013 P05- Aug. 26, 2013 P06- Nov. 01, 2013 P07- Nov. 10, 2013	P01- Dec. 15, 2013 P02- Oct. 12, 2013 P03- Nov. 26 , 2013 P04- Oct. 09, 2013 P05- Aug. 26, 2013 P06- Nov. 01, 2013 P07- Dec. 25, 2013
10	Interim Time Extension for Project 03	AP	AP	AP	Nov. 25, 2013	Nov. 26, 2013	0	P#3= 7	\$13,476,972.88	\$13,476,972.88	\$168,261.12	\$168,261.12	P01- Dec. 15, 2013 P02- Oct. 12, 2013 P03- Nov. 26 , 2013 P04- Oct. 09, 2013 P05- Aug. 26, 2013 P06- Nov. 01, 2013 P07- Dec. 25, 2013	P01- Dec. 15, 2013 P02- Oct. 12, 2013 P03- Dec. 03 , 2013 P04- Oct. 09, 2013 P05- Aug. 26, 2013 P06- Nov. 01, 2013 P07- Dec. 25, 2013
11	Time Extension for Project 03	AP	AP	AP	Dec. 02, 2013	Dec. 03, 2013	0	P#3= 14	\$13,476,972.88	\$13,476,972.88	\$168,261.12	\$168,261.12	P01- Dec. 15, 2013 P02- Oct. 12, 2013 P03- Dec. 03 , 2013 P04- Oct. 09, 2013 P05- Aug. 26, 2013 P06- Nov. 01, 2013 P07- Dec. 25, 2013	P01- Dec. 15, 2013 P02- Oct. 12, 2013 P03- Dec. 17, 2013 P04- Oct. 09, 2013 P05- Aug. 26, 2013 P06- Nov. 01, 2013 P07- Dec. 25, 2013

VO No.	DESCRIPTION	VO Status (AP/PE/RE/RJ)			Date Sent to B&V	USAD Approval Date	Variation order Amount	Time Ex. Days	Previous BOQ line items	Revised BOQ line item	Previous Day work amount	Revised Day work amount	Previous Completion Date	Revised Completion Date
		APCO	B&V	USAID										
12	New Items, Final Definitive Quantity and Time Extension for Project 1 and Project 3 New Items, New In-definitive Quantity and Time Extension for Project 7	AP	AP	AP	Dec. 12, 2013	Dec. 13, 2013	71,984.43	P#1 =5 P#3=5 P#7=5	\$13,476,972.88	\$13,548,957.31	\$168,261.12	\$96,276.69	P01- Dec. 15, 2013 P02- Oct. 12, 2013 P03- Dec. 17, 2013 P04- Oct. 09, 2013 P05- Aug. 26, 2013 P06- Nov. 01, 2013 P07- Dec. 25, 2013	P01- Dec. 20, 2013 P02- Oct. 12, 2013 P03- Dec. 22, 2013 P04- Oct. 09, 2013 P05- Aug. 26, 2013 P06- Nov. 01, 2013 P07- Dec. 30, 2013
13	Time Extension for Project 7	AP	AP	AP	Dec. 27, 2013	Dec. 27, 2013	0	P#7=20	\$13,548,957.31	\$13,548,957.31	\$96,276.69	\$96,276.69	P01- Dec. 20, 2013 P02- Oct. 12, 2013 P03- Dec. 22, 2013 P04- Oct. 09, 2013 P05- Aug. 26, 2013 P06- Nov. 01, 2013 P07- Dec. 30, 2013	P01- Dec. 20, 2013 P02- Oct. 12, 2013 P03- Dec. 22, 2013 P04- Oct. 09, 2013 P05- Aug. 26, 2013 P06- Nov. 01, 2013 P07- Jan. 19, 2014
14	Final Definitive Quantities for project 1 & project 3 and additional safety Enhancement Activities at project 1	AP	AP	AP	Jan. 03, 2014	Jan. 16, 2014	\$16,161.73	---	\$13,548,957.31	\$13,565,119.04	\$96,276.69	\$80,114.96	P01- Dec. 20, 2013 P02- Oct. 12, 2013 P03- Dec. 22, 2013 P04- Oct. 09, 2013 P05- Aug. 26, 2013 P06- Nov. 01, 2013 P07- Jan. 19, 2014	P01- Dec. 20, 2013 P02- Oct. 12, 2013 P03- Dec. 22, 2013 P04- Oct. 09, 2013 P05- Aug. 26, 2013 P06- Nov. 01, 2013 P07- Jan. 19, 2014
15	Interim Time Extension for Project 07	AP	AP	AP	Jan. 15, 2014	Jan. 16, 2014	\$0.00	P#7= 14	\$13,565,119.04	\$13,565,119.04	\$80,114.96	\$80,114.96	P01- Dec. 20, 2013 P02- Oct. 12, 2013 P03- Dec. 22, 2013 P04- Oct. 09, 2013 P05- Aug. 26, 2013 P06- Nov. 01, 2013 P07- Jan. 19, 2014	P01- Dec. 20, 2013 P02- Oct. 12, 2013 P03- Dec. 22, 2013 P04- Oct. 09, 2013 P05- Aug. 26, 2013 P06- Nov. 01, 2013 P07- Feb. 02, 2014
16	Interim Time Extension for Project 07	AP	AP	AP	Jan. 30, 2014	Jan. 31, 2014	\$0.00	P#7= 14	\$13,565,119.04	\$13,565,119.04	\$80,114.96	\$80,114.96	P01- Dec. 20, 2013 P02- Oct. 12, 2013 P03- Dec. 22, 2013 P04- Oct. 09, 2013 P05- Aug. 26, 2013 P06- Nov. 01, 2013 P07- Feb. 02, 2014	P01- Dec. 20, 2013 P02- Oct. 12, 2013 P03- Dec. 22, 2013 P04- Oct. 09, 2013 P05- Aug. 26, 2013 P06- Nov. 01, 2013 P07- Feb. 16, 2014
17	Interim Time Extension for Project 07	AP	AP	AP	Feb. 13, 2014	Feb. 14, 2014	\$0.00	P#7= 14	\$13,565,119.04	\$13,565,119.04	\$80,114.96	\$80,114.96	P01- Dec. 20, 2013 P02- Oct. 12, 2013 P03- Dec. 22, 2013 P04- Oct. 09, 2013 P05- Aug. 26, 2013 P06- Nov. 01, 2013 P07- Feb. 16, 2014	P01- Dec. 20, 2013 P02- Oct. 12, 2013 P03- Dec. 22, 2013 P04- Oct. 09, 2013 P05- Aug. 26, 2013 P06- Nov. 01, 2013 P07- March 02, 2014

