

GOVERNMENT OF INDIA AND GOVERNMENT OF PUNJAB

PUNJAB ROADS & BRIDGES DEVELOPMENT BOARD



## MONTHLY PROGRESS REPORT No 3 (DECEMBER - JANUARY 2015)

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



**TNM** TECHNOLOGY AND  
MANAGEMENT LTD.



**TNM – ICRA Management Consulting Services Ltd**  
Monitoring Consultant – Project Office  
Construction Division – PWD B&R  
D.A.C Block – 2  
Sangrur, Punjab - 148001

## ABBREVIATIONS

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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

Col – 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](http://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 Axle

ESMF-Environmental Social Management Framework

FIDIC - Federation International 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

Gol - 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

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 SadakYojana  
 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](http://www.devbusiness.com))  
 WB – World Bank

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# 1 PROJECT OVERVIEW

## 1.1 INTRODUCTION BACKGROUND

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 INFRASTRUCTURE 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 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.

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). The initial term of the Monitoring Consultancy services will be for a period of five (5) years.

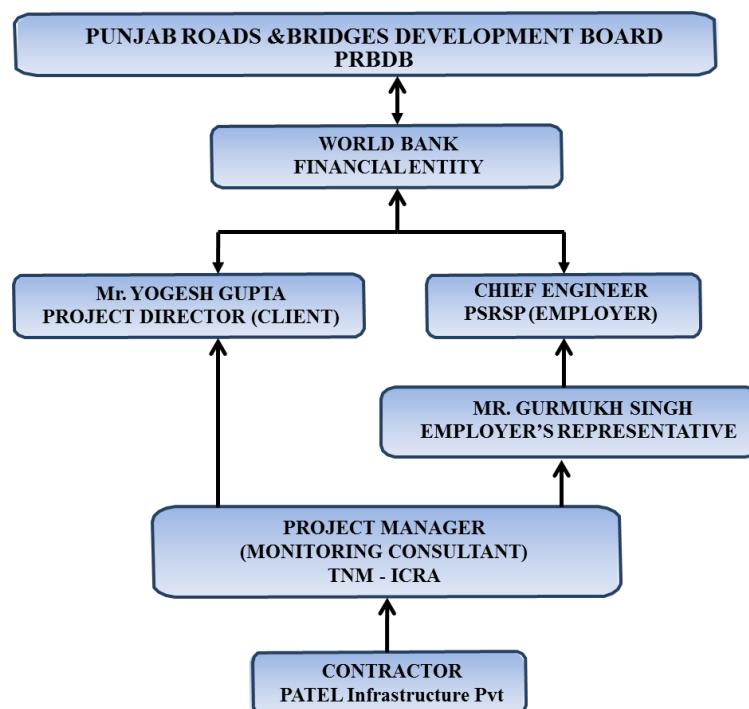


Figure 1-1 : Project Organization Chart



ENTITIES INVOLVED IN THE PROJECT		
<b>CLIENT</b>	PUNJAB STATE ROAD SECTOR PROJECT PUNJAB ROADS AND BRIDGES DEVELOPMENT BOARD – PRBDB	Yogesh Gupta - Project Director Anil Kumar Sharma – Deputy Project Director
<b>EMPLOYER'S REPRESENTATIVE</b>	PUNJAB STATE ROAD SECTOR PROJECT - SANGRUR	Mr. Gurmukh Singh - Executive Engineer Mr. Pawan Kumar Garg - Sub Divisional Engineer
<b>FUNDING AGENCY</b>	INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT (IBRD)	
<b>MONITORING CONSULTANT</b>	TNM Technology and Management Limited, - ICRA Management Consulting Services Ltd	Haim Bonjack - Authorized Signatory Wilson Perez – Team Leader
	DATE MOBILIZED ON	October 7, 2014
	Duration of Contract	5 years
<b>CONTRACTOR</b>	PATEL INFRAESTRUCURE PVT. LTD	Shri Arvindbhai V. Patel – Managing Director Mukesh Kumar – Road Manager
	Duration	10 Years
	Start Date	December 4, 2012
	Date of Signing of Contract	December 10, 2012
	End Date	December 4, 2022
	Value of contract signed	INR 596.36 Crs

