GOVERNMENT OF INDIA AND GOVERNMENT OF PUNJAB

PUNJAB ROADS & BRIDGES DEVELOPMENT BOARD

INCEPTION CUM MONTHLY PROGRESS REPORT (NOVEMBER 2014)

Monitoring of Output and Performance Based Road Contract (OPRC) for Sangrur Mansa Bathinda Network in Punjab (India)
Contract Agreement No. 1 of 2014-15

THE WORLD BANK

TNM TECHNOLOGY AND MANAGEMENT LTD.

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Monitoring Consultant – Project Office
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ABREVIATIONS

A – Association.
AASHTO - American Association of State Highway and Transportation Officials
AADT - Annual Average Daily Traffic (AADT).
AC - Asphalt Concrete (AC):
ASTM - American Society for Testing and Materials.
BANK - World Bank
Base Year – Last Completed Financial Year at the time of receipt of the Bids
BC – Bituminous Concrete
BDPO-Block Development and Panchayat Officer
BDS - Bid Data Sheet
BM-Bituminous Macadam
BoQ – Bill of Quantities
C - Consortium
CBR - California Bearing Ratio
CoI – Corridor of Impact
CQAMP – Contract Quality Assurance Management Plan
DBM- Dense Bituminous Macadam
DCP- Dynamic Cone Penetrometer
dgMarket – International portal for tenders and procurement opportunities from governments and international organisations (www.dgmarket.com)
DRB - Dispute Review Board
EHS – Environment Health and Safety
EIA – Environmental Impact Assessment
EMP - Environmental Management Plan
EIRR - Economic Internal Rate of Return
ESA- Equivalent Standard Axel
ESMF-Environmental Social Management Framework
FIDIC - Fédération Internationale Des Ingénieurs-Conseils - International Federation of Consulting Engineers
FWD - Falling Weight Deflectometer
FWP – Forward Work Programme
GC or GCC- General Conditions of Contract
GDP - Gross Domestic Product
GoI - Government of India
GoP - Government of Punjab
IBRD – International Bank for Rehabilitation and Development
ICB – International Competitive Bidding
IDA – International Development Association
INR – Indian Rupees
IRC- Indian Roads Congress
IRI - International Roughness Index
IRR- Internal Rate of Return
ITB - Instructions to Bidders
JV - Joint Venture
JVA - Joint Venture Agreement.
km - Kilometer/Kilometre
LoS - Level of Service.
MDR – Major District Road

MoEF – Ministry of Environment and Forests
Section I – Instruction to Bidders 9
Government of Punjab (Public Works Department Buildings and Roads)
MORT&H – Ministry of Road Transport and Highways
MPa - Mega Pascal. Unit of Measurement
MPD – Mean Profile Depth
MPM- Management Performance Measures
MSA – Million (Equivalent) Standard Axels
NABARD – National Bank for Agriculture and Rural Development
NH – National Highway
NHAI – National Highways Authority of India
NPV - Net Present Value
ODR – Other District Road
OPRC - Output and Performance based Road Contracts.
PAP – Project Affected Person
PC – Particular Conditions of Contract
PCU – Passenger Car Unit
PIRR- Project Internal Rate of Return (PIRR)
PMGSY – Pradhan Mantri Gram Sadak Yojana
PSPCB – Punjab State Pollution Control Board
PWD – Public Works Department
PRBDB – Punjab Roads and Bridges Development Board
PSRSP – Punjab State Road Sector Project
QA – Quality Assurance
QC - Quality Control
RAP - Resettlement Action Plan
RDPM – Road Durability Performance Measure
ROMDAS – Road Measurement Data Acquisition System
RoW – Right of Way
RPM – Raised Pavement Marker
RUS&CPM – Road User Service and Comfort Performance Measure
SDBC – Semi Dense Bituminous Concrete
SH – State Highway
SIA – Social Impact Assessment
TMP – Traffic Management Plan
ToR – Terms of Reference
UNDB online - United Nations Development Business online (www.devbusiness.com)
WB – World Bank

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Chapter 1 Our Understanding of the Project

1.1 Project summary

The Government of India received financing from the International Bank for Reconstruction and Development (IBRD) towards the cost of Punjab State Road Sector Project, and applied through Punjab Roads & Bridges Development Board (PRBDB) a portion of the funds for the Monitoring/Supervision of its state road network pertaining to the Sangrur-Mansa-Bathinda sections.

The Government of Punjab (GoP) through **Punjab Public Works Department, Building & Roads, PWD (B&R)** has allotted **PATEL INFRAESTRUCURE PVT. LTD t**he work for Improvement, Rehabilitation and Routine Maintenance of approximately 204 Km of its state road network comprising the Sangrur-Mansa-Bathinda network, who begin the contract on 05-Dec-2012 with expected date of completion being 04-Dec-2022.

The contract allotted, is an **Output and Performance based Road Contract (OPRC)** whereby the Contractor is responsible for the overall management of the network, including all of the routine maintenance works, design and construction of the required surfacing renewal, pavement rehabilitation and improvement works and the management of any necessary emergency works.

Output and Performance based contract for Roads are designed to increase the efficiency and effectiveness of road asset management and maintenance. It should ensure that the physical condition of the roads is adequate for the road users over the entire period of the contract. This type of contract is significantly different from the simple execution of works to the management and conservation of road assets.

The OPRC is a model, wherein contractor is paid for fixed lump-sum prices for bringing the road to a certain specified service level i.e., the Rehabilitation, Improvement and Resurfacing of the road to pre-defined standards, and then maintaining it at that level for a relatively long period for a lump-sum periodic remuneration to cover all physical and non-physical services provided by the Contractor, except for unforeseen emergency works which are remunerated separately. The service Levels stated in the contract are defined from a road user‘s perspective and from a strength of the pavement point of view and include factors such as, riding comfort, safety features, residual strength of pavement, etc.

The OPRC Contractor is responsible for the routine maintenance works, surfacing renewal works, pavement rehabilitation works, improvement works and emergency works on the roads within the network area for a period of up to 10 years. The Contractor is required to deliver specified outputs under this contract and these outputs will be measured against defined performance criteria.

The Client proposed to engage an appropriately qualified and experienced Monitoring Consultant to assist the Employer on all aspects of management, monitoring and auditing of the OPRC Contractor’s performance along with rendering assistance with the long term asset management of the road networks within the OPRC contracts.**Technology and Management Limited, Israel in association with ICRA Management Consulting Services Ltd, India** was selected as the preferred bidder to undertake the role of the Monitoring Consultant (MC) on behalf of Punjab Roads and Bridges

Development Board, a statutory body established under the Punjab Roads and Bridges Development Board Act, 1998 (Punjab Act No. 22 of 1998)

1.2 Role of the Monitoring Consultant

The appointed Monitoring Consultant shall be responsible for assisting the Employer's Representative in implementing and maintaining an appropriate regime for managing the OPRC contract.

The Consultant will represent the Client as the Project Manager under the General Conditions for an Output and Performance-based Road Contract. Accordingly, the objective of the Consultant's role is to provide timely and orderly required advice to minimize any potential risk to the Employer by verifying the achievement of all of contractual requirements under the works contract within the stipulated time and budget.

As a representative of the Employer, the Monitoring Consultant (MC) will be responsible for the administration of the above described Contract and for the verification of works and services to be performed by the Contracting Entity (CE) for the Civil Works. The above includes the continuous assessment of the CE´s technical performance. The MC will be in charge of:

Part A: Fulfilling the role of Project Manager

Part B: Conformance Monitoring and Management

Part C: Network Condition Monitoring and Pavement Condition Modelling

Part D: Network Information and Data Analysis

Specifically this advice would include, but would not be limited to:

- Review of the OPRC Contractor's annual and rolling three year programme.
- Development and review of the Client's 10 year Forward Work Programme
- Review of the applied levels of service and associated performance measures, where necessary the development and implementation of modified levels of service and associated performance measures,
- Review of measures for monitoring and managing pavement asset consumption.

The Consultant will represent the Client as the Project Manager under the General Conditions for an Output and Performance-based Road Contract. Accordingly, the objective of the Consultant's role is to provide timely and orderly required advice to minimize any potential risk to the Employer by verifying the achievement of all of contractual requirements under the works contract within the stipulated time and budget.

The Consultant has carefully studied the Request for Proposals, and it is fully aware of the scope of the services. The Consultant will fulfill his duties and responsibilities as Project Manager under the General Conditions for an OPRC.

The Consultant (MC) will monitor the works and approve the materials and the workmanship of the works. This will be done in co-operation and consultation with the Employer. The MC will have no authority to relieve the Contractor of any of his duties or obligations under the Contract. Neither work entailing delays, nor any extra payment will be approved by the MC without the authority of the Employer.

The Monitoring Consultant will be responsible, inter alia for:

- Monitoring the performance of the Contractor based on the approved Work Programme;
- Overall monitoring of the road construction being done by the Contractor, based on achieving and maintaining the required and designed levels of service;
- Evaluation of the quality and residual life of road pavement, both presented, designed, constructed and maintained by the Contractor;
- Evaluation and recommendation of designs proposed by the Contractor for acceptance to Employer;
- Evaluation and monitoring of the performance of Environmental Impact Management Plan and Resettlement & Rehabilitation Plan by the Contractor;
- Managing the Quality Assurance of the roads and bridges and Monitoring the quality control of the Contractor;
- Monitoring, overall supervision and recommendation for acceptance of data for inventory updating submitted by the Contractor;
- The review of all technical documentation required for payment and recommendations for approvals of the monthly billing presented by the Contractor;
- Review and monitor the process leading to the creation and updating of the asset data base using technology acceptable to the Client.

The Monitoring Consultant on a periodic basis will be required to –-

(a) Manage the monthly cycle of audit to verify the level of conformance being achieved by the OPRC Contract(s). These audits will be used to determine the extent of monthly Performance Achievement payments to be made by the Employer & to provide regular robust report to be Employer or his representative on the contractor's overall performance, the outputs being achieved and the impact these are having on the operation and condition of road network.

Table 1-1 : Monthly Audit

Items	Requirement
Randomly selected audit lengths provided to the Contractor.	27th calendar day of the month or the first working day thereafter.
Contractor monthly report to be received by Team Leader (T.L.).	3rd calendar day of the month following or the first working day thereafter.
Team leader and/ Employer to complete review of contractor monthly performance audit results and any adjustment top the monthly aggregated performance score.	10th calendar day of the month following of the first working day thereafter.
Review and certification of the contractor test results. Review of the contractors request for substantial completion and amended periodic payment report (including any RDPM survey result) provided to the Client/ Representative.	56 days of following the receipt of Contractor Monthly Report or the first working day thereafter.

(b) Establish randomly selected audit sampling system to identify the required minimum sample size (percentage grading) of the road network each month that the Contractor's Conformance Management Units (CMU) must then audit to confirm conformance with the OPRC specifications. The Monitoring Consultant will be required (on the instruction by the

Clients/Representative) to accompany the CMU at regular intervals to verify that they are operating in compliance with the Contractor's own Contract Quality Assurance Management plan (CQAMP). The Monitoring consultant shall record the outcomes of these joint inspections and provide a detail summary of the observation and recommendation as a part of this monthly report. In the event that these inspections identify non-conformance trends that are specific concern, the Monitoring Consultant Shall make a recommendation on the need to increase the size of the audit sample and any others actions that may be necessary to bring the level of conformance back to an acceptable level.

(c) Undertake an independent (of the CMU) audit of the same network sample to verify conformance overall performance, achievement and quality of the contractor activities and to asses overall network conditions. The Client/Representative may accompany the Monitoring Consultant on these inspections.

(d)Develop a comprehensive conformance appraisal and monitoring summary that clearly identifies the outcomes of the both the CMU and the Monitoring consultant own independent audit inspections against the requirements of the OPRC specifications. This Monitoring report shall also incorporate a summary of current network conditions indicators where appropriate. This summary shall form a part of the Monitoring Consultant Recommendation in the payments admissible to the Contractor.

(e) Provide the monthly progress report a summary of work completed each month of each of the different work components along with Network Performance, Inventory data base report, Road Asset Damage Report, QC Test and Damage Report, Vehicle Accident Report, Pavement Repair work report etc. and nature of any defects or constructions issues recommendation on any corrective actions.

1.3 Project Brief

According to the Contractor's Bidding Document, the major components of the Work Contract are given in:

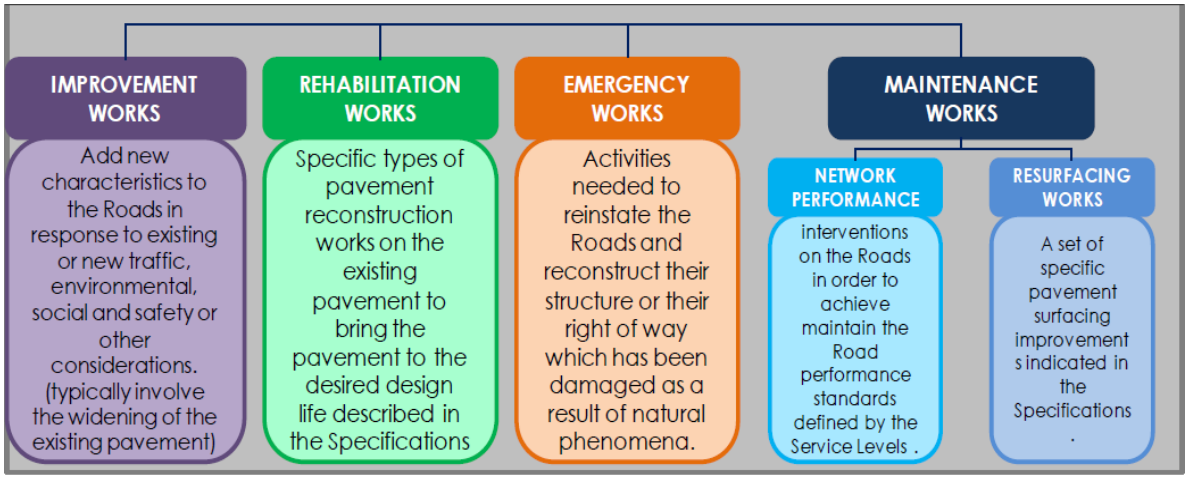


Figure 1-1 : Major components civil Works OPRC Contract for Packages 1 and 2

The roads under the OPRC Contract and their main intervention are given in Table 1-2.

Table 1-2 : Roads under OPRC Contract

Road section	Road Section Name	Classification	Length (km)	Type of intervention
S1	Sangrur - Sunam (MDR 21)	MDR	11.3	Rehabilitation and Resurfacing
S2	Bhawanigarh - Sunam - Bhikhi - SH13 Intersection -	SH	106.13	Improvement Works (widening) and Resurf.
S3	Barnala - Mansa: (SH13)	SH	7.29	Rehabilitation and Resurfacing
S4	Mansa - Talwandi Sabo (up to intersection with B8):	ODR	24.97	Improvement Works (widening) and Resurf.
S5	Dhanaula - Bhikhi: (MDR 14)	MDR	25.34	Rehabilitation and Resurfacing
B8	Bathinda - Kotshamir - Talwandi Sabo (up to	SH	28.65	Rehabilitation and Resurfacing
			203.68	

The principles amidst which this project using OPRC methodology has been designed are those of payments of completed and finished parts of the works (depending on the component under evaluation) if and when they meet the required levels of service, described by qualitative and quantitative parameters during the life-span of the project, i.e the 10 years period. These civil works are based on fixed payments against demonstrated performance for the implementation of works. The following table details out the work schedule to be undertaken by the Contractor over the 10 year period:

Table 1-3 : Work Schedule to be undertaken by the Contractor as per Bid over the 10 year period

Contract Year	Improvement Works (km)	Rehabilitation Works (km)	Resurfacing Works (km)
1	27.	0	34.
2	47.	7.2	0
3	54.	0	0
4	0	25.	11.
5	0	5.0	23.
6	0	2.2	10.
7	0	34.	0
8	0	0	5
9	0	0	68.
1	0	0	0
Contract Total	**128.9**	**74.78**	**203.6**

The initial term of the Monitoring Consultancy services will be for a period of five (5) years. As Contractor's proposal and acceptance by client.

1.4 Completed work & key project milestones achieved on ground based upon the latest MPR and cumulative progress till date

The Government of Punjab (GoP) through **Punjab Public Works Department, Building & Roads, PWD (B&R)** has allotted **PATEL INFRAESTRUCURE PVT. LTD.** The work for Improvement, Rehabilitation and Routine Maintenance of approximately 204 Km of its state road network

comprising the Sangrur-Mansa-Bathinda network, who begin the contract on 05-Dec-2012 with expected date of completion being 04-Dec-2022. The Project details are provided in Table 1-4.

Table 1-4 : Project Details

Project Name	Output and Performance Based Road Contract for Improvement, Rehabilitation, Resurfacing & Routine Maintenance Works of Sangrur - Mansa -Bathinda Area
Funded By	World Bank
Client	Public Works Department (B&R) Punjab
Contractor	Patel Infrastructure Pvt. Ltd.
Name of Associated Consultant	Feedback Infrastructure Pvt. Ltd.
Total Contract Road Length	203.68 KM
Total Project Cost	INR 596.36 Crs
Date of Signing of Contract	10th Dec. 2012
Expected Date of Completion	04th Dec. 2022
Duration of Contract	10 Years

1.4.1 Program Work of the Contractor

Improvement and Rehabilitation Works – Year 1

According to the documents provided by the contractor, it is concluded that in the first year of operation, the contractor fulfilled as per the program chart established and approved by the client. It complied with the improvement of sector S2 w.r.t the following segments (1) from Km 2.240 to 18.300 km and (2) from Km 67.840 to Km 79.000, for a total of 27.2 km improvement works in the first year. With regard to the rehabilitation work as per the approved work program, the contractor fulfilled the rehabilitation pertaining to sector S5 (length of 25,340 km).The Table 1-5discusses the First Year Program conformance.

Table 1-5 : First Year Program Conformance

Sr. No.	Description of Work	ProposedWorkDetails	Year 1
1	**Improvement**	As per Contract	(1) S2 From Km 2.240 to Km 18.300 :- 16.06 KM
			2) S2 From Km 67.840 to Km 79.000 :- 11.16 KM
			TOTAL 27.20 KM
		As per Approved Work Programme	(1) S2 From Km 2.240 to Km 18.300 :- 16.06 KM. Except 8.400 to 9.400 (where alignment is required)
			(2) S2 From Km 67.840 to Km 79.000 :- 11.16 KM.
			TOTAL 26,20 KM
		Achieved	(1) S2 From Km 2.240 to Km 18.300 Except 8.400 to 9.400 (where alignment is required)

			(2) S2 From Km 68.000 to Km 79.000 :- All work is completed **Total 26.06 Km**
2	**Rehabilitation**	As per Contract	**0.00 KM**
		As per Approved Work Programme	Dhanuala - Bhikhi Section of S5 **25.340 KM**
		Achieved	Dhanuala - Bhikhi Section of S5 :- Work Completed **TOTAL 25.340 KM – S5**
3	**Resurfacing**	As per Contract	**34.2 KM**
		As per Approved Work Programme	**0.00 KM**
		Achieved	-

Improvement Works – Year 2

According to the program of works approved by the client, in the second year, improvement works amounting to 60.81km was to be completed by the Contractor. **The contractor has only addressed 24.42 km, corresponding to S4 and has not initiated activities on Sector 2 between km 32 + 000 and Km 67 + 840 having a length of 35.84 km,**

Table 1-6 : Improvement Works for Year 2

Sr. No.	Description of Work	ProposedWorkDetails	Year 2
1	Improvement	As per Contract	(1) S2 From Km 45.22 to Km 67.840 :- 22.630 KM
			(2) S4 From Km 0.000 to Km 24.970 :- 24.970 KM
			TOTAL 47.60 KM
		As per Approved Work Programme	(1) S2 From Km 32.0 to Km 67.840 :- 35.84 KM-Improvement work has done.
			(2) S4 From Km 0.000 to Km 24.970 :- 24.970 KM
			TOTAL 60.81 KM
		Achieved	**Total 24.42 Km** S4 completed 550 M Pending due to Irrigation Canal closure) Approval from Irrigation department.
2	Rehabilitation	As per Contract	S2: **7.29 KM**
		As per Approved Work Programme	S1 From Km 0.00 to Km 11.300 **:- 11.300** KM
		Achieved	S1 From Km 0.00 to Km 11.300 : DBM-**3 KM** – pending BC due to design dispute, which is with DRB
3	Resurfacing	As per Contract	**0.00 KM**
		As per Approved Work Programme	B8 From Km 9.200 to Km 37.850 KM :- **28.65 KM** (Bhatinda to Talwandi Sabo)

		Achieved	B8 From Km 9.200 to Km 37.850 KM :- 28.65 KM (Bhatinda to Talwandi Sabo)

Resurfacing Work – Year 2

Finally, with regards to the resurfacing work and in accordance with the program approved by the client, the contractor must finish resurfacing of the B8 Sector before of finish the second year.

Further, we discuss the itinerary details pertaining to the design Status and Technical Details of the second year program as provided to us by the Contractor.