VO No.	DESCRIPTION	VO Status (AP/PE/RE/RJ)			Date Sent to B&V	USAD Approval Date	Variation order Amount	Time Ex. Days	Previous BOQ line items	Revised BOQ line item	Previous Day work amount	Revised Day work amount	Previous Completion Date	Revised Completion Date
		APCO	B&V	USAID										
18	Interim Time Extension for Project 07	AP	AP	AP	Feb. 26, 2014	Feb. 27, 2014	\$0.00	P#7= 7	\$13,565,119.04	\$13,565,119.04	\$80,114.96	\$80,114.96	P01- Dec. 20, 2013 P02- Oct. 12, 2013 P03- Dec. 22, 2013 P04- Oct. 09, 2013 P05- Aug. 26, 2013 P06- Nov. 01, 2013 P07- March 02, 2014	P01- Dec. 20, 2013 P02- Oct. 12, 2013 P03- Dec. 22, 2013 P04- Oct. 09, 2013 P05- Aug. 26, 2013 P06- Nov. 01, 2013 P07- March 09, 2014
19	Site Offices and Permanent Signs Cost Savings, New Project Sign and Final Definitive Quantities for Bait Enoon Roundabout.	AP	AP	AP	Mar. 06, 2014	Mar. 07, 2014	\$45,923.82	P#7 = 21 Day	\$13,565,119.04	13,611,042.86	\$80,114.96	\$34,191.14	P01- Dec. 20, 2013 P02- Oct. 12, 2013 P03- Dec. 22, 2013 P04- Oct. 09, 2013 P05- Aug. 26, 2013 P06- Nov. 01, 2013 P07- March 09, 2014	P01- Dec. 20, 2013 P02- Oct. 12, 2013 P03- Dec. 22, 2013 P04- Oct. 09, 2013 P05- Aug. 26, 2013 P06- Nov. 01, 2013 P07- March 30, 2014
20	Final Definitive Quantities and Final List of Roads for Project 07	AP	AP	AP	Mar. 27, 2014	Mar. 31, 2014	\$2,186.44	00	\$13,611,042.86	\$13,613,229.30	\$34,191.14	\$32,004.70	P01- Dec. 20, 2013 P02- Oct. 12, 2013 P03- Dec. 22, 2013 P04- Oct. 09, 2013 P05- Aug. 26, 2013 P06- Nov. 01, 2013 P07- March 30, 2014	P01- Dec. 20, 2013 P02- Oct. 12, 2013 P03- Dec. 22, 2013 P04- Oct. 09, 2013 P05- Aug. 26, 2013 P06- Nov. 01, 2013 P07- March 30, 2014
AP: Approved    PE: Pending    RE: Revise    RJ: Rejected														