Figure 1-2 : Entities Involved in the Project

## 1.2 ORGANISATION CHART OF CONTRACTOR

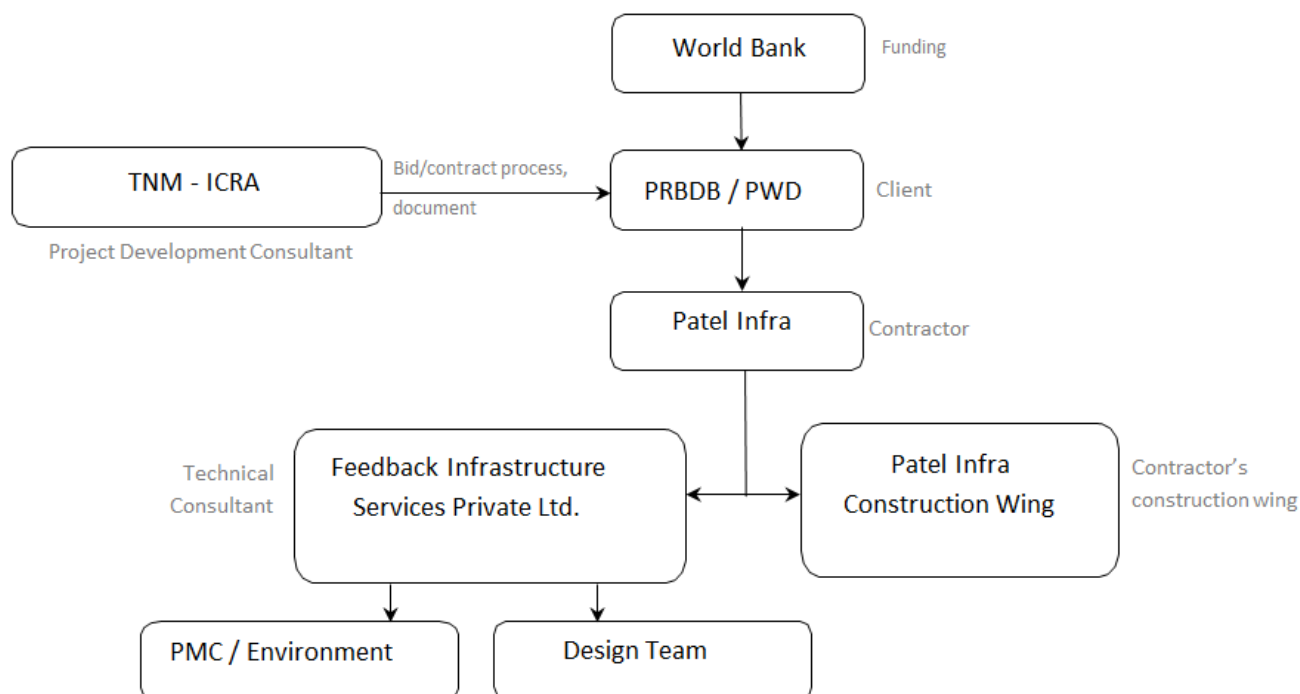


Figure 1-3 : Institutional Organization Chart of Contractor

### 1.3 ORGANISATION & TASK ALLOCATION OF 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 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.

#### 1.3.1 RESPONSIBILITIES OF THE MONITORING CONSULTANT

**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.

### 1.3.2 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.

InTable 1-1 : Participation of Members of the Monitoring Consultant in the Activities.

### 1.3.3 PROJECT ORGANIZATION

In Figure 1-4 : Organization Chart, is observing the internal distribution of all members of the staff of the Monitoring Consultant and then relationship with the Client and Contractor.