Table 1-7 : 2nd Year Work Design Status

Sr. No.	Section	Type of Work	KM		Length (Km)	Geometric Design	Pavement Design	
			From	To		Submitted on	Submitted on	Approved On
1	S2	Improvement	32.00	67.84	35.84	11.10.2013	18.11.2013/ 23-01-2014	
2	S4	Improvement	0.00	24.97	24.97	11.10.2013	12-12-2013/ 23-01-2014	06-03-2014
3	S1	Rehabilitation	0.00	11.30	11.30	29.10.2013	29-01-2014	
4	B8	Rehabilitation	9.200	15.000	5.80	06.06.2014	06.06.2014	

Table 1-8: 2nd Year Work Technical Details

Sr No	Section	Type of Work	KM		Length (Km)	Treatment of Existing Road	Treatment for Widening Portion	Nos. of Pipe Culvert Reconstructed / Widened	Nos. of Slab Culvert Reconstructed / Widened
			From	To					
1	S2	Improvement	32.000	46.000	14.000	Milling, DBM 65mm, BC 50mm	Excavation, GSB 200mm, WMM 250mm, DBM 100mm, BC 50mm		
2	S2	Improvement	51.000	67.840	16.840	Milling, DBM 50mm, BC 50mm	Excavation, GSB 200mm, WMM 250mm, DBM 100mm, BC 50mm		

3	S4	Improvement	0.000	6.200	6.200	Milling 25-30mm, DBM -100 mm, BC-50 mm,	Excavation, GSB 200mm, WMM 250mm, DBM 75 mm, BC 50mm		
4	S4	Improvement	6.200	13.400	7.200	Milling 25-30mm,, BC-50 mm,	Excavation, GSB 200mm, WMM 250mm, DBM 75 mm, BC 50mm		
5	S4	Improvement	13.400	24.870	11.470	Milling 25-30mm, DBM -70 mm, BC-50 mm,	Excavation, GSB 200mm, WMM 250mm, DBM 75 mm, BC 50mm		
6	S1	Rehabilitation	0.000	7.000	7.000	Milling 25-30mm, DBM -80 BC-50 mm,	-	-	-
7	S1	Rehabilitation	7.000	11.300	4.300	Milling 25-30mm, DBM -65 BC-50 mm,			

1.5 Summary of Project Manager &Contractor Reports as on date w.r.t conformance and reported deviations

1.5.1 Network Performance Inspection

The following non conformances were reported for across the two year period:-

Table 1-9 : Accumulated Summary of Non – Conformance in each sector

Month	S1	S2	S3	S4	S5	B8	Non – Conformance
March – 2013	2	12	0	10	6	4	34
July – 2013	2	12	0	6	1	4	25
Aug – 2013	2	11	1	2	3	5	24
Sep – 2013	1	14	0	10	2	6	33
Oct – 2013	2	16	0	4	0	5	27
Nov - 2013	1	12	0	5	1	5	24
Dec - 2013	2	13	0	4	2	5	26
Total – 2013	12	90	1	41	15	34	193
Jan – 2014	0	9	3	3	3	6	24
Feb – 2014	1	9	0	2	2	6	20
March – 2014	1	17	0	2	2	4	26
April – 2014	1	11	0	1	3	4	20
May – 2014	1	10	0	3	2	5	21
June – 2014	1	7	0	0	0	1	9
July – 2014	0	5	0	0	0	0	5
Aug – 2014	0	3	0	0	0	3	6
Sep – 2014	1	9	0	6	4	3	23
Oct - 2014	1	13	1	1	3	2	21
Total – 2014	7	93	4	18	19	34	175
Total	19	183	5	59	34	68	368

Table 1-10 : Accumulated Summary of Non – Conformance by Type

Nomenclature	Road User Service & Comfort Performance Measures	Non – Conformance Quantities	Accumulated	Percentage	Accumulated Percentage
RUS&CPM 3	Drainage Maintenance	73	73	19.84	19.84
RUS & CPM 1	Pavement Maintenance	69	142	18.75	38.59
RUS & CPM 5	Obstructions on the Pavement Surface and Shoulders	63	205	17.12	55.71
Any RUS & CPM	Repeat Non - Conformance	57	262	15.49	71.20
RUS & CPM2	Incident Response & Emergency Works Response	46	308	12.50	83.70
RUS & CPM 14	Marker Post Maintenance	20	328	5.43	89.13
RUS & CPM 9	Raised Pavement Markers	16	344	4.35	93.48
RUS & CPM 7	Vegetation Control	11	355	2.99	96.47
RUS & CPM 4	Routine Maintenance of Bridges and other structures	6	361	1.63	98.10
RUS & CPM 10	Pavement Marking	5	366	1.36	99.46
RUS & CPM 8	Road Signs Maintenance	2	368	0.54	100.00
RUS & CPM 6	Incident Response and Emergency Works Response	0	368	0.00	100.00
RUS & CPM 11	Traffic Island and Roundabout	0	368	0.00	100.00

	Maintenance				
RUS & CPM 12	Sight Rail, Hand Rail and Pedestrian Barrier Maintenance	0	368	0.00	1000.00
RUS & CPM 13		0	368	0.00	100.00
Total		368			

Maintenance Drainage (20%), Pavement Maintenance (19%), Obstructions on the Pavement Surface and Shoulders (17%) and Unsealed Shoulder Maintenance (13%) contributed to most of the non-conformances.

SUMMARY MATERIAL USAGE

The following table summarizes the material usage, from July of 2013 until the month of October 2014. It may be noted that the values obtained from MPRs do not add up to the accumulated value as reported by the contractor.

Table 1-11 : Summary Material Usage

S.No	Month	G.S.B (MT)	Aggregate 40mm (MT)	Aggregate 20mm (MT)	Aggregate 10mm (MT)	Dust (MT)	Sand (MT)	Steel (MT)	Cement (MT)	Bitumen (MT)	Emulsion (MT)
1	Jul – 13	7,580.00	1,593.00	4,740.00	5,410.00	6,635.00	250.00	3.00	50.00	166.00	44.00
2	Aug-13	7,107.00	1,250.00	9,095.00	7,095.00	5,870.00	0.00	0.00	15.00	34.75	180.00
3	Sep – 13	21,812.00	6,913.00	10,687.00	0.00	7,784.00	0.00	0.00	20.00	326.20	45.00
4	Oct – 13	18,110.08	12,869.00	17,809.06	10,635.06	14,515.87	0.00	0.00	40.00	757.09	86.25
5	Nov – 13	14,814.37	332.33	14,910.08	18,223.19	13,051.28	0.00	0.00	0.00	1079.30	69.00
6	Dec – 13	27,856.64	14,726.30	27,784.78	23,233.55	29,414.72	0.00	0.00	0.00	1078.49	52.33
7	Jan – 14	10,108.00	2,020.54	3,266.61	2,413.51	12,523.12	115.30	0.00	0.00	0.00	0.00
8	Feb – 14	13,025.43	1,335.97	4,601.11	3,501.98	13,677.02	200.63	10.31	35.00	142.02	0.00
9	Mar – 14	13,025.43	1,335.97	4,601.11	3,501.98	13,677.02	200.63	0.29	1.50	767.66	72.72
10	Apr – 14	10,482.68	8,326.28	3,287.72	8,068.38	15,332.10	228.84	3.02	0.00	2,161.73	87.68
11	May – 14	12,249.37	11,321.73	5,834.91	15,747.24	15,725.74	50.26	0.00	50.00	847.75	127.54
12	Jun – 14	20,663.73	4,442.18	8,820.02	10,759.75	14,487.64	63.38	0.00	50.00	1,359.37	88.44
13	Jul –	20,128.96	3,836.99	5,408.10	4,896.80	9,201.65	168.14	0.00	50.00	812.08	57.85
14	Aug – 14	939.42	1,706.08	3,484.41	1,655.92	5,127.53	0.00	0.00	55.00	458.04	58.35
15	Sep – 14	0.00	1,435.80	2,222.19	2,231.89	4,116.22	0.00	0.00	0.00	120.29	14.96
16	Oct-14	0.00	0.00	2,077.18	1,552.78	3,953.33	0.00	0.00	20.00	125.33	14.99
Total		197,903.09	73,445.38	128,629.28	118,927.00	185,092.24	1,277.18	16.62	386.50	10,236.07	999.11

1.5.2 Non Conformance Report Summary as Presented by the Contractor

The following table summarizes the details pertaining to Network Performance Non- Conformance as reported by the Contractor as per MPR October 2014. The -non-conformances are reported and scored for under three heads:-

1. Total Management Performance Non-Conformance Score (MPM`S)
2. Total Road Durability Non-Conformance Score (RDPM`S)
3. Total Road User Safety & Comfort Non-Conformance Score (RUS&CPM'S)

The Contractor has awarded itself Non – Conformance score of 118 as per the details herewith:-

S. N.	Item Description	Scores
1.	Total Management Performance Non-Conformance Score (MPM`S)	50
2.	Total Road Durability Non-Conformance Score (RDPM`S)	0
3.	Total Road User Safety & Comfort Non-Conformance Score (RUS&CPM'S)	68
Total Score of Non-Conformance	118	

Table 1-12 : Management Performance Measures (MPM's) – As reported by the Contractor

Date : 01-11-14 Period of Payment: 01/10/2014 to 30/10/2014

Reference to Bidding Documents	Item Description	Performance Measure Compliance	No. of Non-Conformances Recorded A	Non-Conformance Weighting	Sub-Weighting Days/Weeks/Months of Recorded Non Conformance	Total Non-Conformance Score AxBxC
MPM 1	Quality Assurance System	Non Conformance due to not organizing HSE camp for 3rd quarter (July- 14 to September-14) of 2nd year. Submission of Environmental Management Plan (EMP) Environmental Screening Report (ESR) Environmental Impact Assessment (EIA) submitted on 02.08.13 (Last date of submission of CQAMP 04.01.2014) (CQAMP submitted on 30.12.13).	1	2	Each week of delay (4)	8
MPM1	Quality Assurance System	Non-Conformance for not submitting Revised Project related EIA as per client `s instructions in June 2014. Submission of Revised Project related EIA Vide letter no. PIPL/OPRC/431/2014 dated 07.10.2014. Submission of	1	2	Each day of delay (13)	26

		Environmental Management Plan (EMP) Environmental Screening Report (ESR) Environmental Impact Assessment (EIA) submitted on 02.08.13 (Last date of submission of CQAMP 04.01.2014) (CQAMP submitted on 30.12.13).				
MPM2	Contractor`s Programs	No Non-Conformance for submission of Contractor`s Program for 2nd year. (Last date of submission is 04-11-2013.)(Contractor`s Program Submitted on 27-11-13.)	0	1	Each week of delay	0
MPM3	Contractor`s Reports	No Non-Conformance for submission of Contractor`s Reports (Contractor`s all reports submitted on time)	0	2	Each day ofnon receipt after deadline	0
MPM4	Traffic Management	No Non-Conformance for submission of Traffic Management Plan (TMP) (Submission of Initial TMP at least 3 weeks before the start of work on any site.) (TMP Submitted on 12-12-2013)	0	4	Each day of non receipt after deadline or each day of traffic Management non-conformance is recorded	0
MPM5	Inventory Database Management	No Non-Conformance for submission of Inventory	0	2	Each week of delay	0

		Database Management (IDM) (IDM Report Submitted.) (IDM Report Submitted on 11-01-13.)				
MPM6	Detailed Design (A)	No Non-Conformance for Detailed Design (Detail Design submitted.) work program accepted date 29-01-2013. So submission of detailed design is on 12-02-2013 (Submission of DD within 2 weeks after acceptance of the annual program.) 1st year Design Submitted on 29- 05-2013.	0	4	Each week of delay	0
MPM6	Construction Methodology (B)	No Non-Conformance for Construction Methodology (Construction Methodology submitted.) (Submission of CM within 2 weeks after acceptance of the annual program.) Construction Methodology Submitted 12-12-2013	0	4	Each week of delay	
Any MPM	Repeated Non-Conformance	MPM 1 is Repeated for the Month of July-2014 to October-2014, Project related EIA not submitted by the contractor	1	4	Number of Months Since non-conformance first identified.(4)	16

Table 1-13 : Road Durability Performance Measures (RDPM's) – Refer to Weightings in the specification

Date: 01-12-2014Period of Payment: 01/11/2014 to 30/11/2014

Reference to Bidding Document section VI	Item Description	Number of Non-Conformances Recorded A	Number of Non-Conformances Weighting B	Sub-Weighting Days/Weeks/Months of Recorded Non-Conformace	Total Non-Conformance Score AxBxC	Remarks
RDPM2	Payment Roughness	0	5		0	No Non-Conforma recorded during the month
RDPM3	Payment Deflection	0	5		0	No Non-Conformance recorded during the month
RDPM4	Roadway Cut and Embankment Slopes	0	5		0	No Non-Conformance recorded during the month
				Total Road Durability Non-Conformance Score	0	

Road User Safety & Comfort Non-Conformance Score (RUS&CPM'S)

The Non- conformance score as reported by the contractor under this sub head is 68

Analysis of Non Conformances as reported by the Contractor

Sample Reports for March 2013, December, 2013, April 2014 and October 2014 is provided for herewith:-

Table 1-14 : March 2013, Non Conformance Report

Row Labels	All marker posts not painted/marking	All marker posts not painted/repaired	bridge or other structure found in the reach full of debris	Culverts chocked with debris	Culverts found chocked with debris and vegetation	Edge break found on shoulder	Edge break shoulder down at certain stretches	Few sign boards required	Lot of vegetation found	marker posts require painting/repairing	Pavement marking faded require remarking	Pavement surface cracking more than 2%	shoulder found satisfactory	sign boards are missing at certain location	Grand Total
B8	1							1				1	1		**4**
S1							1					1			**2**
S2				1			4				1	6			**12**
S4		1			1	1	2		1			3		1	**10**
S5			2	2						2					**6**
Grand Total	1	1	2	3	1	1	7	1	1	2	1	11	1	1	**34**
% Distribution	**3%**	**3%**	**6%**	**9%**	**3%**	**3%**	**21%**	**3%**	**3%**	**6%**	**3%**	**32%**	**3%**	**3%**	**100%**

Table 1-15: December 2013, Non Conformance Report

Row Labels	cracks in pavement surface	culverts chocked with debris	Debris under bridge	low shoulder compared with sealed surface	Obstruction found on pavement	pot holes in pavement surface	Repeated Non-Conformance of RUS & CPM 1 from Nov-13 to Dec-13 (2 Months)	Repeated Non-Conformance of RUS & CPM 14 from Dec-12 to Dec-13 (13 Months)	Repeated Non-Conformance of RUS & CPM 2 from Aug-13 to Dec-13 (5 Months)	Repeated Non-Conformance of RUS & CPM 9 from Oct-13 to Dec-13 (3 Months)	RPM required	Shoulder Found Non-conforming	water bound on shoulder surface	Grand Total
B8				1			1	1		1	1			5
S1		1	1											2
S2	3	1	1	3	1	1			2				1	13
S4		2			1							1		4
S5												2		2
Grand Total	3	4	2	4	2	1	1	1	2	1	1	3	1	26
	12%	**15%**	**8%**	**15%**	**8%**	**4%**	**4%**	**4%**	**8%**	**4%**	**4%**	**12%**	**4%**	**100%**

Table 1-16 : April 2014, Non Conformance Report

Row Labels	Cracks in pavement surface	Culverts chocked with debris	Obstruction found on pavement	Obstruction found on shoulder on LHS	obstruction found on pavement	Repeated Non-Conformance of RUS & CPM 9 from Dec-14 to April-14 (5 Months)	Repeated Non-Conformance of RUS & CPM 9 from Oct-13 to Jan-14 (13 Months)	Repeated Non-Conformance of RUS & CPM 9 from Oct-14 to April-14 (7 Months)	rpm required	Grand Total
B8							1	1	2	4
S1				1						1
S2	1	5	3		1	1				11
S4		1								1
S5		2	1							3
Grand Total	1	8	4	1	1	1	1	1	2	20
	5%	**40%**	**20%**	**5%**	**5%**	**5%**	**5%**	**5%**	**10%**	**100%**

Table 1-17 : October 2014, Non Conformance Report

Row Labels	Cracks in pavement surface	Culverts chocked with debris	Low shoulder compared with sealed surface	Obstruction found on pavement	Obstruction found on shoulder on LHS	Raised Pavement Markers (RPM)-RPM is missing	Repeated Non-Conformance of RUS & CPM 9 from July-14 to Oct-14 (4 Months)	RPM required	Vegetation found on shoulder	Grand Total
B8		1		1						2
S1					1					1
S2	1	4	1	4		1	1	1		13
S3				1						1
S4				1						1
S5				1					2	3
Grand Total	**1**	**5**	**1**	**8**	**1**	**1**	**1**	**1**	**2**	**21**
	5%	**24%**	**5%**	**38%**	**5%**	**5%**	**5%**	**5%**	**10%**	**1**

Tabulated Non-conformances as reported by the Contractor for the entire length of 2 years is provided for in the Appendix

Further to the various non-conformances as reported by the Contractor, the MC undertook detailed inspection for each road section vide Visual Surveys on the OPRC network. Such exercises shall be undertaken periodically and reported for as part of the envisaged Monthly Reports.

It may be concluded that across all sectors, the MC has noted various defects pertaining to pavement surface types, such as presence of cracks, segregation, patching on pavements that impact riding quality, asphalt deficiency on specific sites, rutting and lateral bulging.

The Non Conformance Report for each section is expected to detail out the site specific issue along with the relevant visuals and suggest the corrective measure to be undertaken. We present herewith some of the preliminary findings

1.5.3 Inferences based upon site visits undertaken during the Inception month

Improvement, Rehabilitation and Resurfacing Works

The initial visits to the various sectors revealed presence of cracks, segregation, patching on pavements, asphalt deficiency on specific sites, rutting, and lateral bulging, implying DEFECTS.

Figure 1-2 : Sector S2 - Raveling km 16+940

Figure 1-3 : Sector S2 – Rutting – k79

Figure 1-4 : Sector S4 – Patching km 14+000

Figure 1-5 : Sector S2 – Cracking – km 7+300

The initial site visits also revealed shortcomings w.r.t routine maintenance:

SHOULDERS MAINTENANCE: On many sites of the network, the scale between of the non-paved shoulders with respect to pavement level is greater than 5 cm (threshold as per the contract). In some places, one can see water accumulation exactly between the edge of the pavement and no-paved shoulders that generate a high risk of water infiltration that directly affects the pavement structure weakening prematurely. This is due to the fact that the routine maintenance is very poor and the shoulder does not have sufficient slope to pave out the drain water. It is also observed that across sectors accumulation of waste placed on shoulders has led to water flow getting obstructed. These deficiencies are observed at rampant in the S5 sector.

VEGETATION CONTROL: On many sectors of the network, vegetation and the trees obstruct both of the visibility of the road and that of the road signages, which must be in line with the specifications of the contract.

Figure 1-6 : S5 - Water and Marking

Figure 1-7: S5 – Cut Vegetation – Km 10 +500

DEFICIENT SIGNS. It must be agreed that the installation and compliance of signal installations should be in accordance according to the IRC 93 – 1985 and IRC 67 – 2001.

DRAINAGE MAINTENANCE Large number of cross drains and others drains are wholly or partially obstructed, resulting in stagnation of the water and subsequent infiltration which in turn may damage to the pavement structure.

Figure 1-8 : Sector S2- Culvert clogged - K 71+800

Figure 1-9 : Sector S2- Culvert clogged - K 77+350

MARKER POST MAINTENANCE With regard to routine maintenance, it is also observed in the different sectors that make up the network that the maintenance of the markings during maintenance and culvert markings is not upto the desired standards. They are further devoid of chainage details .Also, the MC observed that some of the posts that are destroyed warrant replacement.

The MC opines that the aforesaid shortcomings are on account of inadequate onsite manning of the project by the Contractor. As per international experiences, for the present kind of network, it is recommended that groups of 8 and 10 persons be deployed for taking care of routine maintenance per 40 or 50 kilometers of road length. The actual deployment may be adjusted according to yields, local conditions and type of sector.

MARKINGS It may be mentioned that in accordance with clause 15.13.2 of the contract, the Contractor must at its own cost ensure proper markings as and when required and as per with the provisions of the standard IRC 35 -1997.Non conformances were reported in this respect as well,

Figure 1-10 : Sector S3 - Marking lost

Figure 1-11 : Sector S4 – Without Signs of warning in curve

Further, it is observed that in different sectors, the demarcation lines are very thin; even some sections are without center and side line demarcation. The most relevant example is the S5 Sector which is devoid of side lines and wherein the center line practically erased. The sector S2 also house faded markings for much of the stretch.

It may be noted that the demarcation lines are very important and contribute significantly to the safety of road users. Deficiencies in the Routine Maintenance are reported in detail in individual reports for corrective action.

After making the initial visits to the network regarding to Network Performance, in general, it may be concluded that all sectors bear significant shortcomings with regards to routine maintenance, which then amount to DEFECTS. This will impact payment to be meted out to the contractor.