**Table 8.2: VARIATION ORDER REQUESTS LOG:**

<b>VOR No.</b>	<b>DESCRIPTION</b>	<b>Date Sent to B&amp;V</b>	<b>Variation order Amount</b>	<b>Time Ex.</b>
01	Mobilization (Site offices)	16 May 2013	(12,513.17)	0
02	Changes and additional new items due to revised design drawings and differing site conditions - Projects 01,02,03,04, and 06	15 June 2013	Closed	25 Days for project #3
03	Repair or retrofitting to the existing solar light poles system -Project 04	15 June 2013	Not required	0
04	Project # 5 Qalandiya-Jabaa Road Safety Enhancement-Project 05	20 June 2013	Included in VO#2	0
05	Change in the requirements, additional new items, revised scope of work, existing site conditions, delay in approved traffic control plan for projects #01 and 02, new water pipe line in project #03	11 July 2013 ( Revision A) 24 July 2013 (Revision B)	Approved through VO #12	10 days (P# 01) 10 days (P# 02) 20 days (P# 03)
06	Change in the requirements, additional new items, revised scope of work, existing site conditions, changing road alignment in project #1 , and new water pipe line for projects 01 and 02	15 July 2013	Closed	40 days (P# 01) 15 days (P# 02) 15 days (P# 03)
07	Change in the requirements, additional new items, revised scope of work, existing site conditions.	01 August 2013	Closed	8 days (P# 03) 6 days (P# 04)
08	Change in the requirements, additional new items, revised scope of work, existing site conditions.	September 01, 2013	Closed	10 days (P# 02) 25 days (P# 03)
09	Change in the requirements, additional new items, revised scope of work, existing site conditions.	September 05, 2013	Included in VO#5	0
10	Change in the requirements, additional new items, revised scope of work, existing site conditions.	September 16, 2013	Closed, VO#12	8 days (P# 01)
12	Change in the requirements, additional new items, revised scope of work, existing site conditions.	September 16, 2013	Closed, VO #12	25 days (P#03)
13	Change in the requirements, additional new items, revised scope of work, existing site conditions.	September 16, 2013	Included in VO#7	0
14	Change in the requirements, additional new items, revised scope of work, existing site conditions.	September 16, 2013	Included in VO#6, 7 and 8	0
15	Change in the requirements, additional new items, revised scope of work, existing site conditions.	September 21, 2013	Included in VO#6 and 7	18 days (P# 01) 14 days (P# 04) 21 days (P# 06)
16	Change in the requirements, additional new items, revised scope of work, existing site conditions.	Sep. 23, 2013 ( Revision A) Oct. 24, 2013 ( Revision B)	Closed	0

<b>VOR No.</b>	<b>DESCRIPTION</b>	<b>Date Sent to B&amp;V</b>	<b>Variation order Amount</b>	<b>Time Ex.</b>
17	Change in the requirements, additional new items, revised scope of work, existing site conditions.	October 24, 2013	Closed	25 days (P# 07)
18	Work Stoppage, Change in requirement of stone boulder surface and partially Reconstruction of stone boulders. Project #7	October 27, 2013	Rejected	0
19	Change in the requirements, additional new items, revised scope of work, existing site conditions. Project#6	October 27, 2013	Included in VO#8	0
20	Change in the requirements, additional new items, revised scope of work and existing site conditions.	Dec 02, 2013	Included under VO#12	0
21	Change in the requirements, additional new items, revised scope of work and existing site conditions.	Dec 09, 2013	Included under VO#12	0
22	Change in the requirements, additional new items, revised scope of work and existing site conditions.	Jan. 27 , 2013	Rejected and resubmitted	14
23	Change in the requirements, additional new items, and revised scope of work, Revised Quantities and existing site conditions.	Feb. 02, 2014	Resubmitted	18
24	Change in the requirements, additional new items, and revised scope of work, Revised Quantities and existing site conditions. Electrical System at Beit Enoon	Mar. 05, 2014	Included under VO#19	21

## Progress Payments

Monthly payments were prepared and submitted to USAID starting May 2013, fourteen monthly payments were requested. The final payment (\$123,287.95) is not submitted yet. The final task order amount is \$13,613,229.30, remaining day work is \$32,004.70.