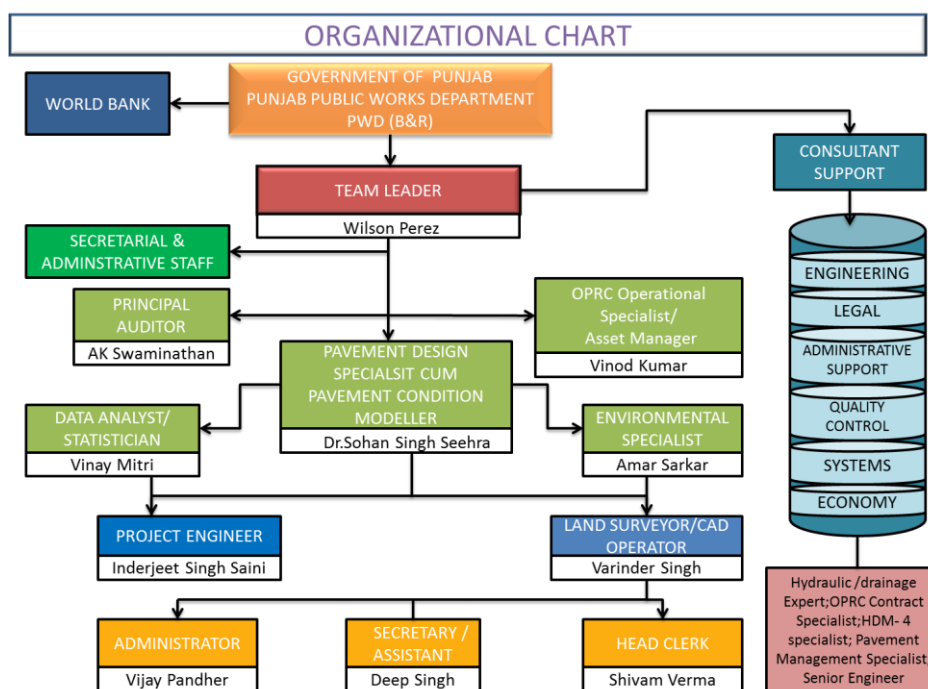


Figure 1-4 : Organization Chart of Monitoring Consultant

Table 1-1 : Participation of Members of the Monitoring Consultant in the Activities