CONTRACTOR PERFORMANCE EVALUATION

In the following paragraphs, we provide for a summarized discussion on the evaluation of contractor performance in wake of the contract specifications. The performance evaluation is discussed in three parts as mentioned below:

DOCUMENTATION: Refers to compliance in the delivery of different documents according to the provisions of Part 2A of the contract entitled "Specification of works and Network Performance" in Item 14. At this point and post review of the documentation as provided by both the client and the contractor, it may be concluded that the minimum documents as required for the purpose of evaluation are mostly in place.

ROAD USER SERVICE AND COMFORT PERFORMANCE MEASURES: As per the contract specifications, this assessment relates to the quantification of all damages, deficiencies in the road and at different elements of the road infrastructure (assets), according to the summary assessment presented in the previous section. With respect to these measures, it is reported that according to the contract, the contractor shall be granted a reasonable time to correct any Defects found. In case of failure to rectify the slated defects the procedure laid down in Paragraph 18 of the specifications shall be applied to assess the quantum of fee cut

ROAD DURABILITY PERFORMANCE MEASURES: Refers to the measures discussed in Paragraph 16 - Part 2A of the specifications. It comprises the measurements made by the

contractor to protect the pavement and the active surface of the pavement. The following discuss the condition as encountered with each type of measure:

MINIMUM ANNUAL ASSET PRESERVATION QUANTITIES: Basically this measure pertains to the implementation of the annual program of the contractor who is currently approved for three years. In this sense and according to a previous chapter, in which the annual program was analyzed of the contractor, the contractor is close to completing the second year of activities, so if the contractor does not comply with the program of work established for improvement, rehabilitation and resurfacing, it may be incurring Liquidated Damage accordance with clause 39 of the contract.

PAVEMENT ROUGHNESS The roughness is a measure of comfort of road users and in accordance with the provisions of paragraphs 8 and 16 of Part 2A of the contract specifications, the liability of the measure is the employer, who must measure semiannually the values corresponding to parameter which is the IRI (International Roughness Index).

Regarding the above and based upon the site visits undertaken, we have noticed that some sectors of the network might exceed the threshold and Level of Service required in the specifications of the contract.

It is also important say that the client has in its possession ROMDAS, used for the measurement of the aforesaid parameter with great precision. Therefore, the said equipment should be calibrated and checked for.

Finally, we need to state that the contractor has carried out a review of the IRI of the sectors that have been the subject of works of improvement, rehabilitation and / or resurfacing except S4 Sector. It may be observed that the individual values on an average range between 1 and 1.5 m/km, that initially is bellow of the thresholds established in the contract, but that are different from our subjective evaluation. Therefore it is necessary to verify the results at the earliest.

In accordance with the Clause 8.2.2 of the specifications of the contract, it may be concluded that the contractor shall ensure that the roughness of the paved surface conforms to the criteria throughout the duration of the contract.

DETAILED INSPECTION

In order to know the initial state of the road network, the Monitoring Consultant undertook a detailed inspection in which it is found some defects that is enclosed in the following tables, including the technical recommendation.

Location	Performance Measure Code (MPM/RUS&CPM/RDMP)	Description and Photograph Record		MC Observation/s	Planned Corrective Action
S1 Km 0.200 to 0.500 (LHS)	RUS&CPM-1	High Severity Cracking Up to 3mm to 10 mm width		The cracks would develop further and result in a pothole	Need to remove block cracking and undertake maintenance work
S1 Km 0.200 to 0.500 (LHS)	RUS&CPM-1	Identified high severity cracking Up to 10mm to 20 mm width		The cracks would develop further and result in a pothole	Need to remove block cracking and undertake maintenance work
S1 Km 0.200 to 0.500 (LHS)	RUS&CPM-1	Multiple cracks identified Up to 10mm to 20 mm width		The cracks would develop further and result in a pothole	Need to remove block cracking and undertake maintenance work
S1 Km 2.300 (LHS)	RUS&CPM-7	Defect Vegetation		Remove Vegetation for clear visibility of sign board	Remove Vegetation
S1 Km 2.800 (LHS)	RUS&CPM-1	Local Deformations		The pavement on this sector has many deformations and undulations that directly affect the safety of the road users.	Immediate requirement of maintenance
S1 Km 3+050 (LHS)	RUS&CPM-1	Local Deformations		The pavement on this sector has many deformations and undulations that directly affect the safety of the road users..	Immediate requirement of maintenance

S1 **Km 3.260 (LHS)**	RUS&CPM-7	Defect Vegetation		Obstructive Vegetation creating hindrance towards clear visibility of sign board	Requirement of devegetation and cutting the tree branches etc.
S1 **Km 4.205 (RHS)**	RUS&CPM-7	Defect Vegetation		Obstructive Vegetation creating hindrance towards clear visibility of sign board	Requirement of devegetation and cutting the tree branches etc.
S1 **Km 5.250 (RHS)**	RUS&CPM-7	Defect Vegetation		Obstructive Vegetation creating hindrance towards clear visibility of sign board	Requirement of devegetation and cutting the tree branches etc.
S1 **Km 5.470 (LHS)**	RUS&CPM-1	Potholes		Required to fill potholes so as to avoid humps	Fill potholes with emulation bated bitumen mix
S1 **Km 8.100 (LHS)**	RUS&CPM-7	Defect Vegetation		Obstructive Vegetation disabling clear visibility – agreement	Requirement of devegetation and cutting the tree branches etc.
S1 **Km 8.500 (LHS)**	RUS&CPM-7	Defect Vegetation		Obstructive Vegetation disabling clear visibility – agreement	Requirement of de-vegetation and cutting the tree branches etc.
S1 **Km 9.504 (LHS)**	RUS&CPM-7	Defect Vegetation		Obstructive Vegetation disabling clear visibility – agreement	Requirement of de-vegetation and cutting the tree branches etc.

S1 **Km 9.780 (LHS)**	RUS&CPM-8	Defect Information Board		Lacks proper road signage	Install Information Board (School 200m Ahead)
S1 **Km 11.200 (RHS)**	RUS&CPM-14	Marker Post Maintenance		Absence of hazard board	Install warning/road sign board & provide culvert sign board.
S1 **Km11+250 (RHS)**	RUS&CPM-7	Defect Vegetation		Obstructive Vegetation creating hindrance towards clear visibility of sign board	Requirement of de-vegetation and cutting the tree branches etc.

Table 1-18: Inspection and Defects Report of S1

Network Performance Inspection Form	FORM RM03
Inspector's Name: Inderjeet Saini and Varinder Singh	
Date of Inspection:	
Road Inspected: S2 (Bhawanigarh, Sunam, Mansa upto Kotshamir) Km 2+200 to Km 106+130	

Location	Performance Measure Code (MPM/RUS&CPM/ RDMP)	Description and Photograph Record		MC Observation/s	Planned Corrective Action
S2 Km 3+000 (LHS)	RUS&CPM-2	Disposal Material		Disposal Material on Earthen Shoulder	Remove Disposal Material from earthen shoulder
S2 Km 3+400 (LHS)	RUS&CPM-7	Defect Vegetation		Remove Vegetation for clear visibility	Remove Vegetation
S2 Km 3+900 (LHS)	RUS&CPM-7	Defect Vegetation		Remove Vegetation for clear visibility of sign board	Remove Vegetation
S2 Km 10+300 (LHS)	RUS&CPM-2	Pavement Edge Drops and unsealed shoulder		Use subgrade soil on earthen shoulder compact it properly & make it equal to pavement outer edge	Use subgrade soil

S2 Km 10+250 (LHS)	RUS&CPM-2	Pavement Edge Drops and unsealed shoulder		Use subgrade soil on earthen shoulder compact it properly & make it equal to pavement outer edge	Use subgrade soil
S2 Km 10+320 (LHS)	RUS&CPM-2	Pavement Edge Drops and unsealed shoulder		Use subgrade soil on earthen shoulder compact it properly & make it equal to pavement outer edge	Use subgrade soil
S2 Km 4+300 (LHS)	RUS&CPM-8 & 14	Hazard Board missing & No culvert remark		Install Hazard Board & mention culvert remark	Install Hazard Board & mention culvert remark
S2 Km 4+700 (LHS)	RUS&CPM-8 & 14	Hazard Board missing & No culvert remark		Install Hazard Board & mention culvert remark	Install Hazard Board & mention culvert remark
S2 Km 5+000 (LHS)	RUS&CPM-8 & 14	Hazard Board missing & No culvert remark		Install Hazard Board & mention culvert remark	Install Hazard Board & mention culvert remark
S2 Km 6+300 (LHS)	RUS&CPM-8	Damaged Hazard Board		Rectify Hazard Board	Rectify Hazard Board

S2 Km 7+700 (LHS)	RUS&CPM-8	Hazard Board missing		Install Hazard Board	Install Hazard Board
S2 Km 7+300 (LHS)	RUS&CPM-1	Lack of fine material		Required Fog spray	Required Fog spray
S2 Km 7+300 (LHS)	RUS&CPM-2	Pavement Edge Drops and unsealed shoulder		Remove unsuitable soil & use subgrade soil as per IS 2720 (part-8)	Use subgrade soil
S2 Km 7+700 (LHS)	RUS&CPM-8	Hazard Board missing		Install Hazard Board	Install Hazard Board
S2 Km 7+700 (LHS)	RUS&CPM-1	Lack of fine material		Required Fog spray	Required Fog spray

S2 Km 7+700 (LHS)	RUS&CPM-8	Hazard Board missing		Install Hazard Board	Install Hazard Board
S2 Km 7+300 (RHS)	RUS&CPM-1	Small Cracks		The cracks soon will become in pothole, increasing the danger to road users	Required Fog spray
S2 Km 7+300 (RHS)	RUS&CPM-1	Small Cracks		The cracks soon will become in pothole, increasing the danger to road users	Required Fog spray
S2 Km 7+400 (LHS)	RUS&CPM-1	Surface Texture is very Ruff		Required Fog Spray	Required Fog spray
S2 Km 9+000 (RHS)	RUS&CPM-8 & 14	Hazard Board missing & No culvert remark		Install Hazard Board & mention culvert remark	Install Hazard Board & mention culvert remark

S2 Km 10+300 (LHS)	RUS&CPM-2	Pavement Edge Drops and unsealed shoulder		Use subgrade soil on earthen+ shoulder compact it properly & make it equal to pavement outer edge	Use subgrade soil
S2 Km 14+500 (LHS)	RUS&CPM-8 & 14	Hazard Board missing & No culvert remark		Install Hazard Board & mention culvert remark	Install Hazard Board & mention culvert remark
S2 Km 14+500 (RHS)	RUS&CPM-8	Hazard Board missing		Install Hazard Board	Install Hazard Board
S2 Km 16+000 (LHS)	RUS&CPM-2	Pavement Edge Drops and unsealed shoulder		Use subgrade soil on earthen shoulder compact it properly & make it equal to pavement outer edge	Required subgrade soil
S2 Km 16+000 (LHS)	RUS&CPM-7	Defect Vegetation		Remove Vegetation for clear visibility	Remove Vegetation

S2 Km 16+940 (LHS)	RUS&CPM-1	Ravelling		Required Fog spray	Required Fog spray
S2 Km 17+300 (RHS)	RUS&CPM-8	Hazard Board missing		Install Hazard Board	Install Hazard Board
S2 Km 18+500 (LHS)	RUS&CPM-8	Damaged Sign Board		Rectify Sign Board	Repaired Sign Board
S2 Km 18+600	RUS&CPM-14	Delineators		Install reflective Delineators for indicate Median Kerb	Required Delineators to avoid accidents
S2 Km 18+620	RUS&CPM-8	Dusty Sign Board		Required Clean Sign Board	Required cleaning for Visibility during night

S2 Km 18+700 (LHS)	RUS&CPM-8 & 14	Hazard Board missing & No culvert remark		Install Hazard Board & mention culvert remark	Install Hazard Board & mention culvert remark
S2 Km 18+700 (RHS)	RUS&CPM-7	Defect Vegetation		Remove Vegetation for clear visibility of sign board	Remove Vegetation
S2 Km 19+300 (RHS)	RUS&CPM-7	Defect Vegetation		Remove Vegetation for clear visibility of sign board	Remove Vegetation
S2 Km 19+300 (LHS)	RUS&CPM-14	No culvert remark		Mention culvert remark	Mention culvert remark
S2 Km 25+000	RUS&CPM-1	Damaged Median		Repair Median	Repair Median

S2 Km 26+300	RUS&CPM-1	No cleaning		Required Cleaning on R.O.B	Cleaning Required
S2 Km 28+000	RUS&CPM-14	Delineators		Install reflective Delineators for indicate Median Kerb	Required Delineators to avoid accidents
S2 Km 56+400 (LHS)	RUS&CPM-1	Faid Pavement Edge marking		Required Pavement marking	Required Pavement marking
S2 Km 56+400 (RHS)	RUS&CPM-1	Faid Pavement Edge marking		Required Pavement marking	Required Pavement marking
S2 Km 72+000 (LHS)	RUS&CPM-7	Defect Vegetation		Remove Vegetation for clear visibility	Remove Vegetation

S2 Km 71+600 (LHS)	RUS&CPM-7	Defect Vegetation		Remove Vegetation for clear visibility	Remove Vegetation
S2 Km 71+000 (RHS)	RUS&CPM-8 & 14	Hazard Board missing & No culvert remark		Install Hazard Board & mention culvert remark	Install Hazard Board & mention culvert remark
S2 Km 71+800 (RHS)	RUS&CPM-8 & 14	Hazard Board missing & No culvert remark		Install Hazard Board & mention culvert remark	Install Hazard Board & mention culvert remark
S2 Km 71+800 (RHS)	RUS&CPM-7	Defect Culvert clogged		Remove Vegetation and required cleaning	Remove Vegetation required cleaning
S2 Km 71+600 (LHS)	RUS&CPM-8	Damaged Hazard Board		Rectify Hazard Board	Rectify Hazard Board

S2 Km 72+500 (LHS)	RUS&CPM-7	Defect Vegetation		Remove Vegetation for clear visibility of sign board	Remove vegetation
S2 Km 72+800 (LHS)	RUS&CPM-14	No culvert remark		Mention culvert remark	Mention culvert remark
S2 Km 74+200 (LHS)	RUS&CPM-14	No culvert remark		Mention culvert remark	Mention culvert remark
S2 Km 74+400 (LHS)	RUS&CPM-14	No culvert remark		Mention culvert remark	Mention culvert remark
S2 Km 75+300 (BHS)	RUS&CPM-8 & 14	Hazard Board missing & No culvert remark		Install Hazard Board & mention culvert remark	Install Hazard Board & mention culvert remark

S2 Km 73+200	RUS&CPM-7	Defect Vegetation		Remove Vegetation for clear visibility	Remove vegetation
S2 Km 73+200 (LHS)	RUS&CPM-2	Pavement Edge Drops and unsealed shoulder		Remove unsuitable soil & use subgrade soil as per IS 2720 (part-8)	Use subgrade soil
S2 Km 74+000 (LHS)	RUS&CPM-14	No culvert remark		Mention culvert remark	Mention culvert remark
S2 Km 75+300 (RHS)	RUS&CPM-8	Damaged Hazard Board		Rectify Hazard Board	Rectify Hazard Board
S2 Km 75+000	RUS&CPM-7	Defect Vegetation		Remove Vegetation for clear visibility of sign board	Remove vegetation

S2 Km 75+600 (LHS)	RUS&CPM-14	No culvert remark		Mention culvert remark	Mention culvert remark
S2 Km 76+000 (LHS)	RUS&CPM-8 & 14	Hazard Board missing & No culvert remark		Install Hazard Board & mention culvert remark	Install Hazard Board & mention culvert remark
S2 Km 74+400 (LHS)	RUS&CPM-1	Small Cracks		The cracks soon will become in pothole, increasing the danger to road users	Required Fog spray
S2 Km 71+000 (LHS)	Not Mentioned	Damaged abutment wall		Maintained Abutment wall	Required Maintenance
S2 Km 71+000 (LHS)	RUS&CPM-8	Damaged Hazard Board		Rectify Hazard Board	Rectify Hazard Board

S2 Km 76+700 (LHS)	RUS&CPM-14	No culvert remark		Mention culvert remark	Mention culvert remark
S2 Km 77+700 (LHS)	RUS&CPM-14	No culvert remark		Mention culvert remark	Mention culvert remark
S2 Km 78+200 (LHS)	RUS&CPM-14	No culvert remark		Mention culvert remark	Mention culvert remark
S2 Km 77+400 (LHS)	RUS&CPM-7	Defect Vegetation		Remove Vegetation for clear visibility	Remove vegetation
S2 Km 72+000 (LHS)	RUS&CPM-7	Defect Vegetation		Remove Vegetation for clear visibility	Remove vegetation

S2 Km 77+352 (RHS)	RUS&CPM-14	No culvert remark		Mention culvert remark	Mention culvert remark
S2 Km 77+352 (LHS)	RUS&CPM-3	Water Pond on earthen Shoulder		Remove Water from Pavement Edge	Remove water
S2 Km 77+352 (LHS)	RUS&CPM-3	Water Pond on earthen Shoulder and- Culvert clogged		Remove Water from Pavement Edge and cleaning culvert	Remove water and cleaning culvert
S2 Km 78+000 (LHS)	RUS&CPM-7	Defect Vegetation		Remove Vegetation for clear visibility	Remove vegetation
S2 Km 78+500 (LHS)	RUS&CPM-7	Defect Vegetation		Remove Vegetation for clear visibility of sign board	Remove vegetation

S2 Km 78+950 (RHS)	RUS&CPM-14	No culvert remark		Mention culvert remark	Mention culvert remark
S2 Km 79+050 (RHS)	RUS&CPM-1	Deflection Found on New Surface		Rectify the deflection area	marking
S2 Km 79+000 (RHS)	RUS&CPM-1	Deflection Found on New Surface		Rectify the deflection area	Rectify the deflection area to avoid accidents
S2 Km 79+000 (RHS)	RUS&CPM-1	Defect Pavement Marking		Required New Pavement marking	Required New Pavement marking
S2 Km 78+000 (LHS)	RUS&CPM-8	Damaged Sign Board		Install New Sign Board	Required new sign board

S2 Km 68+000	RUS&CPM-14	Delineators		Install reflective Delineators for indicate Median Kerb	Required Delineators to avoid accidents
S2 Km 68+000	RUS&CPM-8	Damaged Sign Board		Rectify Sign Board	Rectify Sign Board
S2 Km 68+000 (RHS)	RUS&CPM-11	Dust and Debris on island		Required to clean Island	Required cleaning

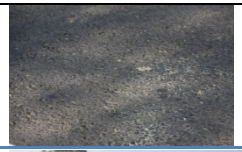
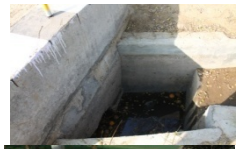
Table 1-19: Inspection and Defects Report of S2

Network Performance Inspection Form		FORM RM03			
Inspector's Name: Inderjeet Saini and Varinder Singh					
Date of Inspection:					
Road Inspected: S3 (Barnala-Mansa) Km 119+640 to Km 126+930					
Location	**Performance Measure Code (MPM/RUS&CPM/RDMP)**	**Description and Photograph Record**		**MC Observation/s**	**Planned Corrective Action**
S3 KM 1+00 LHS	RUS&CPM-7	Vegetation Problem		Sign board not visible	Removal of Vegetation or Requirement of DE vegetation and cutting the tree branches etc.
S3 KM 4+00 - Median	RUS&CPM-1	Damaged Median		Damaged median can cause accident	Maintenance of damaged Median
S3 KM 4+00 - Median	RUS&CPM-14	Defect		There is no Cat eye, delineator& Chevron marking	Adopt the road safety norms as per IRC-67
S3 KM 7+00 LHS	RUS&CPM-14	Defect		Damaged Hazard board and culvert signage not present	Install road safety warning and information sign including the culvert sign board.