Appendix F shows a detailed table for monthly submitted payments amounts and dates.

<b>Original contract value</b>	<b>Final contract value</b>	<b>Remaining Day work</b>	<b>Total paid to date</b>	<b>Final payment amount (Pending)</b>	<b>Liquidated damage amount</b>
\$13,645,234.00	\$13,613,229.30	\$32,004.70	\$13,489,941.35	\$123,287.95	(\$23,471.00)

At Project 03- The subcontractor (Al Fakher) submitted a claim to USAID regarding stoppage of work during asphalt works due to landowners; objections and physical attack on field staff and labors. The value approved by USAID on this claim is \$11,014.15. APCO/ArCon and the subcontractor will submit justification letter for requested claim amount to USAID.

<b>Table 8.3: Payments log</b>								
<b>Invoice #</b>	<b>Gross Amount</b>	<b>Retention Amount</b>	<b>Invoiced Amount</b>	<b>Cumulative Amount</b>	<b>Task Order Amount</b>	<b>Remaining Amount</b>	<b>Date Sent to BV</b>	<b>Date Received</b>
<b>AID-294-TO-13-00004 - Task Order No.: 04 Multiple Roads Project in the South Area (MRS)</b>								
1	\$493,151.80	\$0.00	\$493,151.80	\$493,151.80	\$13,645,234.75	\$13,152,082.95	May 30, 2013	17-Jun-13
2	\$321,077.64	\$0.00	\$321,077.64	\$814,229.44	\$13,645,234.00	\$12,831,004.56	July 2, 2013	July 22, 2013
3	\$893,082.84	\$0.00	\$893,082.84	\$1,707,312.28	\$13,645,234.00	\$11,937,921.72	July 10, 2013	July 23, 2013
4	\$1,198,076.48	\$0.00	\$1,198,076.48	\$2,905,388.76	\$13,645,234.00	\$10,739,845.24	August 5, 2013	August 20, 2013
5	\$1,455,358.97	\$0.00	\$1,455,358.97	\$4,360,747.73	\$13,645,234.00	\$9,284,486.27	September 2, 2013	September 18, 2013
6	\$764,042.60	\$0.00	\$764,042.60	\$5,124,790.33	\$13,645,234.00	\$8,520,443.67	September 9, 2013	September 23, 2013
7	\$1,825,853.84	\$0.00	\$1,825,853.84	\$6,950,644.17	\$13,645,234.00	\$6,694,589.83	October 7, 2013	October 24, 2013
8	\$2,243,275.59	\$0.00	\$2,243,275.59	\$9,193,919.76	\$13,645,234.00	\$4,451,314.24	November 3, 2013	December 5, 2013
9	\$934,841.79	\$0.00	\$934,841.79	\$10,128,761.55	\$13,645,234.00	\$3,516,472.45	November 28, 2013	December 18, 2013
10	\$390,133.35	\$0.00	\$390,133.35	\$10,518,894.90	\$13,645,234.00	\$3,126,339.10	December 9, 2013	December 26, 2013
11	\$1,036,879.56	\$0.00	\$1,036,879.56	\$11,555,774.46	\$13,645,234.00	\$2,089,459.54	December 29, 2013	January 19, 2014
12	\$548,414.79	\$0.00	\$548,414.79	\$12,080,718.25	\$13,645,234.00	\$1,564,515.75	December 31, 2013	January 24, 2014
LD	(\$23,471.00)	\$0.00	(\$23,471.00)					
13	\$1,236,565.16	\$0.00	\$1,236,565.16	\$13,317,283.41	\$13,645,234.00	\$327,950.59	March 27, 2014	April 17, 2014
14	\$172,657.95	\$0.00	\$172,657.95	\$13,489,941.36	\$13,645,234.00	\$155,292.64	June 3, 2014	June 27, 2014
15	\$123,287.95	\$0.00	\$123,287.95	\$13,613,229.31	\$13,645,234.00	<b>\$32,004.7</b>	Not submitted Yet	
<b>Total</b>	<b>\$13,613,229.31</b>	<b>\$0.00</b>	<b>\$13,613,229.31</b>					

# 9 || JOB OPPORTUNITIES

## Job opportunities

It is evident this Task Order has improved travel, and contributed to improved living conditions. In addition, the project benefited the residents in the vicinity by providing job opportunities during the construction period.