	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	✓	✓		✓		

## 1.4 BASIC CONTRACT FEATURES

### 1.4.1 PROJECT BRIEF

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

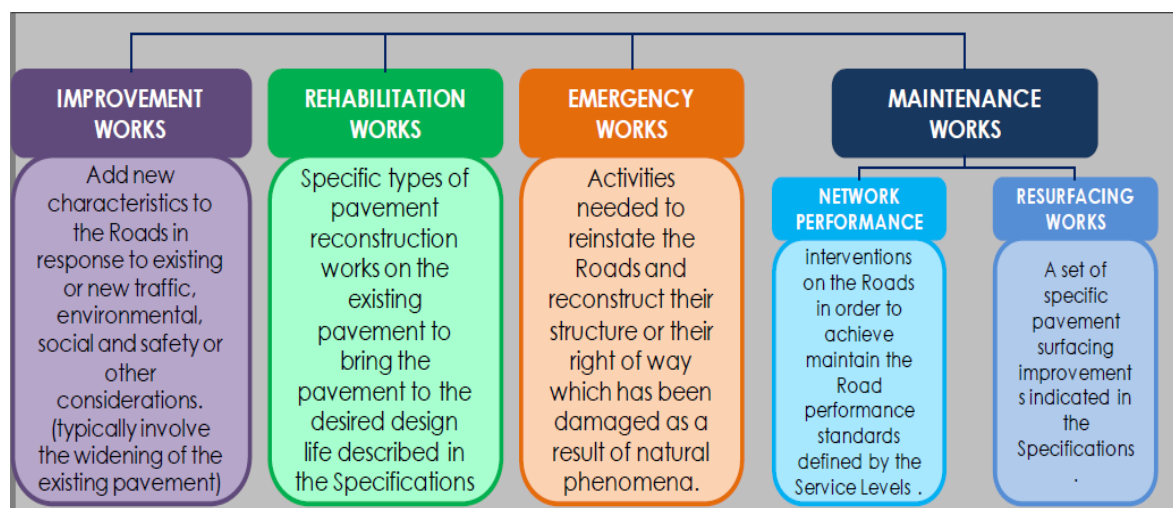


Figure 1-5 : Major components civil Works OPRC Contract for Packages 1 and 2

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
			<b>203.68</b>	

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. It is included program work as per both contract and approved by the employer that is in force.

Table 1-3 : Work Schedule to be undertaken by the Contractor

YEAR	IMPROVEMENT		REHABILITATION		RESURFACING	
	As per Contract	As per Approved	As per Contract	As per Approved	As per Contract	As per Approved
1	27.20	27.20	0.00	25.34	34.20	0.00
2	47.60	60.81	7.29	17.10	0.00	22.85
3	54.10	40.87	0.00	9.49	0.00	
4	0.00		25.34		11.30	
5	0.00		5.05		23.60	
6	0.00		2.20		10.20	
7	0.00		34.90		0.00	58.36
8	0.00		0.00		56.00	60.81
9	0.00		0.00	22.85	68.30	61.66
10	0.00		0.00		0.00	
<b>Contract Total</b>	<b>128.90</b>	<b>128.88</b>	<b>74.78</b>	<b>74.78</b>	<b>203.60</b>	<b>203.68</b>



## 2 REVIEW AND COMMENTS OF PROGRESS WORKS.

### 2.1 PROGRESS WORK VS PROGRAM WORK - TWO FIRST YEARS (BEFORE MC).

According with the review that we carried out during first two month of the contract of monitoring consultant, on this subchapter is includes a summary of the works carried out for the contractor and the comparison with the program work approved by the Client during two first years.

In this subchapter also it is include reasons of force majeure, which doesn't allow the compliance of the work program and the implications that this situation can to cause regarding to consumption of asset over the duration of the contract.

In the below table is summary the work program for the first three years and the work program for the remaining time (7 years). Further it can see the achieved progress at the end both of the first year and of the second year.

Table 2-1 : Program work first three years, ten years and achieved progress

YEAR	IMPROVEMENT			REHABILITATION			RESURFACING		
	As per Contract	As per Approved	Achieved	As per Contract	As per Approved	Achieved	As per Contract	As per Approved	Achieved
1	27.20	27.20	25.92	0.00	25.34	25.34	34.20	0.00	0.00
2	47.60	60.81	24.50	7.29	17.10	5.80	0.00	22.85	22.85
3	54.10	40.87		0.00	9.49		0.00		
4	0.00			25.34			11.30		
5	0.00			5.05			23.60		
6	0.00			2.20			10.20		
7	0.00			34.90			0.00	58.36	
8	0.00			0.00			56.00	60.81	
9	0.00			0.00	22.85		68.30	61.66	
10	0.00			0.00			0.00		
Contract Total	128.90	128.88	74.78	74.78	74.78	31.14	203.60	203.68	22.85

#### 2.1.1 PROGRESS WORK - FIRST YEAR

According to the documents provided by the contractor, we can deduct 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, to exception of the section located between K9 and K10, for a total of 25.92 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).

#### 2.1.2 PROGRESS WORK - SECOND YEAR

Regarding above table and according to the program of works approved by the client for the second year, we can see that the improvement works has a length of 60.81 km, which the contractor should build until December, 4 of 2014.

But the contractor has only built 24.50 km of improvement works that corresponding to Section S4 and has not initiated works on Sector 2 between km 32 + 000 and Km 67 + 840 having a length of 35.84 km, due to the suspension of works issued by the Forest Department. Therefore the program of improvement works could not be completed due to situations of force majeure.