S3 KM 7+00 LHS	RUS&CPM-14	Defect		Hazard board not inserted properly and no culvert marking	Install road safety warning and information sign including the culvert sign board.
S3 KM 6+00 centre/BS	RUS&CPM-10	Defect		Poor maintenance of road marking	Maintain centre and edge thermoplastic marking

Table 1-20: Inspection and Defects Report of S3

Network Performance Inspection Form					FORM RM03
Inspector's Name: Inderjeet Saini and Varinder Singh					
Date of Inspection					
Road Inspected: S4 (Ram Diteywala to Ramtirath Jaga) km 0+000 to Km 24+970					
Location	**Performance Measure Code (MPM/RUS&CPM/RDMP)**	**Description and Photograph Record**		**MC Observation/s**	**Planned Corrective Action/work done**
S-4 KM 1+700 to2+315 LHS	RUS&CPM-10	Thermoplastic pavement marking Centre		Pavement Centre line marking (Thermoplastic)	Action taken
S-4 KM 6+200 to 8+200LHS	RUS&CPM-10	Thermoplastic marking Edge		Thermoplastic Edge marking	Action taken
S-4 KM 6+000 LHS	RUS&CPM-10	Vegetation Problem (Curve)		Sign board not visible on curve portion	Removal of wild vegetation and cutting of tree branches
S-4 KM 6+000 LHS	RUS&CPM-10	R P M (curve)		R P M Required on curve portion	Action not taken
S-4 KM 6+200 to8+050 R/s	New pavement Resurfacing	Edge marking		Thermoplastic pavement Edge marking	Action taken

S-4 KM 7+00 B/s	RUS&CPM-1	Surface texture rough		Surface texture rough	Maintenance with fog Seal/MSS
S-4 KM 12+000	RUS&CPM-10	No Thermoplastic marking		There is no Center & pavement Edge marking B/S	Maintenance of pavement Thermoplastic marking
S-4 KM 13+500 LHS	RUS&CPM-1	Patch poorly constructed (roughness)		patch work(5x5)	Maintain standard as per technical requirement.
S-4 KM 13+500 LHS – KM 14+000	RUS&CPM-10	No Thermoplastic marking		There is no Center & pavement Edge marking B/S	Maintain centre and pavement edge thermoplastic marking
S-4 KM 14+00LHS	RUS&CPM-1	Patch poorly constructed (roughness)		patch work(5x15)	Maintain standard as per technical requirement.
S-4 KM 21+000(Center)	RUS&CPM-10	Thermoplastic centre marking		Thermoplastic center marking	Action taken
S-4 KM 21+415R/s	RUS&CPM-3	Plaster work not completed and Sector and Culvert clogged		Plaster work to be completed and culvert to be cleaned	Action taken
S-4 KM 21+415R/s	RUS&CPM-14	No hazard board		Install Hazard board for safety	Maintenance of road signs

KM22+500 to23+400 R/s	RUS&CPM-10	Thermoplastic Edge marking		Thermoplastic Edge marking	Action taken

Table 1-21 : Inspection and Defects Report for S4

Network Performance Inspection Form				FORM RM03	
Inspector's Name: Inderjeet Saini					
Date of Inspection					
Road Inspected: S5 (Dhanoaula to Bhikhi) Km 0+000 to Km 25+940					
Location	**Performance Measure Code (MPM/RUS&CPM /RDMP)**	**Description and Photograph Record**		**MC Observation/s**	**Planned Corrective Action**
S5 Km 7+000 – 8+000 (LHS)	RUS&CPM-2	Pavement Edge Drops and unsealed shoulder		Use subgrade soil on earthen shoulder. Compact it properly & make it equal to pavement outer edge(3 sites)	Protection of pavement edges by brick on edge or locally available stones.
S5 Km 10+000 (RHS)	RUS&CPM-2	Pavement Edge Drops and unsealed shoulder		Use subgrade soil on earthen shoulder. Compact it properly & make it equal to pavement outer edge	Protection of pavement edges by brick on edge or locally available stones.
S5 Km 10+000 (RHS)	RUS&CPM-2	Defect Vegetation		Remove Vegetation for clear visibility of sign board	Protection of pavement edges by brick on edge or locally available stones.
S5 Km 10+500	RUS&CPM-7	Defect Vegetation		Remove Vegetation for clear visibility of sign board	removal of vegetation

S5 Km 10+500	RUS&CPM-3	Water pond - poor maintenance of the earthen shoulder		Possible drainage of the water pavement structure	Permanente maintenance of the pavement-shoulder.
S5 Km 14+650 (LHS)	RUS&CPM-2	Pavement Edge Drops and unsealed shoulder		Use subgrade soil on earthen shoulder. Compact it properly & make it equal to pavement outer edge	Protection of pavement edges by brick on edge or stones etc.
S5 Km 14+650 (LHS)	RUS&CPM-8 & 14	Hazard Board missing & No culvert remark		Install Hazard Board & mention culvert remark	culvert sign board
S5 Km 14+650 (RHS)	RUS&CPM-8 & 14	Hazard Board missing & No culvert remark		Install Hazard Board & mention culvert remark	culvert sign board
S5 Km 20+000	RUS&CPM-2	Defect Vegetation		Remove Vegetation for clear visibility of sign board	Removal of vegetation.
S5 Km 22+000 (LHS)	RUS&CPM-2	Pavement Edge Drops and unsealed shoulder		Use subgrade soil on earthen shoulder. Compact it properly & make it equal to pavement outer edge	Protection of pavement edges by brick on edge or stones on edge etc.

S5 Km 22+00 – 23+00 (LHS)	RUS&CPM-2	Pavement Edge Drops and unsealed shoulder		Use subgrade soil on earthen shoulder. Compact it properly & make it equal to pavement outer edge	Protection of pavement edges by brick on edge or stones on edge etc.
S5 Km 23+00- 24+00 (LHS)	RUS&CPM-2	Pavement Edge Drops and unsealed shoulder		Use subgrade soil on earthen shoulder. Compact it properly & make it equal to pavement outer edge	Protection of pavement edges by brick on edge or stones on edge etc.
S5 Km 24+000	RUS&CPM-8	Hectometre Sign Damaged		Install Hectometre Board Properly	Maintain as per requirement of technical specifications
S5 Km 24+500	RUS&CPM-2	Disposal Material or Debris		Remove Disposal Material	Environment Impact Assessment
S5 Km 25+000 (RHS)	RUS&CPM-3	Water flow along pavement edge		Water flow damage the pavement edge so maintain it	Maintenance of Drainage system on the Pavement.
S5 Km 25+100 (RHS)	RUS&CPM-8 & 14	Hazard Board missing & No culvert remark		Install Hazard Board & mention culvert remark	No culvert remark/Hazard board

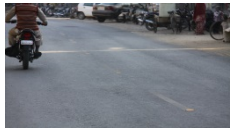
S5 Km 25+100 (RHS)	RUS&CPM-08	Disturbed road signs		Maintain sign board	Maintain sign board for road user service
S5 Km 25+200	RUS&CPM-14	parapet wall damage		Maintain parapet wall	Maintain parapet wall for road user service
S5 Km 25+200	RUS&CPM-1	Fade Pavement marking		Required Pavement marking	Born out pavement marking

Table 1-22: Inspection and Defects Report of S5

Network Performance Inspection Form	FORM RM03
Inspector's Name: Inderjeet Saini and varinder singh	
Date of Inspection: 26-11-2014	
Road Inspected: B8 (Bathinda, Kotshamir, Talwandi sabo road up to Ramtirath jaga) Km 9+200 to Km 37+850	

Location	Performance Measure Code (MPM/RUS&CPM/RDMP)	Description and Photograph Record		MC Observation/s	Planned Corrective Action
B8 Km 9+400 (LHS)	RUS&CPM-7	Vegetation		Remove Vegetation for clear visibility of sign board	Remove Vegetation for clear visibility of sign board
B8 Km 9+400	RUS&CPM-14	Delineators		Install reflective Delineators for indicate Median Kerb	Install reflective Delineators for indicate Median Kerb
B8 Km 10+000 (LHS)	RUS&CPM-11	No Cleaning		Require Cleaning	Require Cleaning
B8 Km 10+000 (RHS)	RUS&CPM-11	No Cleaning		Require Cleaning	Require Cleaning

B8 Km 11+000 (LHS)	RUS&CPM-14	No Culvert Remark		Required Culvert marking	Required Culvert marking
B8 Km 12+930 (LHS)	RUS&CPM-8 & 14	Hazard Board & Culvert remark Missing		Required hazard board & Culvert marking	Required hazard board & Culvert marking
B8 Km 11+000 (LHS)	RUS&CPM-8	Hazard Board Missing		Require Hazard Board	Require Hazard Board
B8 Km 14+330 (LHS)	RUS&CPM-8 & 14	Hazard Board & Culvert remark Missing		Required hazard board & Culvert marking	Required hazard board & Culvert marking
B8 Km 14+530 (LHS)	RUS&CPM-7	Vegetation		Remove Vegetation for clear visibility of sign board	Remove Vegetation for clear visibility of sign board
B8 Km 10+950 (LHS)	RUS&CPM-8 & 14	Hazard Board not clean & No culvert remark		Clean Hazard Board & Mention Culvert remark	Clean Hazard Board & Mention Culvert remark
B8 Km 10+190 (LHS)	RUS&CPM-8 & 14	Hazard Board & Culvert remark Missing		Required hazard board & Culvert marking	Required hazard board & Culvert marking

B8 Km 10+260 (LHS)	RUS&CPM-8 & 14	Hazard Board Damaged & No culvert remark		Rectify Hazard Board & Mention Culvert remark	Rectify Hazard Board & Mention Culvert remark
B8 Km 10+260 (RHS)	RUS&CPM-8 & 14	Hazard Board Damaged & No culvert remark		Rectify Hazard Board & Mention Culvert remark	Rectify Hazard Board & Mention Culvert remark
B8 Km 11+500 (LHS)	RUS&CPM-2	Pavement Edge Drops and unsealed shoulder		Use subgrade soil on earthen shoulder compact it properly & make it equal to pavement outer edge	Use subgrade soil on earthen shoulder compact it properly & make it equal to pavement outer edge
B8 Km 11+900 (LHS)	RUS&CPM-2	Pavement Edge Drops and unsealed shoulder		Use subgrade soil on earthen shoulder compact it properly & make it equal to pavement outer edge	Use subgrade soil on earthen shoulder compact it properly & make it equal to pavement outer edge
B8 Km 11+940	RUS&CPM-8	Sign Board Damaged		Required to install properly Sign board	Required to install properly Sign board
B8 Km 11+030 (LHS)	RUS&CPM-8 & 14	Hazard Board not clean & No culvert remark		Clean Hazard Board & Mention Culvert remark	Clean Hazard Board & Mention Culvert remark

B8 Km 11+190	RUS&CPM-8 & 14	Hazard Board missing & No culvert remark		Required hazard board & Culvert marking	Required hazard board & Culvert marking
B8 Km 11+900 (LHS)	RUS&CPM-7	Vegetation		Remove Vegetation for clear visibility of sign board	Remove Vegetation for clear visibility of sign board
B8 Km 11+950 (LHS)	RUS&CPM-1	Lack of fine material		Required Fog spray	Required Fog spray
B8 Km 11+960 (LHS)	RUS&CPM-8 & 14	Hazard Board missing & No culvert remark		Required hazard board & Culvert marking	Required hazard board & Culvert marking
B8 Km 12+000 (LHS)	RUS&CPM-14	No culvert remark		Required Culvert marking	Required Culvert marking
B8 Km 14+400 (LHS)	RUS&CPM-14	No culvert remark		Required Culvert marking	Required Culvert marking
B8 Km 13+010 (LHS)	RUS&CPM-8 & 14	Hazard Board missing & No culvert remark		Required hazard board & Culvert marking	Required hazard board & Culvert marking

B8 Km 13+010 (LHS)	RUS&CPM-4	No plaster on Head wall		Required plaster on headwall	Required plaster on headwall
B8 Km 13+010 (LHS)	RUS&CPM-1	Lack of fine material		Required Fog spray	Required Fog spray
B8 Km 14+885 (LHS)	RUS&CPM-7	Vegetation		Remove Vegetation for clear visibility of sign board	Remove Vegetation for clear visibility of sign board
B8 Km 14+600 (LHS)	RUS&CPM-1	Pavement inner edge is not sealed with Kerb		Required to seal pavement inner edge	Required to seal pavement inner edge
B8 Km 14+885	RUS&CPM-11	Dust and Debris on island		Required to clean Island	Required to clean Island
B8 Km 16+200 (LHS)	RUS&CPM-8 & 14	Hazard Board missing & No culvert remark		Required hazard board & Culvert marking	Required hazard board & Culvert marking
B8 Km 16+814 (LHS)	RUS&CPM-14	No culvert remark		Required Culvert marking	Required Culvert marking

B8 Km 19+800 (LHS)	RUS&CPM-1	Faid Pavement Edge marking		Required Pavement marking	Required Pavement marking
B8 Km 19+800 (RHS)	RUS&CPM-1	Faid Pavement Edge marking		Required Pavement marking	Required Pavement marking
B8 Km 23+150 (LHS)	RUS&CPM-1	Level not maintain according to TCS		Required to follow the typical cross section	Required to follow the typical cross section
B8 Km 23+200 (LHS)	RUS&CPM-1	No tray test on Binder		No tray test on Binder	Required to do tray test on binder
B8 Km 23+200 (LHS)	RUS&CPM-1	No Tack coat spray properly on full width		Spray tack coat Properly on required surface	Spray tack coat Properly on required surface
B8 Km 23+020 (LHS)	RUS&CPM-1	Cat Eye did not remove before laying		Remove cat eyes form existing surface	Remove cat eyes form existing surface
B8 Km 25+400 (LHS)	RUS&CPM-1	No Core cutting after Laying		Required core cutting after laying Bitumen	Required core cutting after laying Bitumen

B8 Km 25+000 (LHS)	RUS&CPM-2	Pavement Edge Drops and unsealed shoulder		Use subgrade soil on earthen shoulder compact it properly & make it equal to pavement outer edge	Use subgrade soil on earthen shoulder compact it properly & make it equal to pavement outer edge
B8 Km 24+500 (LHS)	RUS&CPM-2	Pavement Edge Drops and unsealed shoulder		Use subgrade soil on earthen shoulder compact it properly & make it equal to pavement outer edge	Use subgrade soil on earthen shoulder compact it properly & make it equal to pavement outer edge
B8 Km 27+380 (LHS)	RUS&CPM-2	Pavement Edge Drops and unsealed shoulder		Use subgrade soil on earthern shoulder compact it properly & make it equal to pavement outer edge	Use subrade soil on earthern shoulder compact it properly & make it equal to pavement outer edge
B8 Km 35+390 (LHS)	RUS&CPM-2	Unsuitable soil using on Earthen Shoulder		Remove unsuitable soil & use subgrade soil as per IS 2720 (part-8)	Remove unsuitable soil & use subgrade soil as per IS 2720 (part-8)
B8 Km 35+425 (LHS)	RUS&CPM-2	Unsuitable soil using on Earthen Shoulder		Remove unsuitable soil & use subgrade soil as per IS 2720 (part-8)	Remove unsuitable soil & use subgrade soil as per IS 2720 (part-8)

B8 Km 35+460 Km 35+7000 (LHS)	RUS&CPM-2	Unsuitable soil using on Earthen Shoulder		Remove unsuitable soil & use subgrade soil as per IS 2720 (part-8)	Remove unsuitable soil & use subgrade soil as per IS 2720 (part-8)

Table 1-23A : Inspection and Defects Report of B8

The Defects Report for B8 is given in the Appendix.

1.6 Inventory Database Report

The Contractor has been maintaining and reporting the following databases:-

S.N	Type of Database	Database Coverage
1	Road Inventory Data Sheet	Terrain (Plain/Rolling Hilly), Land use (Built up/Agrt./Forest/Industrial/Barren), Name of Village/Town, Carriageway, Shoulder, Embankment Ht/ Depth of Cutting, Submergence (cm), Location (km), Road No. (km), Type of Road, Carriageway Width (m), Cross Road Leads Towards, Road Intersection Type & Detail), Curves, Retaining Structure, Location of Water Bodies(Lakes & Reservoirs etc.), Row, Tree Detail, Utilities, Road Side Arboriculture, General Drainage Condition, remarks, Sign Boards, Hectometer Stone, Safety Pillar, Condition Safety Pillar & Hectometer, Delineators and studs, Street light, Structure Condition Remarks.
2	Inventory and Condition for Major Bridge	Existing(Chainage), Name of Bridge, Super structure, Sub Structure, Foundation, Type of Bearing, Type of Expansion Joint, Type of Wearing Coat, Length (m)*, Number of Spans, Length of Span (m), Thickness of pier (m), Thickness of Slab (m), Average vertical clearance**(m), Width of carriageway between kerbs (m), overall width (m), Whether Water Way adequate / Inadequate, Remarks.
3	Inventory and Condition for Minor Bridge	Existing(Chainage), Name of Bridge, Super structure, Sub Structure, Foundation, Type of Bearing, Type of Expansion Joint, Type of Wearing Coat, Length (m)*, Number of Spans, Length of Span (m), Thickness of pier (m), Thickness of Slab (m), Average vertical clearance**(m), Width of carriageway between kerbs (m), overall width (m), Whether Water Way adequate / Inadequate, Remarks.
4	Inventory and Condition for ROB	Mark Chainage, Name of Bridge, Super structure, Sub Structure, Foundation, Type of Bearing, Type of Expansion Joint, Type of Wearing Coat, Length (m)*, Number of Spans, Length of Span (m), Thickness of pier (m), Thickness of Slab (m), Average vertical clearance**(m), Width of carriageway between kerbs (m), overall width (m), Whether Water Way adequate / Inadequate (yes/no), Remarks.
5	Inventory of Structures	Existing(Chainage), Name of Bridge, Super structure, Sub Structure, Foundation, Type of Bearing, Type of Expansion Joint, Type of Wearing Coat, Length (m)*, Number of Spans, Length of Span (m), Thickness of pier (m), Thickness of Slab (m), Average vertical clearance**(m), Width of carriageway between kerbs (m), overall width (m), Whether Water Way adequate / Inadequate, Remarks.
6	Inventory and Condition for Pipe Culvert	Existing Chainage (km), Culvert No., Type of Structures (Pipe / Slab / Box / Arch), Thickness of slab (m)/ crown of Arch, No. of span, Width of culvert / Pipe diam, Piper Width (m), Total Width (m), Carriage way width (m), Slab / Pipe / Box / Arch, Substructure, Head wall, Wing wall, Return wall, Height above Bed level (m), Parapet / Handrail, Observation
7	Inventory and Condition for Slab Culvert	Existing Chainage (km), Culvert No., Type of Structures (Pipe / Slab / Box / Arch), Thickness of slab (m)/ crown of Arch, No. of span, Width of culvert / Pipe diam, Piper Width (m), Total Width (m), Carriage way width (m), Slab / Pipe / Box / Arch, Substructure, Head wall, Wing wall, Return wall, Height above Bed level (m), Parapet / Handrail, Observation

8	Pavement Condition Data Sheet for OPRC Section of S-1	Pavement type, Composition, Condition (Fair/poor/Failed), Speed (Km/Hr), Quality (G/F/P/VP), Cracking (%), Reveling (%), Potholing (No. and % 200 m)**, Rut (None/Moderate/Severe), Patching (No & % 200 m)**, Pavement Edge Drop (cm), Embankment Condition (Good/Fair/Poor), Road Side Drain (NE/PF/F)****, Remarks

Role of Database & Network Inventory Consultant

The Monitoring Consultant is expected to address the following:-

1 Processing and updating of the database
2 Reviewing the existing network database architecture
3 Provide recommendations on improvement in quantity and quality of existing database
4. Render recommendation on asset management system for implementation
5. Integrate capabilities of undertaking time series analysis
6 Integrating the GIS/GPS information within database
7. Providing technical assistance and quality control to validate consistency of databases

Purpose of Database

The basic purposes any of database of any long term project are

1 Fact finding and representing it in quantitative and spatial forms
2 Evaluating the quantum of work carried out
3 Evaluating the coverage of work
4 Evaluating the work on time series basis
5 Answering simple and multiple query
6 Record purposes

Methodology

In order to carry out above objectives the following methodology is suggested

Reviewing the type of reports used and generated

- Time series reports
- Base line reports
- Analysis reports (including spatial, statistical forms)

Reviewing the different type of data bases created and its purposes used

- Spatial databases
- Quantitative databases
- Video/photos database
- Linking of these databases (standalone or jointly)

Study the components of above existing databases maintained

- Reports generated from those databases and data file.
- Data structure of each data files in that database
- Data name, type, units, range of its values etc.
- Primary key of each data file in that database
- Entity relation diagram / data flow diagram

Study and review the data recording, data storage and media along with procedures.

- Any specific formats (like recommended formats of IRC or any other bodies)
- Data redundancy and data security features and related algorithm

Study and review the data collection/ capturing methods used for each data file

- Frequency of data collection
- Mechanical verse manual data collection method or intelligent data collection method

Reviewing the type of software and hardware used for above discussed databases.

The Monitoring Consultant has so far reviewed the following two reports:-

1 The inventory report
2 The inventory database management report

MC's Observations on the Inventory Report

The inventory report provides following data reports

1. Structure inventory report
2. Inventory and condition for pipe/slab culverts
3. Pavement condition data sheet
4. Road inventory data sheet

The Monitoring Consultant would like to clarify whether these submitted reports are inventory reports or Inventory and Condition Survey Report.

The following observations are made with respect to the reports reviewed:

A. Structure Inventory Report

1. Structure ID is not given
2. Geo-referencing of structure missing
3. Example: Page 29 in section S2 details– is this data sheet or report? (If it is data collection sheet (as given as in structure Inventory report) then the number of data collection items are missing like traffic data, design velocity, design discharge, flood level etc. If it is report then why these items are not populated from different data files.
4. Refer: page 30 in detailed condition survey report point 1.1 (1.2) - is it name of bridge or no. of bridge or name of river or type of crossing. What is the exact data item in these? Because type or crossing and bridge name may lead to different data set.
5. Refer: page 31 in 4.0 and in 8.0 there are multiple data entries. If it is report or it is data collection sheet the multiple data entry should not be there further out of multiple remarks which is on priority is not there.
6. Refer: Page 31 in detailed condition report survey report what are the scales to measure like Wearing condition as Fair or expansion joints as poor?
7. Photos Id are not provided
8. Date of data collection is missing which makes the time series analysis difficult

The naming system should be consistent across all the reports. (E.g. In the inventory database management stretches are referred to as S2 while in inventory report everywhere it is mentioned as S2-SH-12A)

B. Inventory and condition for pipe culverts, slab culverts

1. Geo-referencing missing

2. Observations should be made more specific (E.g. half structure is buried, overall condition is fair) Refer Existing chainage 11+150 of S1 section (MDR-21)

3. The data names are different like existing chainage or marked chainage, Culvert no. or bridge name. Refer: Chainage 10+125 of S1 (MDR-21).