APCO/ArCon in cooperation with the subcontractors made it a priority to recruit manpower from the adjacent communities to the project whenever suitable and possible. It is estimated that the project created an average of about **1,097** full time equivalent jobs and about **26,119** man-day during the project construction period. Appendix J details the Job opportunities log during the project period.

<b>Task Order (MRS)</b>	Total cumulative employment generated = <b>26,119</b> Man-Days
<b>Project 1</b>	Total cumulative employment generated = <b>4,296</b> Man-Days
<b>Project 2</b>	Total cumulative employment generated = <b>2,524</b> Man-Days
<b>Project 3</b>	Total cumulative employment generated = <b>4,155</b> Man-Days
<b>Project 4</b>	Total cumulative employment generated = <b>1,677</b> Man-Days
<b>Project 5</b>	Total cumulative employment generated = <b>622</b> Man-Days
<b>Project 6</b>	Total cumulative employment generated = <b>4,928</b> Man-Days
<b>Project 7</b>	Total cumulative employment generated = <b>7,915</b> Man-Days

<b>Total Job Days</b>	<b>No. of Full Time Equivalent (FTE) Jobs = (Total Job Days / 23.8)</b>
Total generated = <b>26,119</b> Man-days	Total generated = <b>1,097</b>

Please note the following regarding above mentioned statistics:

1. Local project working forces are reported ONLY.
2. Main office staff and shared or program staff are not included.
3. APCO/ArCon key personnel and management staff working hours were divided between the 7 projects this include the TOM, QCM, SEO, Public Relation officer, Assistant PM, and the office Engineer.
4. Data included in the Back-up sheets (Annex J) are in (Hours) and in the Summary sheet are (Man-days).
5. Data included in the Back-up sheets (Annex J) are rounded to the nearest integer number.

# 10 || SUBMITTALS

## Submittals

The submittal process is the mechanism by which the terms of the contract and the requirements of the contract documents are enforced and the specified quality is assured to be implemented. The following types of submittals were made before, during and after the construction.

- Preconstruction:  
For the site location / layout, site offices furniture list, sign details, quality control program, construction safety program, environmental monitoring and mitigation plan, traffic control system, construction risk management program, subcontractor and product list, method statement, key personnel, and construction schedule.
  - Material:  
For the various materials specified on the project such as concrete mix design, asphalt, prime coat, steel, R.C pipes, road marking and cat eyes, curb stones, road signs.
  - Shop Drawings and As Built :  
For the road plans, profile, cross sections, and details.
  - Schedule :  
For the project monthly updated time schedules and S-curve.
  - Request for Information (RFIs) :  
For any questions or clarifications needed during the course of construction.
- Other submittals were submitted in the Field such as Tests and Inspection requests.

Table 10.1 summarizes the submittals log statistics, for detailed submittals log refer to Appendix B.

Table 10.1: Submittals\*\* Statistics log

Project	Total Submitted	Total Reviewed	Total Under Review	No Exceptions Noted	Make Corrections Noted	Amend-Resubmit	Rejected-Resubmit	Review Not Required
				"A"	"B"	"C"	"D"	"E"
MRS	44	44	0	9	21	8	0	6
WJA	78	78	0	11	50	16	1	0
WJB	41	41	0	4	29	5	1	2
SSC	48	48	0	9	30	3	2	4
WNV	40	40	0	4	28	4	2	2
QAL	22	22	0	5	12	3	1	1
THR	98	98	0	11	68	8	2	9
HEB	102	102	0	11	73	17	0	1
<b>Total</b>	<b>473</b>	<b>473</b>	<b>0</b>	<b>62</b>	<b>311</b>	<b>64</b>	<b>9</b>	<b>25</b>
<b>%</b>		<b>100%</b>	<b>0.0%</b>	<b>13.5%</b>	<b>65.8%</b>	<b>13.5%</b>	<b>1.9%</b>	<b>5.3%</b>

No. of retracted submittals = 12 submittal

\*\*Note: Submittals Statistics log do not include the Tests and Inspection Requests.