Also In above table and according to the program of works approved by the client for the second year, we can see that the rehabilitation works has a length of 17.1 km, which the contractor should build until December, 4 of 2014.

But the contractor has only built 5.80 km of rehabilitation works that corresponding to Section B8 between Km 9+200 and Km 15+000. Regarding the Section S1, the contractor has built partially three kilometres between km 8 + 000 and Km 11 + 300, in which lack the last layer of pavement (BC), whereby it is not included in the table.

The contractor suspended the rehabilitation work in the Section S1 due to current dispute "DRB (Dispute Review Board)", surrounding approved pavement design.

Therefore the program of rehabilitation works could not be completed due to situations of force majeure (DRB).

Regarding of the above considerations, it was analysed the annual program of the contractor and are concluded the contractor has completed the works of the second year of activities, according the work program approved from the employer, for the two first years. Finally at this time the contractor works in the planning and reprogramming of the works since the third year.

### **2.1.3 COMMENTS PROGRESS WORK – FIRST TWO YEARS**

In this moment the project can't has a fixed program work, because there are case of force majeure that do not allow the planning of the work for the third year.

The cases of force majeure that the employer don't has resolved are the payment to Forest Department corresponding to works in the Section No 2 and the Dispute Review Board DRB regarding pavement design corresponding to works in the Section No 1.

This implies the delay of works, the consumption of assets during the contract period and uncertainty regarding the planning and execution of the third year of work.

Therefore the Contractor only can begin works in the Section No 3, which has pending the approving of the changes and the budget, required from the employer.

The Monitoring Consultant recommends to Client resolve the pending issues as soon as possible for avoid major consumption of the assets during the validity of the contract.

## **2.2 KEY DATA FROM CONTRACTOR'S MONTHLY REPORT**

This Sub Chapter summarizes the aspects different included in the Contractor's Monthly Report to December of 2014 according to contract requirements. Therefore this chapter includes: the Key Staff, the critical equipment, the summary of the progress works and the report environmental.

## 2.2.1 KEY STAFF

Table 2-2 : Contractor's Key Staff on Monthly Report

<b>Contractor Organization Chart</b>			
<b>S.N #.</b>	<b>Position</b>		<b>Name of Person</b>
1	Road Manager	1	Mukesh Kumar
2	Road Asset Manager/Risk Manager	1	Vijay Kumar
3	Senior Site Engineer	1	Upendra Kumar Thakur
4	Site Engineer (Construction)	2	Satyendra Kumar
			Vinit Kumar
5	Site Engineer (Maintenance)	2	Pankaj Kumar
			Rakesh Kumar
6	Material Engineer	1	Sanjay Pandey
7	Contract Financial Manager	1	Praveen Kahar
8	Plant & Equipment Engineer	1	R K singh
9	Store Manager	1	Bhagwaan Jha
10	Technical Staff	15	
11	Non Technical Staff	25	
12	Conformance Management Unit	1	
	Team Leader	1	S.S.Sidhu
	Field Engineer-Section-I	1	Pankaj Kumar
	Field Engineer-Section-II	1	Rakesh Kumar
	Sr. Environmentalist	1	P.K. Roy
	Jr. Environmentalist	1	Ram Singh
	Jr. Environmentalist	1	Navneet Kumar