4. The name should be given as inventory and condition for culverts as one name (not as separate pipe culvert, slab culvert) for data collection sheet or file or report

5. Refer: mark chainage 44.640 (or it is 44 +640?)or 54+760 in S2 (SH-12A) in slab culvert the data is different as compared to other data fields.

6. Refer: mark chainage 2+680 in S2 section (SH-12A) what is HP in type of structure?

7. There should be different files for inventory and condition for culverts and inventory and condition for bridges and inventory and condition for ROB etc. in order to have better clarity.

C. Pavement condition data/survey sheet

1. The geo-referencing from start point, middle point and at end point should be provided.

2. How to measure the embankment condition as good or fair or bad (Refer: S1,MDR-21 dated 5/1/13)

3. The data sheets are different (Refer: S1,MDR-21 dated 5/1/13 and of S2,SH-12A Dated 4/1/13 and B-8, SH-17 dated 4/1/13) so cannot be analysed as one file.

D. Road inventory data sheet

1. No use of geo referencing seen in this data sheet

2. The data sheets are different (Refer: S1, MDR-21 and of S2,SH-12A) so cannot be analysed as one file

1.6.1 Inventory database management

This report provides following details

1. New construction, widening of pipe and slab culvert details
2. Road assets (sign boards details)
3. Road assets (km stone, hectometre & boundary pillar details)
4. Road assets (road marking)
5. Details of new installed cat eyes

The clarifications related to these reports are as follows

(1) New construction, widening of pipe and slab culvert details

1. Geo referencing is absent
2. Is new construction is same as replacing Ref S5 page 002.
3. Units should be related to data name and not with data itself. Ref S5 page 002.

(2) Road assets (sign boards details)

1. Geo referencing missing

2. Inconsistency in data format sheet refer, page 004 and 005 and 006 and 010

3. Multiple entries in remarks (is repaired and re-installed are mutually exclusive or both)

(3) Road assets (km stone, hectometre & boundary pillar details)

1. Geo referencing missing

(4) Road assets (road marking)

No comments

(5) Details of new installed cat eyes

No comments

Way Forward

The dataset mentioned in the above sections should be collected regularly and submitted to the Monitoring Consultant

1.7 Road Asset Damage& Pavement Repair Report

One of the essential tasks for the MC entail review of measures for monitoring and managing pavement asset consumption, on-going refinement of existing pavement condition modelling including the presentation of advice on the establishment of long term pavement condition calibration sites. The Monitoring Consultant shall prepare and submit a network condition report within 4-weeks following the completion of each of the six monthly roughness surveys and network pavement deflection surveys and the post construction pavement deflection surveys. Post construction surveys will be in addition to the Contractor's construction confirmation quality surveys and will undertake by equipment and manpower provided under the OPRC contract. **The report shall summarize at the minimum the following information:**

- Network Average Surface Texture Depth (where measured) and exceptions from average target texture depths.
- Network Maximum and Average Roughness values for each road category and for sections of new pavement construction.
- Network Average Pavement Deflections for each loading category and post construction pavement deflections.
- Where appropriate a summary of the output from the latest annual run of the Pavement Deterioration Model indicating the impact the current network condition, and completed Resurfacing, Pavement Rehabilitation and Improvement works has had on condition trends and future financial forecasts.

This aforesaid shall contribute to a **Road Asset Damage& Pavement Repair Report** that would provide a summary discussion on the achievement by the Contractor in completing the required quantities of asset preservation works and improvement works and the quality that has been achieved. This information combined with the results of the above surveys shall be used by the Monitoring Consultant to provide comprehensive recommendations to the Client on the extent of any pavement asset consumption that be occurring and nay actions required to address the risk, including any increase or reduction in the annual preservation quantities specified within the OPRC document.

As per the October MPR submitted by the Contractor, the non –conformances identified and addressed by the Contractor w.r.t to Asset Damages and Pavement repair works were checked onsite by the MC. The report based upon sample checks was found to be satisfactory. The inspection report is appended herewith:-

Table 1-24 : Inspection Report w.r.t Asset Damages and Pavement Repair

S.No	Section No	Chainage	Date	Side	Damage Detail	Damage Caused By	Action Taken
1	S-1	7+175	19-10-2014	LHS	Shoulder Toe Wall Damage	Unknown Vehicle	Repair OK
2	S-2	30+640	18-10-2014	LHS	Culvert parapet wall damage	Unknown Vehicle	Repair OK
3	S-2	69+200	21-10-2014	RHS	Parapet wall damage	Unknown Vehicle	Chainage Mismatch
4	S-2	18+200	30-10-2014	B/S	Median Kerb Damage	Unknown Vehicle	Repair OK
5	B-8	20+200	20-10-2014	LHS	Hectometer stone felled down	Unknown Vehicle	Repair OK

Table 1-25 : Pavement Repair Summary – Sample Inspection Based upon October MPR

S.No	Section No	Date	Chainage		Total Length (Mtr)	Description of Work	Side	Remarks
			From	To				
1	B- 8	16 – 10-2014	20+300	20+350	50	Milling of Existing Pavement	B/S	Resurfacing Complete
2	B – 8	16-10-2014	20+600	20+650	50	Milling of Existing Pavement	R/S	Resurfacing Complete
3	B – 8	16-10-2014	21+420	21+440	20	Milling of Existing Pavement	L/S	Resurfacing Complete

4	B – 8	16-10-2014	21+800	22+200	400	Milling of Existing Pavement	L/S	Resurfacing Complete
5	B- 08	09-10-2014	21+400	34+620	1770		R/S	Work accomplished
6	S-2	30-10-2014	32+850	34+250	1400		R/S	Work accomplished
7	S-2	30-10-2014	56+500	57+000	500		R/S	Work unaccomplished
8	S-2	28-10-2014	56+500	58+300	1800		L/S	Work accomplished
9	S-2	26-10-2014	57+730	59+230	1500		R/S	Work accomplished
10	S-2	21-10-2014	57+970	62+230	2500		R/S	Work accomplished
11	S-2	20-10-2014	57+970	62+230	2500		L/S	Work accomplished
12	S-4	28-10-2014	6+200	8+200	2.000		L/S	Work accomplished
13	S-4	28-10-2014	9+600	10+800	1200		R/S	Work accomplished
14	S-4	29-10-2014	15+100	15+600	500		Center	Work accomplished
15	S-4	31-10-2014	21+415	22+615	1200		R/S	Work accomplished

1.8 Road Accident Report

This particular section details out the number of accidents recorded on the OPRC network as per the Contractor's version. The accident statistics updated till November 2014 is presented herewith:

		November Month			Upto Previous Month			Cumulative		
S.No	Road Name	Fatal	Serious Injury	Minor Injury	Fatal	Serious Injury	Minor Injury	Fatal	Serious Injury	Minor Injury
Bhawanigarh – Kotshamir (S-2)										
1	S1	0	0	0	0	0	0	0	0	0
2	S2	0	0	2	16	28	21	16	28	23
3	S3	0	0	0	1	2	2	1	2	2
4	S4	0	0	0	2	0	0	2	0	0
5	S5	0	0	0	3	2	2	3	2	2
6	B8	0	0	0	2	4	3	2	4	3
Total		0	0	2	24	36	28	24	36	30

As per the details provided to the MC, the OPRC network was witness to 24 fatal mishaps, 36 serious injuries and 28 minor injuries. These are cumulative counts since project inception and as reported till November 2014. **The pertinent reasons that explained the various reported incidents were:-**

- Over speeding
- 'The minimum distance rule' while overtaking was not adhered to

- Drunken driving
- Overlooked installed road signage's and road safety furniture lie speed breakers, partition and kerb fittings etc.
- Inability of the driver to maintain the 'minimum sight distance' while braking
- Overloading
- Obstructive advertisement hoardings

The site details pertaining to each of the aforesaid reported incidents are presented herewith:-

It may be noted that there are 129 incidents for which descriptions are collated in the following table as against the otherwise reported 89 incidents from the previous table.

Table 1-26 : Vehicle Accident Report

Vehicle Accident Report-Part(B)																
ACCIDENT REPORTING FORM																
S.No.	SECTION	LOCATION	INJURY	DATE	TIME	CONDITION						Road Features				
						Speed Limit	Road Type	Curvature	Surface	Light	No. Of Lanes	Paint Marking	Paint	Road Features	Junction	Weather
1	S2	57+240	None	17-03-2013	3.30pm	60	2 way	-	Sealed	Bright Sun	2	-	Yes	Motorway	Driveway	Fine
2	S2	57+480	Grievously	22-03-2013	4.25pm	60	2 way	-	Sealed	Bright Sun	2	-	Yes	Motorway	Driveway	Mist.
3	S2	37+800	Minor	22-03-2013	3.15pm	60	2 way	-	Dry	Bright Sun	2	-	Yes	Motorway	Driveway	Fine
4	S2	26+100	None	22-03-2013	2.30pm	60	2 way	-	Dry	Bright Sun	2	-	74101	Flat	Driveway	Fine
5	S2	6+100	None	22-03-2013	1.09pm	60	2 way	-	Dry	Bright Sun	2	-	Yes	Flat	Driveway	Fine
6	S2	68+140	Minor	26-03-2013	11.45am	60	2 way	-	Dry	Overcast	2	-	Yes	Flat	Driveway	Strong wind
7	S2	75+320	Fatal	31-03-2013	11.00am	60	2 way	-	Sealed	Bright Sun	2	-	Yes	Bridge	Driveway	Fine
8	S2	29+180	Minor	26-06-2013	2.57pm	30	2 way	Straight	Sealed	Bright Sun	1	Center Line	-	Flat	Driveway	Fine
9	S2	53+600	Minor	06-07-2013	6.30pm	85	2 way	Moderate	Sealed	Dark	2	Center Line	-	Bridge	Driveway	Fine
10	S2	36+000(LHS)	Slightly	07-07-2013	4.30pm	85	2 way	Moderate	Sealed	Sun	2	Center Line	-	Flat	Cross	Fine
11	S2	75+630(LHS)	Worst Injury	17-07-2013	4.30pm	No Speed Limit	2 way	Easy	Sealed	Dark	2	Center Line	-	Flat	Y	Fine
12	S4	12+320(LHS)	Worst Injury	06/072013	4.30pm	100	2 way	Straight	Sealed	Sun	2	Center Line	-	Flat	Tee	Fine
13	S1	2+020	Minor	06-08-2013	9.30am	65	2 way	Moderate	Sealed	Sun	2	Passing line	-	Flat	Driveway	Fine
14	S2	45+200 (RHS)	Minor	08-08-2013	10.30am	60	2 way	Easy	Dry	Bright Sun	2	Pedestrian	-	Motorway	Cross	Fine
15	S2	56+020	Worst Injury	30-08-2013	8.30am	50	2 way	Moderate	Dry	Sun	2	Raised & Passing	-	Flat	Driveway	Fine
16	S2	61+020 (LHS)	Minor	16-08-2013	3.30pm	45	2 way	Easy	Wet	Dark	2	Painted Island	-	Flat	Driveway	Light rain
17	S2	63+620 (LHS)	Worst Injury	17-08-2013	1.00am	60	2 way	Easy	Wet	Dark	2	Center Line	-	Flat	Driveway	Light rain
18	S2	69+400	Worst Injury	06-08-2013	11.30am	100	2 way	Straight	Dry	Bright Sun	2	Pedestrian	-	Flat	Cross	Fine
19	S2	68+820 (RHS)	Worst Injury	06-08-2013			2 way	Easy	Unsealed	Bright Sun	2	Center Line	-	Flat		Light rain
20	S2	77+640 (LHS)	Worst Injury	19-08-2013	4.30am	80	2 way	Easy	Sealed	Twilight	2	Center Line	-	Motorway	Driveway	Fine
21	S2	75+460 (LHS)	Worst Injury	19-08-2013	2.30pm	70	2 way	Easy	Sealed	Bright Sun	2	Center Line	-	Flat	Cross	Fine
22	S2	73+800 (RHS)	Minor	14-08-2013	4.30pm	20	2 way	Easy	Unsealed	Bright Sun	2	Center Line	-	Flat	Driveway	Fine
23	S2	96+010 (RHS)	Minor	26-08-2013	6.00pm	35	2 way	Moderate	Dry	Twilight	2	Passing line	-	Flat	Driveway	Fine
24	S5	14+360	Worst	05-08-2013	11.00am	65	2 way	Straight	Dry	Dark	2	Painted	-	Motorway	Roundabout	Fine

		(RHS)	Injury													
25	S1	8+880 (LHS)	Minor	09-09-2013	10.30pm	45	2 way	Easy	Dry	Dark	2	Center Line	-	Motorway	Driveway	Fine
26	S2	64+800	Fatal	12-09-2013	10.30pm	55	2 way	Easy	Dry	Dark	2	Center Line	-	Motorway	Driveway	Fine
27	S2	74+350 (LHS)	Fatal	14-09-2013	1.30pm	60	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Flat	Driveway	Fine
28	S2	62+300	Minor	09-09-2013	2.30pm	65	2 way	Easy	Wet	Bright Sun	2	Center Line	-	Flat	Driveway	Fine
29	S2	73+540 (RHS)	Minor	08-09-2013	11.30am	65	2 way	Easy	Wet	Bright Sun	2	Center Line	-	Flat	Driveway	Fine
30	S2	75+100 (LHS)	Minor	06-09-2013	12.30pm	65	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Motorway	Driveway	Fine
31	S3	121+400	Minor	28-09-2013	8.30am	60	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Flat	Driveway	Fine
32	S4	8+650 (RHS)	Fatal	02-09-2013	4.00pm	50	2 way	Easy	Wet	Bright Sun	2	Center Line	-	Flat	Driveway	Fine
33	S5	17+320 (RHS)	Minor	22-09-2013	12.30pm	50	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Flat	Driveway	Fine
34	B8	21+300 (LHS)	Fatal	16-09-2013	10.30am	65	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Motorway	Driveway	Fine
35	S2	35+220 (RHS)	Minor	15-10-2013	4.30pm	55	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Flat	Driveway	Fine
36	S2	51+720 (RHS)	Minor	09-10-2013	5.00am	60	2 way	Easy	Dry	Dark	2	Center Line	-	Motorway	Driveway	Fine
37	S2	53+300 (BHS)	Minor	11-10-2013	8.30am	60	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Flat	Driveway	Fine
38	S2	53+300 (LHS)	Minor	12-10-2013	5.00pm	40	2 way	Easy	Dry	Unknown	2	Center Line	-	Motorway	Driveway	Fine
39	S2	63+100 (RHS)	Minor	20-10-2013	6.30pm	65	2 way	Easy	Dry	Twilight	2	Center Line	-	Flat	Driveway	Fine
40	S2	78+800 (LHS)	Minor	18-10-2013	12.30pm	65	2 way	Easy	Dry	Dark	2	Center Line	-	Motorway	Driveway	Fine
41	S2	83+000 (RHS)	Fatal	18-10-2013	4.00pm	60	2 way	Easy	Dry	Dark	2	Center Line	-	Flat	Driveway	Fine
42	S2	101+900 (LHS)	Minor	08-10-2013	1.00pm	60	2 way	Easy	Dry	Dark	2	Center Line	-	Motorway	Driveway	Fine
43	S2	103+350 (LHS)	Minor	01-10-2013	2.00pm	65	2 way	Easy	Dry	Unknown	2	Center Line	-	Motorway	Driveway	Fine
44	S5	18+200 (LHS)	Fatal	08-10-2013	6.30pm	50	2 way	Easy	Dry	Dark	2	Center Line	-	Flat	Driveway	Fine
45	B8	29+930 (LHS)	Minor	07-10-2013	10.00pm	65	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Motorway	Driveway	Fine
46	S2	37+200 (RHS)	Minor	20-11-2013	10.00am	60	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Flat	Driveway	Fine
47	S2	79+800	Minor	11-11-2013	5.00am	50	2 way	Easy	Dry	Dark	2	Center Line	-	Motorway	Driveway	Fine
48	S2	56+300	Minor	24-11-2013	4.00pm	60	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Motorway	Driveway	Fine
49	S2	15+400 (LHS)	Minor	12-11-2013	11.00am	60	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Motorway	Driveway	Fine
50	S2	31+400	Minor	07-11-2013	7.00pm	55	2 way	Easy	Dry	Dark	2	Center Line	-	Motorway	Driveway	Fine
51	S2	62+300	Minor	25-11-2013	8.00pm	60	2 way	Easy	Dry	Dark	2	Center Line	-	Flat	Driveway	Fine
52	S2	58+100	Minor	17-12-2013	9.00am	60	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Motorway	Driveway	Fine
53	S2	97+800	Minor	21-12-2013	3.00pm	60	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Motorway	Driveway	Fine

54	S2	9+440	Minor	22-12-2013	8.00pm	60	2 way	Easy	Dry	Bright Sun	2	Island	-	Motorway	Driveway	Fine
55	S2	33+700	Minor	23-12-2013	4.30pm	60	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Motorway	Driveway	Fine
56	S2	48+200	Minor	27-12-2013	4.00pm	50	2 way	Easy	Dry	Overcast	2	Center Line	-	Motorway	Driveway	Fine
57	S2	12+000	Minor	29-12-2013	9.30am	60	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Motorway	Driveway	Fine
58	S2	39+200	Minor	31-12-2013	4.00pm	60	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Motorway	Driveway	Fine
59	S2	62+000	Fatal	31-12-2014	9.00pm	55	2 way	Easy	Dry	Twilight	2	Center Line	-	Motorway	Driveway	Fine
60	S2	5+500	Minor	10-01-2014	5.00am	50	2 way	Easy	Dry	Dark	2	Center Line	-	Motorway	Driveway	Fine
61	S2	12+500	Minor	11-01-2014	5.00pm	50	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Motorway	Driveway	Fine
62	S2	34+400	Minor	07-01-2014	2.30pm	60	2 way	Easy	Dry	Dark	2	Center Line	-	Motorway	Driveway	Fine
63	S2	38+400	Minor	27-01-2014	6.00pm	60	2 way	Easy	Dry	Dark	2	Center Line	-	Motorway	Driveway	Fine
64	S2	40+900	Minor	25-01-2014	5.00pm	55	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Motorway	Driveway	Fine
65	S2	45+320	Minor	11-01-2014	5.00am	55	2 way	Easy	Dry	Dark	2	Center Line	-	Motorway	Driveway	Fine
66	S2	52+260	Minor	11-01-2014	9.30am	50	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Motorway	Driveway	Fine
67	S2	64+000	Worst Injury	20-01-2014	9.00pm	50	2 way	Easy	Wet	Dark	2	Center Line	-	Motorway	Driveway	Fine
68	S2	66+450	Minor	15-01-2014	9.00am	50	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Motorway	Cross	Fine
69	S2	73+200	Minor	15-01-2014	9.00am	50	2 way	Easy	Dry	Overcast	2	Center Line	-	Motorway	Driveway	Fine
70	S2	89+600	Minor	16-01-2014	5.00am	50	2 way	Easy	Dry	Dark	2	Center Line	-	Motorway	Driveway	Fine
71	S2	105+200	Minor	03-01-2014	11.30am	50	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Motorway	Driveway	Fine
72	S2	13+100	Minor	03-02-2014	7.00am	60	2 way	Easy	Dry	Twilight	2	Center Line	-	Motorway	Driveway	Fine
73	S2	103+640	Minor	04-02-2014	9.30am	50	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Motorway	Driveway	Fine
74	S2	52+820	Minor	07-02-2014	6.00am	55	2 way	Easy	Dry	Twilight	2	Center Line	-	Motorway	Driveway	Fine
75	S2	61+900	Minor	08-02-2014	4.40am	55	2 way	Easy	Dry	Dark	2	Center Line	-	Motorway	Driveway	Fine
76	S2	52+800	Minor	10-02-2014	6.00pm	60	2 way	Easy	Dry	Twilight	2	Center Line	-	Motorway	Driveway	Fine
77	S2	73+700	Minor	21-02-2014	5.00am	60	2 way	Easy	Dry	Dark	2	Center Line	-	Motorway	Driveway	Fine
78	S2	64+450	Minor	21-02-2014	4.30pm	50	2 way	Easy	Dry	Twilight	2	Center Line	-	Motorway	Driveway	Fine
79	S3	123+300	Minor	10-02-2014	7.30pm	60	2 way	Easy	Dry	Dark	2	Center Line	-	Motorway	Driveway	Fine
80	S2	15+300	Minor	25-03-2014	11.00am	40	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Motorway	Driveway	Fine
81	S2	57+600	Minor	08-03-2014	10.00am	50	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Motorway	Driveway	Fine
82	S3	23+300	Minor	03-03-2014	11.30am	45	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Motorway	Driveway	Fine
83	B8	32+400	Minor	16-03-2014	3.40am	45	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Motorway	Driveway	Fine
84	S2	17+000	Minor	08-04-2014	8.30pm	45	2 way	Easy	Dry	Dark	2	Center Line	-	Motorway	Driveway	Fine
85	S2	47+000	Minor	14-04-2014	10.00am	50	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Motorway	Driveway	Fine
86	S2	55+700	Minor	18-04-2014	8.30am	45	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Motorway	Driveway	Fine
87	S2	54+000	Minor	18-04-2014	9.30am	50	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Bridge	Driveway	Fine
88	S2	36+500	Minor	19-04-2014	10.00am	40	2 way	Moderate	Dry	Bright Sun	2	Center Line	-	Motorway	Driveway	Fine
89	S2	16+000	Minor	21-04-2014	2.40pm	50	2 way	Easy	Dry	Bright Sun	2	Nil	-	Motorway	Driveway	Fine
90	S2	60+800	Minor	21-04-2014	2.40pm	50	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Motorway	Driveway	Fine
91	S2	15+600	Minor	05-05-2014	4.10pm	50	2 way	Easy	Dry	Dark	2	Center Line	-	Motorway	Driveway	Fine
92	S2	30+100	Minor	06-05-2014	4.00am	40	2 way	Easy	Dry	Dark	2	Center Line	-	Motorway	Driveway	Fine
93	S2	73+460	Worst Injury	12-05-2014	11.00pm	60	2 way	Easy	Dry	Dark	2	Center Line	-	Bridge	Driveway	Fine
94	S2	58+600	Minor	13-05-2014	3.00pm	45	2 way	Easy	Wet	Bright Sun	2	Center Line	-	Flat	Driveway	Strong wind
95	S2	64+800	Minor	18-05-2014	9.00am	50	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Motorway	Driveway	Fine
96	S2	100+500	Worst Injury	19-05-2014	4.00am	55	2 way	Easy	Dry	Dark	2	Center Line	-	Motorway	Driveway	Fine
97	S2	37+800	Minor	20-05-2014	3.00pm	50	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Motorway	Driveway	Fine
98	S2	67+700	Minor	25-05-2014	11.00am	45	2 way	Moderate	Dry	Bright Sun	2	Center Line	-	Motorway	Driveway	Fine