Total No. of RFIs submitted for this task order is **24 RFI**.

All submittals were made to CMC/ B&V and were returned within the required review day period. Please refer to appendix B for submittals and RFIs log.

# 11 || COMMUNICATION, COORDINATION

## **Communication**

Communication between different parties [USAID, APCO/ArCon, Black and Veatch and Subcontractors] during the project period was essential and fruitful to monitor the project progress, solve problems, obstructions; emerged issues on site and to finalize the project on the planned time. Appendix A Details the Outgoing / Incoming USAID Correspondences and Outgoing / Incoming Consultant Correspondences.

## **Coordination**

Coordination, meetings and phones between USAID, APCO/ArCon, APCO/ArCon, local subcontractors, Palestinian Authorities, local councils, utility owners, and Israeli authorities were held. Senior management meetings were held between USAID, APCO/ArCon and Black and Veatch on a Bi-weekly basis to discuss progress of the 7 Projects. Appendix A summarize all coordination's that took place regarding Task Order 04 Roads, detailing its dates, different parties involved and the reason for the coordination meeting.

## **Out Reach and Public Relation**

Resident's satisfaction and safety was a priority during the road construction. A public relation officer was assigned to ensure Coordination with the local authorities (municipalities and village councils) and to ensure public awareness about the project and their support and cooperation. Approved Flyers about the project scope and its duration were distributed between residents within projects vicinity. Figures 11.15 and 11.20 show the flyers in Arabic language that were distributed within the 7 roads consisting this task order surroundings.

## **Permanent Sign**

Permanent Signs for this task order road projects were designed according to specifications, sign text and fabrication was submitted and approved by CMC and USAID. The location was approved by USAID as follow:

- Project 01- WJA at St. 2+720 LHS.
- Project 02- WJB at St. 0+000 LHS
- Project 03- SSC at St. 1+295 LHS
- Project 04- WNV at St. 0+540 RHS
- Project 05- QAL at St. 0+750 LHS
- Project 06- THR at St. 0+000 RHS- Segment A
- Project 07- HEB at Al Sha'aba Roundabout  
Beit Enoon Intersection

Figures 11.1 and 11.14 shows permanent sign approved text and signs pictures during installation.



Figure 11.1: Approved permanent sign text for Projects 01 and 02

Figure 11.2: Projects 01 & 02 permanent sign after installation.



Figure 11.3: Approved permanent sign text for Project 03.

Figure 11.4: Permanent sign after installation- Project 03.



Figure 11.5: Approved permanent sign text for Project 04.

Figure 11.6: Permanent sign after installation- Project 04.



Figure 11.7: Approved permanent sign text for Project 05.

Figure 11.8: Permanent sign during installation- Project 05.



Figure 11.9: Approved permanent sign text for Project 06.



Figure 11.10: Permanent sign after installation- Project 06.



Figure 11.11: Approved permanent sign text for Project 07.



Figure 11.12: Permanent sign after installation- Project 07.



Figure 11.13: Approved permanent sign text for Project 07- Beit Enoon Roundabout.



Figure 11.14: Permanent sign after installation- Project 07- Beit Enoon Roundabout.



Figure 11.15: Approved and distributed Flyers Text – Projects 01 and 02.



Figure 11.16: Approved and distributed Flyers Text – Project 03.



Figure 11.17: Approved and distributed Flyers Text – Project 04.



Figure 11.18: Approved and distributed Flyers Text – Project 05.



Figure 11.19: Approved and distributed Flyers Text – Project 06.



Figure 11.20: Approved and distributed Flyers Text – Project 07.

# 12 || GOALS AND LESSONS

## **Lessons Learned**

Although lessons were learned during the first INP program on previous task orders, lessons still have to be validated on new projects. We, however, found that sound practices and proactive management are the pre-requisites for successful project implementation and delivery.

We believe it is worth to note the following:

The local work force is becoming more safety conscious and in general more cooperative than INPI. Safety education and training is the key, we intend to intensify our efforts.

### **Pricing**

From the “Get Go” APCO/ArCon estimated the quantity and cost of work in house and solicited subcontractors pricing according to the BOQ issued by the CMC. APCO/ArCon’s technical staff developed revisions to the BOQ to assure the scope of work will be fully covered by the subcontractors to minimize and / or avoid cost overruns.