## 2.2.2 EQUIPMENT DETAIL

Table 2-3 : Contractor's Equipment on Monthly Report

List of Construction Equipment				
S No	Equipment Type	Min Capacity	Nos.	Remarks
1	Falling Weight Deflectometer (FWD)	250 KN	1	
2	Hot Mix Plant (Batch Type Apollo)	128 TPH	1	
3	Hot Mix Plant (Batch Type Linnhoff)	200 TPH	1	
4	WMM Mixing Plant (Mackmax)	250 TPH	1	
5	Sensor Paver (Bituminous Works)	600 TPH	3	
6	Hydraulic Excavators	0.9-1.0 cum.	2	
7	Motor Grader	120 cum/hr	4	
8	Loader	1.6-1.7 & 2.4 cum.	4	
9	JCB Backhoe Loader	.3 & 1.2 cum	2	
10	Paver Mechanical	200 TPH	1	
11	Contract Patrol and response vehicles		2	
12	Contract general Inspection Vehicles		18	
13	Tandem Rollers		5	
14	Vibratory Rollers, Soil Compactor	8-10 T	3	
15	Pneumatic Tyre Roller	15 MT	1	
16	Tipper / trucks	14-24 cum.	28	
17	Water Tanker	12000 L	4	
18	Pavement marking plant	-	-	
19	Mini Bitumen Pressure Distributor		2	
20	Bitumen Pressure distributor	4-6 MT	3	
21	DG Set	456 KVA	1	
22	DG Set	320KVA	1	
23	DG Set	40KVA	1	
24	DG Set	125KVA	1	
25	DG Set	500 KVA	1	
26	DG Set	82.5 KVA	1	
27	Tractor/Trolley		6	
28	Trailer		1	
29	Power broomer	-	2	
30	Milling Machine		1	
31	Self Loading Transit Mixer	2 cum.	1	
32	Static Roller		2	
33	Tower Light	9 M	4	
34	Diesel Tanker	4000L ,8000L	2	
35	Air Compressor	100 CFM	3	

## 2.2.3 PROGRESS WORK IN IMPROVEMENT REHABILITATION AND RESURFACING

The Contractor didn't carry out works of Improvement, Rehabilitation and Resurfacing on the December Month, because he finished the works corresponding to 2th year in November month (with some exceptions explained forward) and further the Contractor plans to restart works in the February Month according with the Program Work of the third year.

## 2.2.4 NETWORK PERFORMANCE- NON-CONFORMANCE SCORE

Table 2-4 : ACCUMULATED DURING THE CONTRACT - NON – CONFORMES

Month	S1	S2	S3	S4	S5	B8	MPM	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-13	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-14	1	13	1	1	3	2	-	21
nov-14	7	20	0	13	1	17	-	58
Dec- 2014	16	43	5	11	26	35	8	145
Total – 2014	7	93	4	18	19	34	8	378
Total	19	183	5	59	34	68	8	571

Table 2-5 : SUMMARY - NON – CONFORMES – DECEMBER 2014

<b>NAME OF WORK : Output Performance Based Road Contract(OPRC) for Improvement , Rehabilitation, Resurfacing and Routine Maintenance Works of Sangrur-Mansa-Bathinda</b>			
Date: 01-01-15			
Period of Payment: 01/12/2014 to 31/12/2014			
Summary of Network Performance System of December -2014			
S. No	Item Description	Scores	Remarks
1	Total Management Performance Non-Conformance Score (MPM'S)	16	
2	Total Road Durability Non-Conformance Score (RDPM'S)	0	
3	Total Road User Safety & Comfort Non-Conformance Score (RUS&CPM'S)	129	
Total Score of Non-Conformance		145	