99	S2	5+600	Minor	29-05-2014	12.10pm	45	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Motorway	Driveway	Fine
100	S5	12+440	Minor	18-05-2014	10.00am	50	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Motorway	Driveway	Fine
101	S2	92+300	Minor	07-06-2014	10.30am	45	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Motorway	Driveway	Fine
102	S2	54+100	Minor	06-06-2014	2.30pm	50	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Motorway	Driveway	Fine
103	S2	29+000	Minor	29-06-2014	9.45am	50	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Motorway	Driveway	Fine
104	S4	1+350	Minor	06-06-2014	6.00am	50	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Motorway	Driveway	Fine
105	S2	32+980	Grievously	16-07-2014	8.45am	50	2 way	Easy	Dry	Twilight	2	Center Line	-	Motorway	-	Fine
106	S2	25+300	Minor	20-07-2014	2.30pm	45	1 way	Easy	Dry	Sunny	4	Center Line	-	Motorway	Cross	Fine
107	S2	61+300	Minor	24-07-2014	4.00pm	50	2 way	Easy	Wet	Twilight	2	Center Line	-	Motorway	-	Light rain
108	S4	23+100	Fatal	05-07-2014	5.30pm	45	2 way	Easy	Wet	Twilight	2	Center Line	-	Motorway	-	Light rain
109	S4	6+800	Grievously	08-07-2014	3.00am	50	2 way	Easy	Dry	Dark	2	Center Line	-	Motorway	-	Fine
110	S2	43+100	Minor	09-08-2014	9.30am	45	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Motorway	-	Fine
111	S2	52+400	Minor	10-08-2014	4.00am	40	2 way	Easy	Dry	Dark	2	Center Line	-	Motorway	-	Fine
112	S2	5+010	Minor	10-08-2014	10.30am	50	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Flat	-	Fine
113	S2	21+850	Fatal	10-08-2014	4.10am	50	2 way	Easy	Dry	Dark	2	Center Line	-	Flat	-	Fine
114	S2	64+500	Fatal	11-08-2014	12.45pm	45	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Flat	-	Fine
115	S2	99+550	Major	13-08-2014	6.00pm	45	2 way	Easy	Dry	Twilight	2	Center Line	-	Flat	-	Fine
116	S2	40+550	Fatal	16-08-2014	5.30pm	40	2 way	Easy	Dry	Twilight	2	Center Line	-	Flat	-	Fine
117	S3	124+800	Minor	15-08-2014	9.30am	50	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Motorway	-	Fine
118	S2	78+810	Minor	01-09-2014	10.50pm	60	2 way	Easy	Dry	Dark	2	Center Line	-	Motorway	-	Heavy rain
119	S2	35+010	Minor	03-09-2014	11.00pm	40	2 way	Easy	Dry	Dark	2	Center Line	-	Flat	-	Fine
120	S2	54+202	Major	15-09-2014	2.30am	70	2 way	Easy	Dry	Dark	2	Center Line	-	Flat	-	Fine
121	S2	89+900	NIL	24-09-2014	1.30am	50	2 way	Easy	Dry	Dark	2	Center Line	-	Flat	-	Fine
122	S2	79+200	Fatal and Major	20-09-2014	2.00am	50	2 way	Easy	Dry	Dark	2	Center Line	-	Flat	-	Fine
123	S2	61+980	Minor	04-10-2014	3.30am	60	2 way	Easy	Dry	Dark	2	Center Line	-	Flat	-	Fine
124	S2	58+650	-	14-10-2014	2.30pm	50	2 way	Moderate	Dry	Bright Sun	2	Center Line	-	Flat	-	Fine
125	S2	49+100	-	17-10-2014	5.30am	45	2 way	Easy	Dry	Twilight	2	Center Line	-	Flat	-	Fine
126	S2	60+350	-	19-10-2014	3.30am	60	2 way	Easy	Dry	Dark	2	Center Line	-	Flat	-	Fine
127	S2	23+370	-	27-10-2014	10.30am	50	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Motorway	-	Fine
128	S2	59+260	-	27-10-2014	4.30am	60	2 way	Easy	Dry	Twilight	2	Center Line	-	Flat	-	Fine
129	S2	105+350	-	31-10-2014	9.30am	40	2 way	Easy	Dry	Bright Sun	2	Center Line	-	Flat	-	Fine

1.8.1 Scope of work for the MC

The scope of work for the MC pertaining to the Road Safety module is as follows:-

The Monitoring Consultant shall make recommendations to the Employer's Representative for the acceptance of the following detailed design outputs to be provided by the Contractor from Road Safety standpoint so as to cover:-

-All pavement rehabilitation designs
-All surfacing designs
-All final upgradation and other improvement designs identified and submitted for approval including all associated safety improvements
-Other Safety Improvement needs as identified by the Contractor and submitted to the Client for acceptance

Further, the scope entails that the Contractor upgrades and maintains the road markings, signage and shoulders on the network to consistent standards across the network, has a focus on safety – both users and his own work force – in everything he undertakes. Finally the MC has to ensure adherence to Indian Road Congress (IRC) traffic and geometric standards or similar approved standards from a safety standpoint.

The Monitoring Consultant shall carry out annual review of all of the Management Performance Measures (MPM's) Road User Comfort and Safety Performance Measures (RUC & SPM's) and Road Durability Performance Measures (RDPM's specified in the OPRC document.

1.9 MC Inspection pertaining to Road Signage Inadequacies

The MPR of October stated the various road signage inadequacies as reported and rectified by the contractor. The MC on its behest at random undertook an independent inspection on S2 and S4 and reported compliance by the Contractor as per the following table:-

Table 1-27 : Sample Inspection Report on Road Signage Improvement Work Undertaken – As per October 2014 MPR

S.No	Road Name	Location		Sign Type	Side	Length / Mtr	Nos.	Date Removed	Date Installed	Remarks
		From	To							
1	S-2	20+800	.....	Hectometer Stone Reinstallation	L/S		1		25-10-2014	Ok
2	S-2	22+000	24+000	Hectometer Stone Cleaning	L/S		12		11-10-2014	Not / Ok
3	S-2	37+000	40+000	Hectometer Stone Cleaning	L/S		7		17-10-2014	Ok
4	S-2	66+000		K.M Stone Installation	L/S		1		13-10-2014	Ok
5	S-2	82+600		Hectometer Stone Installation	L/S		1		07-10-2014	Ok
6	S-4	1+700	2+315	Thermoplastic Road Marking (Centre Line)	Cen ter	92			18-10-2014	Ok
7	S-4	6+200	8+050	Thermoplastic Road Marking (Edge Line)	R/S	1850			20-10-2014	Ok
8	S-4	13+350	15+100	Thermoplastic Road Marking (Centre Line)	Cen ter	234				Patch Work – 9X5(13+500 L/S) Patch Work(14+000L/S 5X5)
9	S-4	15+000	15+200	Thermoplastic Road Marking (Edge Line)	Edg e Line	200		28-10-2014	Patch Work	Ok
10	S-4	17+900	20+800	Thermoplastic Road Marking (Centre Line)	Cen ter	400		29-10-2014		OK
11	S-4							28-10-2014		
12	S-4	22+500	23+400	Thermoplastic Road Marking (Edge Line)	R/S	900		14-10-2014		Ok

Section wise defects w.r.t to Road Safety and Signanges as observed by the MC during its recent inspection has been reported for in the detailed inspection reports.

1.10 Environmental & Social Management Framework (ESMF)

The OPRC contract intends to achieve the following goals and objectives in a sustained manner throughout its duration vide:

- Adhering to regulatory compliance with respect to environment, health, safety and social aspects;
- Formulating and implementing a robust Environmental Management Systems in line with the recommended Environmental & Social (F&S) Management Framework as is practical within the scope of the contract;
- Positively contributing to the environmental conservation of resources and sustainable development principles;
- Mitigating and managing adverse impacts arising out of contract interventions and activities;
- Delivering sustained Environmental and Social performance by adopting continual improvement principles and global best practices as part of the contract Environmental Management Systems within the scope of the contract; and
- Improving the road safety of the assigned network by adopting Indian Road Congress (IRC) traffic and geometric standards or similar approved standards.

1.10.1 Role delineation – Monitoring Consultant and Contractor for Implementing the ESMF

The Environment & Social Management Framework (ESMF) comprises of following nine (9) elements and the responsibility for implementing the ESMF element delineated as follows:-

Contractor

Step 1: Environmental and Social Baseline Data Collection and Mapping
Step 2: Study OPRC intervention proposals for each link to identify and scope out E&S issues
Step 3: Assess Applicable Policy and Regulatory Framework
Step 4: Environmental and Social Assessment (ESA)
Step 6: Formulate Environmental Management Plan
Step 7: Implement EMP
Step 8: Self-Assess Environmental Performance

Monitoring Consultant on behalf of Client

Step 5: Stakeholder Consultation Process
Step 9: E&S Performance Assessment by Employer

1.10.2 Specific Role of the Monitoring Consultant on Behalf of the Client

- As part of this process element, the Monitoring Consultant will routinely assess Environmental & Social Performance vis-à-vis Performance Indicators defined under the contact and indicate ESMF

action responsibilities for execution, monitoring/ cross checks and approvals which include the Contractor, Monitoring Consultant, Client and others

- MC has to Evaluate and monitor the performance of Environmental Impact Management Plan and Resettlement & Rehabilitation Plan by the Contractor on a perpetual basis;
- The Monitoring Consultant will ensure proper implementation of environment impact mitigation measures relevant to the Contract proposed by the Contractor;
- The Monitoring Consultant shall undertake random reviews (at a frequency not exceeding 12 months) of Contractor's Environmental Management Plan, including any annual updates, to ensure that these plans are attuned to the contract's deliverables and report deviations, if any;
- **Assist the client with Environmental and Social Compliance Report vide a periodic submission.**

1.10.3 ESMF Report as Submitted by the Contractor for the month of October,2014

The MC team post mobilisation in the month of October 2014, was handed over the various ESMF reports prepared by the Contractor till date. **The present section discusses some of the preliminary observations and non- compliances based upon their recent submission:-**

I. Refer section 10.1 Executive Summary – **Monitoring report** – Sample analysis of air, water and noise level have not been provided for;

II. Refer section 10.2**statutory clearances** – **Camp 1: KhialaKhrud Camp**
Permission for withdrawal of ground water for construction- it is unclear as to when it will be obtained from Central Ground Water Board (they were applied for during the last year)

III. **Camp 2:**The report is silent about the status of permission for withdrawal of Ground water construction

IV. **Other clearances (Refer Page no.133) Table 1:** Sand Mining and Quarry for aggregator – **MC query** -Has there any agreement been entered into with the owner of existing quarry site?

V. **Canal water permission** –shall expire this month; haste application for renewal submitted?**MC query**

VI. **Table 2. Forest clearances , Stretch S2- MC query** – What is the current status of tree cutting permission from the Forest Dept of Sangrur (18.300 km – 45.700 km), Mansa (45.700 km – 67.800 km and 79.000- 82.000 km) and Bathinda (82.000-107.770 km)?

VII. **Table 8 – Details of Environmental Enhancement works –MC query-** Mentions only about the pond in S5, what about the other works?

VIII. Refer Page 150- Summary sheet of Environments reports – Sl No.11 – The report does not mention about the number of trees cut and number of trees earmarked for cutting.

1.10.4 Specific Approach to be adopted by the Monitoring Consultant on Behalf of the Client

(1) Sub Module A

The MC shall collate and review submissions and reports meted out as part of Package 1 and articulate the gaps that exist given the requirements of Guidelines of World Bank and MOEF such as:

- Environmental policy, Acts including legal and administrative framework of the
- State Government and Government of India,
- Environmental Guidelines for Rail/Road/Highway Project (MoEF, 1989)
- OP/BP/GP 4.01 Environmental Assessment
- OP/BP/GP 4.02 Environmental Action Plan
- OP/BP/GB 4.04 Natural Habitats
- OP/BP 4.12 Involuntary Resettlement
- OD 4.20 Indigenous People
- OPN 4.03 Cultural Property
- BP 17.50 Disclosure of Operational Information
- Environmental Assessment Sourcebook Update (World Bank)
- Roads and Environment: A handbook (World Bank Technical Paper No. 376)
- Requirements of the World Bank
- Consultation with environmental authorities including SPCB/CPCB/MoEF,

(2) Sub Module B

The review of Environmental and social reports shall include analysis, verification and consideration of recommendation of various reports prepared **by the contractor** in terms of identification of potential impacts and mitigating the identified negative impacts. The accuracy and verification of data will be carried out by conducting reconnaissance survey, public consultation, and discussion with stakeholders and experts;

(3) Sub Module C

The consultant will review whether major environmental issues in respect of pre-construction, construction and operation of the project have been assessed. Each parameter of the environment will be assessed according to its relative importance and its impact. The matrix method will be used for evaluation and assessment of the associated impacts. The applicability and suitability of the mitigation measures will also be reviewed and all the suggestions will be forwarded to the contractor through client for necessary modification;

(4) Sub Module D

The Monitoring Consultant will also propose to the client to organize meetings with various experts from the Contractor's side, so that they understand the various ESMF compliances

(5) Sub Module E

The EMP will be designed suggesting relevant mitigation and monitoring measures for construction and operation phase. Suitable measures will be suggested to mitigate the adverse impact on flora & fauna, land, drainage, soil and to provide road safety. Compensatory measures shall be suggested for unavoidable activities required for the project like tree felling, acquisition of land etc. If adverse social impacts are identified, mitigating measures will be included in Joint ESMP (Environmental and Social Management Plan)

(6) Sub Module F

The capability of project implementation authority particularly at local and regional level will be reviewed to ensure that the proposed management and monitoring plan of the ESMP would be properly implemented. The sectorial arrangement, management procedures and training, staffing budget and financial support will be assessed. Institutional strengthening and monitoring framework will be suggested as required.

(7) Sub Module G

Undertake Social Assessment as part of EMP

The Social Impact Assessment study as a part of Environmental Assessment and EMP will be carried out by collection of primary and secondary data of social attributes from relevant sources. The SIA will assess and determine the magnitude and sensitivity of direct and indirect socio-economic impacts likely to be occurred on the community due to implementation of the project, facilitate integration of social considerations in the project design and recommend cost effective mitigation measures. This study will be conducted in conformance to the applicable guidelines/policies and relevant statutory requirements of concerned department, Govt. of Punjab and the Funding Agency; i.e World Bank.

QC Tests and Reporting

The Contractor as part of the MPR is supposed to undertake and report quality test results based upon Request of Inspection and Request for Survey at their instance. Such inspections and the results thereof were so far being ratified by the Client (Monitoring Consultant from now on). **The following table summarizes the QC tasks undertaken and reported by the Contractor pertaining to the month of October, 2014**

The MC has suggested to the contractor that they would intimate them at least 48 hrs prior of such Request for Inspection or Request for Survey work being undertaken onsite. This would ensure MC's availability for the slated inspections.

Table 1-28 : **QC tasks undertaken & reported by the Contractor pertaining to the month of October, 2014**

S.N.	Location	Material	Type of Test	Date	Result
1	35+900 to 36+600 R/S-Top, B8	BC(Gr-1)	Core Density Test	1/10/14	99%
2	35+900 to 36+600 R/S-Top, B8	BC(Gr-1)	Aggregate Impact Value(IS-2386-part-1)	1/10/14	15.8%
3	35+900 to 36+600 R/S-Top, B8	BC(Gr-1)	Flakiness Index and Elongation Index(IS-2386 part-1)	1/10/14	27.74%
4	35+900 to 36+600 R/S-Top, B8	BC(Gr-1)	Bitumen Extraction & Graduation	1/10/14	5.05%
5	35+900 to 36+600 R/S-Top, B8	BC(Gr-1)	Bitumen Extraction & Graduation	1/10/14	5.1%
6	35+900 to 36+600 R/S-Top, B8	BC(Gr-2)	Sieve Analysis for Dry Mix Aggregate	1/10/14	NA
7	35+900 to 36+600 R/S-Top, B8	BC(Gr-1)	Bituminous concrete by Marshall Method	1/10/14	5.05%
8	35+900 to 36+600 R/S-Top, B8	Tack coat	Rate of spread of tack coat(Tray test)	1/10/14	2.8 kg/10m2
9	35+740 to 36+470 L/S-Top, B8	BC(Gr-1)	Core Density Test(ASTM-D-2726)	2/10/14	99.5%
10	35+740 to 36+470 L/S-Top, B8	BC(Gr-1)	Aggregate Impact Value(IS-2386-part 1)	2/10/14	15.95%
11	35+740 to 36+470 L/S-Top, B8	BC(Gr-1)	Flakiness Index and Elongation Index(IS-2386 part-1)	2/10/14	27.22%
12	35+740 to 36+470 L/S-Top, B8	BC(Gr-1)	Bitumen Extraction & Graduation	2/10/14	5.09%
13	35+740 to 36+470 L/S-Top, B8	BC(Gr-1)	Bitumen Extraction & Graduation	2/10/14	5.11%
14	35+740 to 36+470 L/S-Top, B8	BC(Gr-1)	Sieve Analysis for Dry Mix Aggregate	2/10/14	NA
15	35+740 to 36+470 L/S-Top, B8	BC(Gr-1)	Bituminous concrete by Marshall Method	2/10/14	5.1%
16	35+740 to 36+470 L/S-Top, B8	Tack coat	Rate of spread of tack coat(Tray test)	2/10/14	2.33 kg/10m2
17	35+360 to 35+900 L/S-Top, B8	BC(Gr-1)	Core Density Test(ASTM-D-2726)	3/10/14	99.85%
18	35+360 to 35+900 L/S-Top, B8	BC(Gr-1)	Aggregate Impact Value(IS-2386-part 1)	3/10/14	15.51%
19	35+360 to 35+900 L/S-Top, B8	BC(Gr-1)	Flakiness Index and Elongation Index(IS-2386 part-1)	3/10/14	27.83%
20	35+360 to 35+900 L/S-Top, B8	BC(Gr-1)	Bitumen Extraction & Graduation	3/10/14	5.07%