This process proved to be extremely effective evidenced by the fact that additional cost to the client and APCO/ArCon was held to a minimum. In fact, the amounts included in the proposal as a contingency were spent on expansion of the work scope furthering the goal of USAID to maximize the value of the dollar spent.

### **Subcontractor Selection**

On this task order APCO/ArCon selected four capable subcontractors and self-performed one of the projects. APCO/ArCon’s management team assisted the Subcontractors to maximize their resources by proper scheduling, established a clear and defined scope of work, and assumed the administration of the contractual responsibilities allowing subcontractors to focus solely on field operations. This approach relieved the construction subcontractors from having to invest valuable time producing surveys, shop drawings, and other technical submittals. At the same time APCO/ArCon was mindful that part of its function is to provide capacity building opportunities to local subcontractors, accordingly, documentation was developed in close cooperation with subcontractors by APCO/ArCon through investing time and accommodating subcontractors schedules to include night meetings and study sessions.

APCO/ArCon’s management, in house technical abilities combined with the subcontractor’s concentration on the field operations led to successful conclusion of the project.

### **Team Work**

The daily communication with the CMC and the subcontractors to coordinate and resolve project related issues proved to be the essential task which determined the quality and delivery of the project on time.

The CMC’s availability to answer questions, speedy review of submittals, daily communications and Bi-weekly progress meetings greatly facilitated the implementation of the work. The Subcontractors adherence to project guidelines as defined by the documents and following the contractual conditions set by APCO/ArCon kept the project progressing in accordance with schedule.

This team approach was extremely effective to overcome and recover time lost due to rainy days, underground utilities, landowner’s objections, local council changes / additional requests and other conditions. The schedule was recovered by utilizing fast track method towards the end of the projects by continuing team work approach. The Subcontractors, APCO/ArCon, CMC, and USAID, each worked diligently on matters within their domain of authority

eventually leading the projects to successfully conclude on time, within ceiling price and high quality. However, the contractor objected to USAID on the 2 projects that was delayed and handed after project contractual end date and contends the delay was excusable.

### **Geo-Political Conditions**

APCO/ArCon was concerned that the political situation in the West Bank may have a negative effect on the project from time to time such as effective access to resources, materials, manpower, and access to the project site. However, timely communication and coordination with the authorities having jurisdiction facilitated the implementation of the work keeping disruptions to a minimum. The Palestinian Authority, Local Councils, Israeli Authorities were cooperative if given advance notice and properly informed.

## **Goals Achieved**

APCO/ArCon's goals were to deliver the contractual commitment and meet or exceed the conditions set by USAID and the CMC. We believe this project met all the goals anticipated as follows:

### **Time**

All project activities were scheduled at commencement using Primavera scheduling software. Recovery plans were implemented when field conditions changed. The delays caused by severe weather (snow), utility works, landowner's objections, lack of resources, late delivery of equipment, late start up of certain activities, local council change and additional work requests were knowledgeably mitigated leading to the successful conclusion of the project.

### **Quality**

The project documents (drawings/specifications) prepared by the CMC along with the QA/QC program instituted by APCO/ArCon defined the desired qualities. The combined field staff of both organizations were instrumental in assuring the specified quality is achieved. Third party testing and controls validated the outcome as required by the contract.

### **Safety**

Avoiding and possibly eliminating construction related accidents is APCO/ArCon's continuous goal, "Safety is First". This project was delivered accidents free. 2 minor typical construction incidents relating to equipment (as explained in the Safety section) and 2 non-construction incidents involved local residents physically assaulting our project staff because residents were unhappy their personal demands were not met.

The safety program instituted by APCO/ArCon proved to be an effective instrument when enforced maximizing job safety. APCO/ArCon will continue its efforts to educate the local force on the importance of job safety. It is important to note that we notice a continuous attitude change towards safety with the subcontractors that worked under the (INP-I) Program previously and with the general community.

### **Cost**

The entire scope of work was implemented in accordance with the documents. The day work included in the budget as a contingency was spent at the direction of USAID to expand the scope of the project and provide additional road rehabilitation (additional milling, retaining walls, storm drainage systems, Beit Enoon Roundabout construction, safety enhancement) and installing new water and sewer lines. This was accomplished with collaborative efforts of all entities involved working together in a proactive approach to minimize cost over runs.