21	35+360 to 35+900 L/S-Top, B8	BC(Gr-2)	Sieve Analysis for Dry Mix Aggregate	3/10/14	NA
22	35+360 to 35+900 L/S-Top, B8	BC(Gr-2)	Sieve Analysis for Dry Mix Aggregate	3/10/14	NA
23	35+360 to 35+900 L/S-Top, B8	BC(Gr-1)	Bituminous concrete by Marshall Method	3/10/14	5.04%
24	35+360 to 35+900 L/S-Top, B8	Tack coat	Rate of spread of tack coat(Tray test)	3/10/14	2.25 kg/10m2
25	34+850 to 35+740 L/S-Top, B8	BC(Gr-1)	Core Density Test(ASTM-D-2726)	4/10/14	99.79%
26	34+850 to 35+740 L/S-Top, B8	BC(Gr-1)	Aggregate Impact Value(IS-2386-part 1)	4/10/14	15.73%
27	34+850 to 35+740 L/S-Top, B8	BC(Gr-1)	Flakiness Index and Elongation Index(IS-2386 part-1)	4/10/14	28.16%
28	34+850 to 35+740 L/S-Top, B8	BC(Gr-1)	Bitumen Extraction & Graduation	4/10/14	5.08%
29	34+850 to 35+740 L/S-Top, B8	BC(Gr-1)	Bitumen Extraction & Graduation	4/10/14	5.05%
30	34+850 to 35+740 L/S-Top, B8	BC(Gr-2)	Sieve Analysis for Dry Mix Aggregate	4/10/14	NA
31	34+850 to 35+740 L/S-Top, B8	BC(Gr-2)	Sieve Analysis for Dry Mix Aggregate	4/10/14	NA
32	34+850 to 35+740 L/S-Top, B8	BC(Gr-1)	Bituminous concrete by Marshall Method	4/10/14	5.06%
33	34+850 to 35+740 L/S-Top, B8	Tack coat	Rate of spread of tack coat(Tray test)	4/10/14	2.33 kg/10m2
34	34+620 to 35+360 L/S-Top, B8	BC(Gr-1)	Core Density Test(ASTM-D-2726)	8/10/14	99.5%
35	34+620 to 35+360 L/S-Top, B8	BC(Gr-1)	Aggregate Impact Value(IS-2386-part 1)	8/10/14	16.57%
36	34+620 to 35+360 L/S-Top, B8	BC(Gr-1)	Flakiness Index and Elongation Index(IS-2386 part-1)	8/10/14	28.27%
37	34+620 to 35+360 L/S-Top, B8	BC(Gr-1)	Bitumen Extraction & Graduation	8/10/14	5.12%
38	34+620 to 35+360 L/S-Top, B8	BC(Gr-2)	Sieve Analysis for Dry Mix Aggregate	8/10/14	NA
39	34+620 to 35+360 L/S-Top, B8	BC(Gr-1)	Bitumen Extraction & Graduation	8/10/14	5.18%
40	34+620 to 35+360 L/S-Top, B8	BC(Gr-2)	Sieve Analysis for Dry Mix Aggregate	8/10/14	NA
41	34+620 to 35+360 L/S-Top, B8	BC(Gr-1)	Bituminous concrete by Marshall Method	8/10/14	5.3%
42	34+620 to 35+360 L/S-Top, B8	Tack coat	Rate of spread of tack coat(Tray test)	8/10/14	2.41 kg/10m2

43	32+110 to 34+620 R/S-Top, B8	BC(Gr-1)	Core Density Test(ASTM-D-2726)	9/10/14	98.7%
44	32+110 to 34+620 R/S-Top, B8	BC(Gr-1)	Bituminous concrete by Marshall Method	9/10/14	5.08%
45	32+110 to 34+620 R/S-Top, B8	BC(Gr-1)	Bituminous concrete by Marshall Method	9/10/14	5.07%
44	32+110 to 34+620 R/S-Top, B8	BC(Gr-1)	Aggregate Impact Value(IS-2386-part 1)	9/10/14	15.77%
45	32+110 to 34+620 R/S-Top, B8	BC(Gr-1)	Flakiness Index and Elongation Index(IS-2386 part-1)	9/10/14	28%
46	32+110 to 34+620 R/S-Top, B8	BC(Gr-1)	Bitumen Extraction & Graduation	9/10/14	5.11%
47	32+110 to 34+620 R/S-Top, B8	BC(Gr-1)	Aggregate Impact Value(IS-2386-part 1)	9/10/14	15.49%
47	32+110 to 34+620 R/S-Top, B8	BC(Gr-1)	Aggregate Impact Value(IS-2386-part 1)	9/10/14	16.59%
48	32+110 to 34+620 R/S-Top, B8	BC(Gr-1)	Flakiness Index and Elongation Index(IS-2386 part-1)	9/10/14	27.59%
49	32+110 to 34+620 R/S-Top, B8	BC(Gr-1)	Flakiness Index and Elongation Index(IS-2386 part-1)	9/10/14	26.75%
50	32+110 to 34+620 R/S-Top, B8	BC(Gr-1)	Bitumen Extraction & Graduation	9/10/14	5.05%
51	32+110 to 34+620 R/S-Top, B8	BC(Gr-1)	Bitumen Extraction & Graduation	9/10/14	5.1%
52	32+110 to 34+620 R/S-Top, B8	BC(Gr-1)	Bitumen Extraction & Graduation	9/10/14	5.05%
53	32+110 to 34+620 R/S-Top, B8	BC(Gr-1)	Sieve Analysis for Dry Mix Aggregate	9/10/14	NA
54	32+110 to 34+620 R/S-Top, B8	BC(Gr-1)	Sieve Analysis for Dry Mix Aggregate	9/10/14	NA
55	32+110 to 34+620 R/S-Top, B8	BC(Gr-1)	Rate of spread of tack coat(Tray test)	9/10/14	2.45 kg/m2
56	32+400to34+850 LS –Top,B8	BC(Gr-1)	Core Density Test(ASTM-D-2726)	10/10/14	99.76
57	32+400to34+850 LS –Top,B8	BC(Gr-1)	Bituminous concrete by Marshall Method	10/10/14	5.15%
58	32+400to34+850 LS –Top,B8	BC(Gr-1)	Bituminous concrete by Marshall Method	10/10/14	5.13%
59	32+400to34+850 LS –Top,B8	BC(Gr-1)	Bituminous concrete by Marshall Method	10/10/14	5.15%
60	32+400to34+850 LS –Top,B8	BC(Gr-1)	Bitumen Extraction & Graduation	10/10/14	5.15%

61	32+400to34+850 LS –Top,B8	BC(Gr-1)	Aggregate Impact Value(IS-2386-part 1)	10/10/14	15.56%
62	32+400to34+850 LS –Top,B8	BC(Gr-1)	Aggregate Impact Value(IS-2386-part 1)	10/10/14	15.55%
63	32+400to34+850 LS –Top,B8	BC(Gr-1)	Flakiness Index and Elongation Index(IS-2386 part-1)	10/10/14	27.58
64	32+400to34+850 LS –Top,B8	BC(Gr-1)	Flakiness Index and Elongation Index(IS-2386 part-1)	10/10/14	28
65	32+400to34+850 LS –Top,B8	BC(Gr-1)	Bitumen Extraction & Graduation	10/10/14	5.13%
66	32+400to34+820 LS –Top,B8	BC(Gr-1)	Bitumen Extraction & Graduation	10/10/14	5.14%
67	32+400to34+820 LS –Top,B8	BC(Gr-1)	Bitumen Extraction & Graduation	10/10/14	5.15%
68	32+400to34+820 LS –Top,B8	BC(Gr-1)	Bitumen Extraction & Graduation	10/10/14	5.16%
69	32+400to34+850 LS –Top,B8	BC(Gr-1)	Sieve Analysis for Dry Mix Aggregate	10/10/14	NA
70	32+400to34+850 LS –Top,B8	BC(Gr-1)	Sieve Analysis for Dry Mix Aggregate	10/10/14	NA
71	32+400to34+850 LS –Top,B8	BC(Gr-1)	Rate of spread of tack coat(Tray test)	10/10/14	2.29 kg/m2
72	29+580 to32+110 RS-Top,B8	BC(Gr-1)	Core Density Test(ASTM-D-2726)	11/10/2014	99.7%
73	29+580 to32+110 RS-Top,B8	BC(Gr-1)	Bituminous concrete by Marshall Method	11/10/2014	5.08
74	29+580 to32+110 RS-Top,B8	BC(Gr-1)	Bituminous concrete by Marshall Method	11/10/2014	5.11
75	29+580 to32+110 RS-Top,B8	BC(Gr-1)	Bituminous concrete by Marshall Method	11/10/2014	5.16
76	29+580 to32+110 RS-Top,B8	BC(Gr-1)	Aggregate Impact Value(IS-2386-part 1)	11/10/14	15.41%
77	29+580 to32+110 RS-Top,B8	BC(Gr-1)	Flakiness Index and Elongation Index(IS-2386 part-1)	11/10/14	27.76%
78	29+580 to32+110 RS-Top,B8	BC(Gr-1)	Bitumen Extraction & Graduation	11/10/14	5.16%
77	29+580 to32+110 RS-Top,B8	BC(Gr-1)	Aggregate Impact Value(IS-2386-part 1)	11/10/14	16.32%
78	29+580 to32+110 RS-Top,B8	BC(Gr-1)	Aggregate Impact Value(IS-2386-part 1)	11/10/14	16.59%

77	29+580 to32+110 RS-Top,B8	BC(Gr-1)	Flakiness Index and Elongation Index(IS-2386 part-1)	11/10/14	27.83%
78	29+580 to32+110 RS-Top,B8	BC(Gr-1)	Flakiness Index and Elongation Index(IS-2386 part-1)	11/10/14	26.59%
79	29+580 to32+110 RS-Top,B8	BC(Gr-1)	Bitumen Extraction & Graduation	11/10/14	5.07%
80	29+580 to32+110 RS-Top,B8	BC(Gr-1)	Bitumen Extraction & Graduation	11/10/14	5.1%
81	29+580 to32+110 RS-Top,B8	BC(Gr-1)	Bitumen Extraction & Graduation	11/10/14	5.15%
81	29+580 to32+110 RS-Top,B8	BC(Gr-1)	Bitumen Extraction & Graduation	11/10/14	5.07%
82	29+580 to32+110 RS-Top,B8	BC(Gr-1)	Sieve Analysis for Dry Mix Aggregate	11/10/14	NA
83	29+580 to32+110 RS-Top,B8	BC(Gr-1)	Sieve Analysis for Dry Mix Aggregate	11/10/14	NA
84	29+580 to32+110 RS-Top,B8	BC(Gr-1)	Rate of spread of tack coat(Tray test)	11/10/14	2.84 kg/m2
85	29+850to32+400 LS-Top,B8	BC(Gr-1)	Core Density Test(ASTM-D-2726)	12/10/2014	99.1%
86	29+850to32+400 LS-Top,B8	BC(Gr-1)	Bituminous concrete by Marshall Method	12/10/2014	5.14
87	29+850to32+400 LS-Top,B8	BC(Gr-1)	Bituminous concrete by Marshall Method	12/10/2014	5.12
88	29+850to32+400 LS-Top,B8	BC(Gr-1)	Bituminous concrete by Marshall Method	12/10/2014	5.2
89	29+850to32+400 LS-Top,B8	BC(Gr-1)	Aggregate Impact Value(IS-2386-part 1)	12/10/14	16.72%
90	29+850to32+400 LS-Top,B8	BC(Gr-1)	Aggregate Impact Value(IS-2386-part 1)	12/10/14	16.51%
91	29+850to32+400 LS-Top,B8	BC(Gr-1)	Flakiness Index and Elongation Index(IS-2386 part-1)	12/10/14	27.42%
92	29+850to32+400 LS-Top,B8	BC(Gr-1)	Flakiness Index and Elongation Index(IS-2386 part-1)	12/10/14	26.89%
93	29+850to32+400 LS-Top,B8	BC(Gr-1)	Bitumen Extraction & Graduation	12/10/14	5.15%
94	29+850to32+400 LS-Top,B8	BC(Gr-1)	Bitumen Extraction & Graduation	12/10/14	5.16%
95	29+850to32+400 LS-Top,B8	BC(Gr-1)	Bitumen Extraction & Graduation	12/10/14	5.13%
96	29+850to32+400 LS-Top,B8	BC(Gr-1)	Bitumen Extraction & Graduation	12/10/14	5.2%

97	29+850to32+400 LS-Top,B8	BC(Gr-1)	Sieve Analysis for Dry Mix Aggregate	12/10/14	NA
98	29+850to32+400 LS-Top,B8	BC(Gr-1)	Sieve Analysis for Dry Mix Aggregate	12/10/14	NA
99	29+850to32+400 LS-Top,B8	BC(Gr-1)	Rate of spread of tack coat(Tray test)	12/10/14	2.84 kg/m2

The Contractors' QC Report as per MPR October 2014 is given in Appendix.

1.11 Summary of claims, disputes and open issues

So far the Monitoring Consultant has been briefed with regards to two different claims of which one is still open. While the first claim by the Contractor pertained to the payment of price escalation as per the Contract Provisions, the second one, which has been referred to the Dispute Resolution Bard (DRB), concerns the conflict that arose between the Contractor and the Client (PRBDB) in interpretation of contractual provisions w.r.t the pavement design requirements.

Claim1

The Core issue pertained to payment of Price Escalation to the Contractor as per contractual provisions, as contained in clause 48.1 of GCC and as further detailed in PCC of the contractor.

The DRB meted out the following recommendations:-

a. The recommendation of the DRB in the light of discussions and findings brought out in Para 4 above, by majority of its members (Mr. R.P. Indoria and Mr. H.P. Jamdar) are given below.
b. The DRB has concluded that the claimant is entitled to receive price adjustment payment on the basis of the formula under clause 48.1 of Particular Condition (PV).
c. The DRB therefore recommenders as under:

(1) Price adjustment amount recovered from IPC-1 by the Respondent should be released to the Claimant;
(2) Price Adjustment payment based on the agreed formula provided under clause 48.1 of PC should be paid to the Claimant for the entire duration of the Contract;
(3) Respondent should pay the claimant the outstanding amount on account of price adjustment payment along with interest specified in clause 50.1 GC of the Contract, for the period of delay;

The MC was appointed only in October 2014 and was informed of the DRB's decision w.r.t Claim1. The MC has not pursued the slated claim or wish to respond any further.

Claim2

The Monitoring pursued the Claim document in question and reviewed the related correspondences in wake of the Agreement as entered between the client and Patel Infrastructure Pvt. Limited.

The following facts need to be taken cognizance of in this regard:-

Considerations

1. Clause 5.5 discusses the series of pavement construction profile for each loading group that are to provide bidder with a basis for their lump sum price for the minimum acceptable design solution for the rehabilitated pavements within the contract area as per conventional pavement design. However, it further specifies that the contractor must still make his own assessment of the pavement design requirements based upon their intended approach to pavement construction, the range in material properties and any other applicable site specific conditions when determining their detailed design on each section. Further, it states that the bidders shall ensure that where asphaltic cement overlay treatment is proposed over any existing bituminous surfacing that is already cracked that the thickness of this new surfacing layer shall be greater than 175mm to mitigate the risk of reflective cracking covered under Clause 5.5

2. The contractor has adopted the non - conventional technology based upon Falling Weight Deflectometer (FWD) methodology as per clause 5.8.1 wherein it is mentioned that all designs and material specifications shall conform to the requirements of relevant IRC specification and the MORT&H specification for Roads and Bridges Works (Latest Edition), unless otherwise agreed with the Employer/ Project Manager.
   Pursuant to the aforesaid clause, the contractor vide its letter No. PIPL/OPRC/114/2013 dated 18-05-2013 that detailed the suggested unconventional profile and design was finally approved by the employer and Contractor was allowed to by carry out the milling of the affected cracked layer up to the depth of 25mm to avoid the reflective cracking and the same was approved by the employer subject to the Clause 8.3 of section Vl specifications of contract works and the same was adopted in rehabilitation of the affected existing sections as per Clauses 5.4, 5.6, 5.7.1, 5.8.1, 5.9 and 5.12 of section Vl of specifications and contract works Clause 8.4.2 of General condition (GC) and Clause 8.4.1 of Particular condition (PC).

Statement of Dispute

1. The Contractor is bound to execute the work as per conventional minimum acceptable design solution for their lump sum price for the rehabilitated pavement within the contract area under Clause 5.5;

2. The Contractor although entitled to execute the work as per its own non - conventional pavement design as long as the said design meets the minimum design criteria mentioned in Clause 5.5 and Clause 5.8 of the contract;
3. The Contractor's work is standstill because the contractor is not adopting the methodology of minimum design solution as per requirements under Clause 5.5 and Clause 5.8 for not using the method of overlaying asphaltic cement over the existing bituminous surface;
4. The Employer claims that the Contractor's contention is completely unjust and is not in accordance with the contract and is, therefore, liable to be rejected;
5. The Employer is not permitting the contractor to proceed with the work unless the contractor agrees to execute the work as per minimum design solution provided under Clause 5.5.

The MC has pursued the available details of Claim2 and made it available during the meetings of the DRB (as observers). The MC has independently communicated its opinion to PRBDB on the aforesaid slated claim.

Chapter 2 Data and Reports at MC's Disposal and Listing of Data Gaps

The Monitoring Consultant has pursued various documents since inception in October 2014. The following table discuss the availability of data including missing data files as on date:-

Table 2-1: Files Received till Date

Output & Performance Based Road Contract (OPRC) (Asset Management Contract) For Improvement, Rehabilitation, Resurfacing &Routine Maintenance Works Of Road Of Sangrur - Mansa - Bathinda Contract Area			
FILES DETAILS-RECEIVED FROM PWD -SANGRUR			
S.No.	**File Name**	**MC Remarks/ Comment**	**Receiving Date**
1	Proposal For NOC From Widlife Divison	Soft copy required	16-10-2014
2	Regulatory Clearances Matrix	Soft copy required	16-10-2014
3	Inventory Data Base Management	Soft copy required	16-10-2014
4	Contract Quality Assurance Management Plan	Soft copy required	16-10-2014
5	Interim Payment Certificate - June & July	Soft copy required	16-10-2014
6	Traffic Survey Report - June 2013	Soft copy required	16-10-2014
7	Traffic Survey Report - June 2014	Soft copy required	16-10-2014
8	Traffic Survey Data Collection Sheet Bhatinda to Talwandi	Soft copy required	16-10-2014
9	Inventory Report	Scanned copy in CD Available- Excel/MS Word/ PDF missing	16-10-2014
10	Pavement Design Report- B8 April 2014	Scanned copy in CD Available- Excel/MS Word/ PDF missing	16-10-2014
11	Pavement Design Report- S2 May 2014	Scanned copy in CD Available- Excel/MS Word/ PDF missing	16-10-2014
12	Pavement Design Report- S5 May 2014	Scanned copy in CD Available- Excel/MS Word/ PDF missing	16-10-2014
13	Pavement Design Report- S1 ….	Hard Copy Missing	
14	Monthly Progress Report Mar- 2013	Scanned copy in CD Available- Excel/MS Word/ PDF version missing	30-10-2014
15	Monthly Progress Report June- 2013		30-10-2014
16	Monthly Progress Report July- 2013		30-10-2014
17	Monthly Progress Report Aug- 2013		30-10-2014
18	Monthly Progress Report Sep- 2013		30-10-2014
19	Monthly Progress Report Oct- 2013		30-10-2014
20	Monthly Progress Report Nov- 2013		30-10-2014
21	Monthly Progress Report Dec- 2013		30-10-2014
22	Monthly Progress Report Jan- 2014		30-10-2014
23	Monthly Progress Report Feb- 2014		30-10-2014

24	Monthly Progress Report Mar-2014		30-10-2014
25	Monthly Progress Report Apr- 2014		30-10-2014
26	Monthly Progress Report May- 2014		30-10-2014
27	Monthly Progress Report June- 2014		30-10-2014
28	Monthly Progress Report July- 2014		16-10-2014
29	Monthly Progress Report Aug- 2014		16-10-2014
30	Monthly Progress Report Sep- 2014		21-10-2014
31	Monthly Progress Report Oct-2014		20-11-2014
32	Monthly Progress Report Oct-2014 (XEROX)		20-11-2014
33	Monthly Progress Report Oct-2014 (COPY)		20-11-2014
34	As Built Drawing Of Bhwanigarh-Sunam-Kotshmir(s2) Road From KM 68+000 TO 79+000	Soft copy missing	30-10-2014
35	As Built Drawing Of Bhwanigarh-Sunam-Kotshmir(s2) Road From KM 73+050 TO 79+000	Soft copy missing	30-10-2014
36	As Built Drawing Of Bhwanigarh-Sunam-Kotshmir(s2) Road From KM 9+400 TO 18+150	Soft copy missing	30-10-2014
37	As Built Drawing Of Bhwanigarh-Sunam-Kotshmir(s2) Road From KM 2+240 TO 8+4000 & 9+400 TO 18+150	Soft copy missing	30-10-2014
38	Environmental Management Plan Sangrur-Sunam(S1) Road		14-11-2014
39	Environmental Management Plan Sangrur-Sunam(S1) Road	AVAILABLE	14-11-2014
40	Environmental Management Plan Barnala-Mansa(S3) Road		14-11-2014
41	Environmental Management Plan Barnala-Mansa(S3) Road	AVAILABLE	14-11-2014
42	Environmental Management Plan Dhanaula-Bhikhi(S5) Road		14-11-2014
43	Environmental Management Plan Dhanaula-Bhikhi(S5) Road	AVAILABLE	14-11-2014
44	Environmental Management Plan Bathinda-Talwandi Sabo(B8)		14-11-2014
45	Environmental Management Plan Bathinda-Talwandi Sabo(B8)	AVAILABLE	14-11-2014
46	Environmental Impact Assessment Report S2:Bhawanigarh-Sunam-Bhikhi-SH13 Intersection-Kotshamir(SH 12 A) July 2013	Soft copy missing	30-10-2014

47	Environmental Impact Assessment Report S4: Mansa-Talwand Sabo (up to intersection with B8:ODR9) July 2013	Soft copy missing	30-10-2014
48	ROAD & WORKPLACE SAETY, HIV-AIDS AWARENESS, ENVIRONMENT & SANITATION	Soft copy missing	30-10-2014
49	Claim No.1 -- Dispute Package No PSRSP/WB/OPRC/1/ICB	Soft copy missing	30-10-2014
50	Road Section No.S2 (SH-12 : Bhwanigarh-Sunam-Kotsahmir) Highway Drawings (Oct-2013) From KM 32+000 TO 61+800	Soft copy missing	30-10-2014
51	Road Section No.S2 (SH-12 : Bhwanigarh-Sunam-Kotsahmir) Highway Drawings (Oct-2013) From KM 32+000 TO 61+800	AVAILABLE	30-10-2014
52	Road Section No.S2 (SH-12 : Bhwanigarh-Sunam-Kotsahmir) Highway Drawings (May-2013) From KM 2+270 TO 22+240 & 61+790 TO 82+150	Soft copy require	30-10-2014
53	Road Section No.S2 (SH-12 : Bhwanigarh-Sunam-Kotsahmir) Highway Drawings (Oct-2013) From KM 61+880 TO 68+060	Soft copy require	30-10-2014
54	Road Section No.S4 (OPR9 : Mansa-Talwandi Sabo Intersection B8) Highway Drawings (Sep- 2013) From KM 0+000 TO 24+970	Soft copy require	30-10-2014
55	Road Section No.S4 (OPR9 : Mansa-Talwandi Sabo Intersection B8) Highway Drawings (Sep- 2013) From KM 0+000 TO 24+970	Extra copy	30-10-2014
56	Road Section No.S4 (OPR9 : Mansa-Talwandi Sabo Intersection B8) Highway Drawings (Sep- 2013) From KM 0+000 TO 24+970	Soft copy missing	30-10-2014
57	Road Section No.S1 (MDR-21 30/11/2014: Sangrur-Sunam) Highway Drawings (Oct-2013) From KM 0+000 TO 11+300	Soft copy missing	30-10-2014
58	Road Section No.S1 (MDR-21 30/11/2014: Sangrur-Sunam) Highway Drawings (July-2013) From KM 0+000 TO 11+300 Strip Plan	Soft copy missing	30-10-2014
59	Typical Cross Sections in Auto Cad Format	Scanned copy in CD-Excel/MS Word/ PDF missing	20-11-2014
60	Project Layout Plan in Auto Cad Format		20-11-2014

61	Coordinates in Excel Format		20-11-2014
62	Topography Survey Data		20-11-2014

Table 2-2: Other Documents Available

Sl. No.	FILE NAME		
1	Claim No.2 -- Minimum Design Solution	ORIGINAL	
2	Claim No.2 -- Minimum Design Solution	XEROX AVAILABLE	
3	Selection Of Consultant	XEROX AVAILABLE	
4	OPRC Contract Report - Part 1 (PSRP)	XEROX AVAILABLE	
5	OPRC Contract Report - Part 1 (PSRP)	AVAILABLE	

Further, the MC has communicated to the Contractor and need to pass on the following set of information without any further delay:-

1. Conformance Management System
2. Conformance Monitoring System
3. All works program and modifications and justification
4. Report of the IRI of the sectors done
5. Report of the Falling Weight Deflectometer
6. Conformance of the control unit
7. Design of pavements of the sectors: S5 soft copy, B8 soft copy, S1 hard copy, S3 and S4 soft copy and hard copy
8. Criteria for installation of the signs
9. Environmental Management Plan – Soft copy of all sector
10. Report of pavements
11. S2 From Km 2+000 to 22+000 Topography (CAD File)
12. S2 From Km 19+000 to 109+000 Center Line Coordinates
13. S3 Center Line Coordinate & Typical Cross Section
14. S4 Topography Data with Excel and CAD File
15. S5 Center Line Coordinates & Topography Data
16. B8 Center Line Coordinates Bathinda to Kotshamir& Typical Cross Section
17. Detail of all Sections F.R.L, O.G.L Existing road (Excel Format)
18. All Detail Of Structure (Slab Culvert, Pipe Culvert with Diameter & Widening Width in Excel Format)
19. R.D Remarks Should be on Inside Parapet wall (Structure) or Chainage Pillar
20. List by Borrow Area (Subgrade Soil) with approved documents.
21. Coordinates Detail of all Bridges (Bridge, Minor Bridge & Major Bridge, R.O.B)
22. Bar bending Schedule (B.B.S) of all pipe culvert & Slab Culvert.
23. R.F.I for Daily summary report (Request for inspection).

Chapter 3 Project Staffing, Role Delineation and Module Specific Proposed Approach

This chapter presents the description of the organization and staffing in accordance with the Terms of Reference and the methodology proposed to ensure the quality of the consultancy services and within the specified time.

During the services the MC's key professional staff team will spend much of their time on this assignment in field with necessary technical and engineering support from the head office of the firm.

The organization presented reflects the commitment of the firm to achieve optimal results in assisting the Punjab Public Works Department, Building & Roads, PWD (B&R). The organization setup proposed below reflects the expectations of the Client, the knowledge of the situation and desired outcomes and the time frame for the delivery of outputs.

In accordance with the requirements of the Client, the work will be organized to reflect the various inter-relations between the various bodies, which are involved in the project:

- The Client – Punjab Public Works Department, Building & Roads, PWD (B&R).
- Other agencies or Government institutions.
- Financing Agency – International Development Association (IDA).
- Team Leader of the Consultant.
- The Consultant Professional Team.
- Other support staff.

In Figure 3-1, the organization of the project is presented in detail. At the top, appears the Client, which will supply the Consultant with all available documents relevant to the project. Also, the Client will make introductions to facilitate liaison with other Ministries/Departments to enable the Consultant to have access to all relevant documentation related with the assignment.

Next in the figure, the Team Leader of the Consultancy Project appears; he will be in charge of the whole assignment and coordinate the other team members. The Team Leader will be the responsible of guarantee that the Consultant staff contribute actively to the learning process of Government staff and the personnel of local contractors and consultants which may be involved in the execution of the project.

Beneath the Team Leader, other key MC´s professionals appear. The Principal Auditor and the OPRC Specialist will support the Team Leader in several tasks, and mainly on monitoring CE´s level of performance and providing technical assistance. The Pavement Engineer/Management Specialist will be principally responsible for the review of pavement designs. The Data Analyst will be responsible for evaluation and recommendation of a database management system and support the Client during its implementation. The Environmentalist/Sociologist will be responsible for ensure the proper implementation of the environmental and social measures. The expert professional staff will be always coordinated and guided by the Team Leader

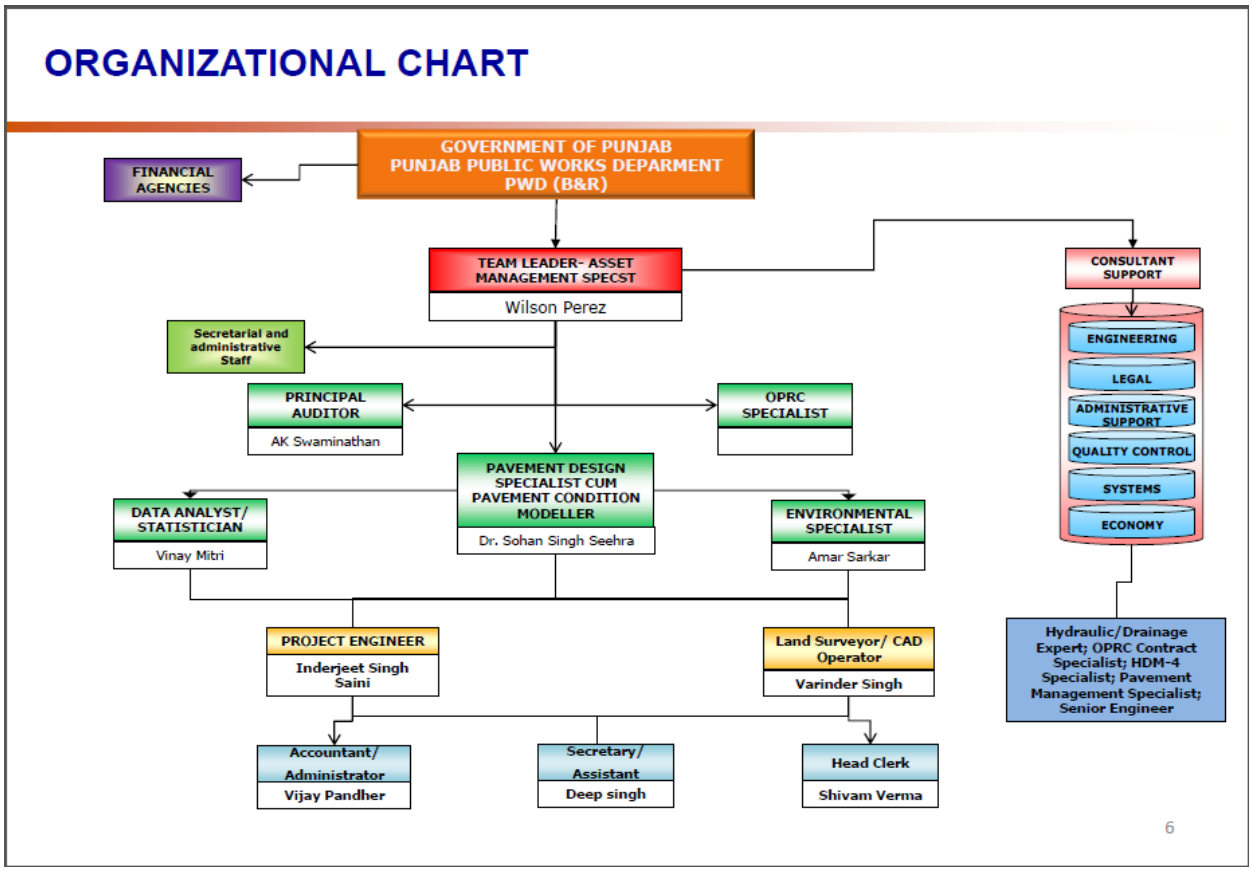


Figure 3-1 : Project Organization Chart

The Quality Assurance Specialist for each package will be principally responsible for monitoring the implementation of CQAMP and verification of QC/QA. The Environmentalist/Sociologist will be responsible for ensure the proper implementation of the environmental and social measures in both packages. The Bridge Engineer will be responsible for the review of the structures designs and the corresponding construction monitoring/supervision. The Hydraulics and Drainage Specialist will be responsible for the hydraulics and drainage design review and supervision/monitoring. The Soils/Materials Engineer will be responsible for the QC/QA during laboratory tests. Finally, the Contract Specialist will be responsible of claims (extension of time, variations, fluctuations, etc) advising the Client properly. The expert professional staff will be always coordinated and guided by the Team Leader.

The key professionals will be supported by Financial Specialist responsible of financial modelling, the assistant materials engineer who will provide assistance to the Soils/Materials Engineer, Safety Officer, and Expert in Data processing and Assistant/CAD Operator as required and they will also have the support of other professionals of the companies, which are specialize in several areas. The Consultant will maintain close liaison with a Project Counterpart to be designated by RD.

Team Composition and Task Assignments

The objective is to provide as many experienced professionals as required to complete the work within the time specified in the TOR without compromising the standard of quality of service offered or the project deliverables produced. The team proposed by the Consultant is multi-disciplinary with a long experience in their area of expertise.

For the services,Table 3-1 presents the Team Composition and Task Assignments for key staff, in which the tasks assigned to the professional staff, are presented.

Table 3-1: Team Composition and Task Assignments for key staff

EVALUATED KEY STAFF	
Position Assigned	**Task Assigned**
Team Leader/ Project Manager	Team Leader and overall responsible of project management. In charge of coordination of professional and support staff, and for the verification of the fulfilment of the Consultant's contractual obligations. Other main tasks assigned: • Assist the contractor in the relocation/protection/diversions of utility services and removal of encroachments • Verification and agreement to the Work Plan • Monitoring of preliminary works/services • Approval of CE´s levels of performance during Rehabilitation and Maintenance for recommendation to the Client • Provide technical assistance • Physical and financial progress control • Work Plan Control • Review and check periodic payments reports and implementation verification reports • Preparation of Reports • Quality Control of the works • Environmental and Social Control • Assistance during Maintenance stage • Evaluation and recommendation of a database management system and support the Client during its implementation • Assistance during the collection and revision of the basic line data of the Project • Training
Highway Engineer	• Coordination and review of survey of existing utility services and encroachments • Review of Topographical control of preliminary works and during the rehabilitation and Maintenance. Preparation of related reports. • Physical progress control • Inspection, review, and/or measure levels of service • In coordination with Team leader, in charge of Periodic Inspection to meet the level of service • Inspection of implementation of Quality Assurance Manual, Traffic Management Plan, and Work Plan in field. • Review of compliance with the design specifications in field. • Preparation of reports • Assistance in the relocation/protection/diversions of utility services and removal of encroachments • Monitoring CE´s levels of performance during Rehabilitation and Maintenance stages • Technical assistance and training in field. ▪ Inspection of Quality Control in field

	▪ Review and check periodic payments reports and implementation verification reports ▪ Review and approve a detailed inventory and reconcile tem with the As-built drawings ▪ Evaluation and recommendation of a database management system and support the Client during its implementation.
Pavement Engineer/ Management Specialist	• Review CE´s Quality Assurance Manual, Traffic Management Plan, and Work Plan. • Review and issue recommendations on CE´s pavement designs • Preparation of reports • Monitoring CE´s levels of performance related with the pavement during Rehabilitation and Maintenance Stages • Technical assistance and quality control • Review and check periodic payments reports and implementation verification reports • Training • Evaluation and recommendation of a database management system and support the Client during its implementation from the pavement point of view • Assistance during the collection and revision of the basic line data of the Project
Environmental Specialist	• Lead the consultancy in environmental, resettlement and socio-economic tasks. Preparation of related reports. • Assistance with the review of the CE´s Quality Assurance Manual, and the Health & Safety Management Plan • Ensure proper implementation of the environmental mitigation measures • Ensure proper implementation of the policies related with resettlement matters
Quality Assurance (QA) Engineer	• Review of CE‟s Contract Quality Assurance Management Plan (CQAMP), Health and Safety Management Plan, Emergency procedures and incident response plan and its implementation • Quality assurance testing necessary to verify that quality control standards are being achieved • Inspection and measurement all level of service achieved • Notify the CE in case of any detection and inspect after the time allowed for repairs or tolerance permitted for each criterion during Maintenance Stage. • After notification and re-inspection will confirm if the LOS has been met, or if non-compliance payment reductions have to be applied according to the methodology established for this purpose • Quality Control reports on the works completed during the month clearly indicating any non-conformance
Bridge Design Engineer/ Structural Engineer	• Review and issue recommendations on the structures designs • Assistance with the review of CE´s Quality Assurance Manual and Work Plan • Structures monitoring during the rehabilitation and maintenance stages. • Technical assistance and preparation of reports • Ensure complete compatibility with contractor´s structures working

	drawings
Hydraulics and Drainage Specialist	• Assistance with the review of the CE´s Quality Assurance Manual, and the hydraulic studies and drainage designs • Preparation of related reports • Inspection, review, and/or measure levels of service related with hydraulic structures • Works and materials control • Technical assistance during rehabilitation/improvement and routine maintenance works. • Ensure complete compatibility with contractor´s drainage structures working drawings
Soils/ Materials Engineer	• Assistance with the review of the CE´s Quality Assurance Manual and designs. • Monitor preliminary works • Inspection, review, and/or measure levels of service • Review compliance of service level criteria • Technical assistance on materials testing during the rehabilitation works and preparation of Reports as well as assistance during maintenance stage • In charge of the quality control, including materials information checking, control and approve method statements and material sources
Contract Engineer	• Recommending approvals for the CE‟s insurances; • Clarifying any queries on the Contract Data; • Responding to requests for contract changes as made by either the CE or the Client; • Assessing quotations provided by the CE for carrying out variations and instructing variations after approval by the Client; • Assist the Client in resolving any claim or dispute as the result of the civil works contract and to make recommendations thereon, including possible recourse to the Disputes Resolution Board (DRB).

	Task Assigned	Team Leader	Principal Auditor	OPRC Spec.	Pavement Spec.	Data Analyst	Environmentalist
1	Assist the contractor in the relocation/protection/diversions of utility services and removal of encroachments	✓	✓				
2	Verification and agreement of the Work Plan	✓		✓			
3	Monitoring of preliminary works / services	✓	✓				
4	Monitoring CE's levels of performance during Rehabilitation and Maintenance for recommendation to the Client	✓	✓	✓	✓		
5	Review and issue recommendations on CE's designs		✓	✓	✓		
6	Provide technical assistance	✓	✓	✓	✓	✓	
7	Physical and financial progress control	✓	✓				
8	Review and check periodic payments reports and implementation verification reports	✓	✓				
9	Preparation of Reports	✓	✓	✓	✓		
10	Inspection of implementation of Quality Assurance Manual, Traffic Management Plan, and Work Plan in field. Quality Control of the works	✓	✓	✓	✓		
11	Environmental, resettlement and socio – economic tasks. Preparation of related reports. Ensure proper implementation of environmental, resettlement mitigation measures						✓
12	Assistance during the Defects Liability Period	✓	✓				
13	Evaluation and recommendation of a database management system and support the Client during its implementation	✓	✓	✓		✓	
14	Assistance during the collection and revision of the basic line data of the Project	✓		✓	✓	✓	
15	Ensure complete compatibility contractor's working drawings		✓	✓		✓	
16	Periodic Inspection to meet the level of service		✓	✓			
17	Training	✓	✓		✓		

Chapter 4 Proposed work plan and MC' Deliverables

This chapter presents the description of the work plan in accordance with the Terms of Reference and the methodology proposed to ensure the successful development of the project. Experienced professional staff will be assigned to develop the project. The Consultant will develop the tasks included in the Work Schedule according to the above presented methodologies.

The proposed Work Plan will accomplish the objectives of the consultancy and tasks as described in detail in the previous sections.

The services of the MC shall entail due-diligence towards the following set of activities:-

- Rehabilitation Works
- Improvement Works
- Network Performance Measures
- Resurfacing Works
- Emergency Works

.Next are summarised the main tasks to be carried out during the Consultancy Services

4.1 Fulfilling the Role of Project Manager (Part A)

The following tasks have been considered

- Mobilization and Design Period
- Review de CE´s Work Program
- Meetings
- Review and approve a detailed inventory and the as-built drawings
- Develop with CE contingency plans
- Assistance in the relocation/protection/diversions of utility services and removal of encroachments
- Preparation and submission of the Inception Report
- Preparation and submission of the Design Review Report
- Review Periodic Payment Reports (quarterly)
- General Supervision
- Quality Control
- Topographical Control
- Environmental and Social Control

4.2 Conformance Monitoring and Management (Part B)

This task will cover the following activities:

- Audit of the Contractor's Contract Quality Assurance Management Plan (CQAMP)
    - Review the CQAMP
    - Review the Health & Safety Management Plan

  - Review the Traffic Management Plan
  - Review the Environmental and Social Management Plan
- Audit of the Contractor's Performance
  - Monthly Audit
  - Independent Audit
  - Monthly Progress Report
  - Traffic Management
- Inspections
  - Commencement of Contract Inspections
  - Monthly Inspections
  - Combined Inspections
  - Inspections at the End of the Contract
  - Emergency Works Inspections
- Reporting
  - Monthly Report
  - Combined Drive over daytime and night-time Report
  - Hand-Over Report
  - Network Condition Report
  - End of Contract Handover report
- Contractors Performance Monitoring and Surveillance
  - Review for Contractor's Performance, Inspections and Tests
  - Payment Certificate
  - Price Adjustment
- Review and Recommendation of Contractor's Designs
  - Modification
  - Records
- Environmental & Social Management Framework
- Monitoring Service levels

4.3 Network Condition Monitoring and Pavement Condition Monitoring (Part C)

This task will cover the following activities:

- Development and Review of the Network's 10 year forward work programme (FWP)
  - Development of the Network's10 year FWP
  - Review of the Network's10 year FWP
- Review of the Network Condition Service Levels and Performance Measures specified in the OPRC Document
- Assistance in Managing the annual programme of Data Collection of Pavement Durability Measures

4.4 Network Information and Data Analysis (Part D)

This task will cover the following activities:

- Desk-top Review of the Client's Existing Database
- Periodic Review of Currently available Data
- Support the Client during the implementation of the DMS

4.5 Additional Client Support by way of training of Client's staff

The MC will contribute actively to the learning process of Government staff and the personnel of Contracting Entities in the use of database system, document management system and all parameters included in the OPRC Project in Punjab.