**Table 2-6 : MANAGEMENT PERFORMANCE MEASURES (MPM'S) - DECEMBER 2014**

<b>MANAGEMENT PERFORMANCE MEASURES (MPM'S) - REFER TO WEIGHTINGS IN THE SPECIFICATION</b>						
<b>Date: 01-01-15</b>						
<b>Period of Payment: 01/12/2014 to 31/12/2014</b>						
Reference to Bidding Document Section VI	Item Description	Performance Measure Compliance	Number of Non-Conformances Recorded A	Non-Conformance Weighting B	Sub-Weighting Days/Weeks/Months of Recorded Non Conformance C	Total Non-Conformance Score AxBxC
MPM 1	Quality Assurance System	Non Conformance due IRI data not submitted submission of Environmental Management Plan (EMP) Environmental Screeninn 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
MPM 2	Quality Assurance System	Non Conformance due FWD data not submitted to Submission of Environmental Management Plan (EMP) Environmental Screeninn 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
MPM 2	Contractor's Programs	No Non-Conformance for submission of Contractor's Programme for 2nd year. (Last date of submission is 04-11-2013.) (Contractor's Programme Submitted on 27-11-13.)	0	1	Each day of delay	0
MPM 3	Contractor's Reports	No Non-Conformance for submission of Contractor's Reports (Contractor's all reports submitted on time)	0	2	Each day of non receipt after deadline	0
MPM 4	Traffic Management	No Non-Conformance for submission of Traffic Management Plan (TMP) (Submission of Initial TMP atleast 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	0
MPM 5	Inventory Database Management	No Non-Conformance for submission of Inventory Database Management (IDM) (IDM Report Submitted.) (IDM Report Submitted on 11-01-13.)	0	2	Each week of delay	0
MPM 6	Detailed Design (A)	No Non-Conformance for Detailed Design (Detail Design submitted.) work programme 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 programme.) 1st year Design Submitted on 29- 05-2013.	0	4	Each week of delay	0
MPM 6	Construction Methodology (B)	No Non-Conformance for Construction Methodology (Construction Methodology submitted.) (Submission of CM within 2 weeks after acceptance of the annual programme.) Construction Methodology Submitted 12-12-2013	0	4	Each week of delay	0
Any MPM	Repeated Non-Conformance	No MPM repeat during the month	0	4	Number of Months Since non-conformance first identified.(1)	0
<b>Total Management Performance Non-Conformance Score</b>						<b>16</b>

**Table 2-7 : ROAD DURABILITY PERFORMANCE MEASURES (RDPM'S) - DECEMBER 2014**

<b>ROAD DURABILITY PERFORMANCE MEASURES (RDPM'S) - REFER TO WEIGHTINGS IN THE SPECIFICATION</b>						
<b>Date: 01-01-15</b>						
<b>Period of Payment: 01/12/2014 to 31/12/2014</b>						
Reference to Bidding Document Section VI	Item Description	Number of Non-Conformances Recorded A	Non-Conformance Weighting B	Sub-Weighting Days/Weeks/Months of Recorded Non Conformance C	Total Non-Conformance Score AxBxC	Comments
RDPM2	Pavement Roughness	0	5		0	No Non-Conformance recorded during the month
RDPM3	Pavement 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
<b>Total Road Durability Non-Conformance Score</b>					<b>0</b>	



Table 2-8 : ROAD USER SERVICE AND COMFORT PERFORMANCE MEASURES – S1 – S2 - DECEMBER 2014

NAME OF WORK : Output Performance Based Road Contract(OPRC) for Improvement , Rehabilitation, Resurfacing and Routine Maintenance Works of Sangrur-Mansa-Bathinda				
Section	Chainage From                      To		Audit Length in (Kms)	Audit Score of December -14 Assesment-1
Name of Road :- Sangrur-Sunam (S1)				
S111	0.000	5.000	5.000	
S112	5.000	11.300	6.300	14
Total Length of S1 Road in Kms				

Table 2-9 : ROAD USER SERVICE AND COMFORT PERFORMANCE MEASURES – S3, S4, S5, B8 - DEC 2014

NAME OF WORK : Output Performance Based Road Contract(OPRC) for Improvement , Rehabilitation, Resurfacing and Routine Maintenance Works of Sangrur-Mansa-Bathinda				
Section	Chainage From                      To		Audit Length in (Kms)	Audit Score of December -14 Assesment-1
Name of Road :- Barnala-Mansa (Mansa Kainchian to Ram Ditte Wala Chowk) (S3)				
S311	119.640	126.930	7.290	3
Total Length of S3 Road in Kms				7.290
Name of Road :- Mansa-Talwandi Sabo upto Ramtirath Jaga (S4)				
S411	0.000	5.000	5.000	5
S412	5.000	10.000	5.000	
S413	10.000	15.000	5.000	
S414	15.000	20.000	5.000	
S415	20.000	24.970	4.970	6
Total Length of S4 Road in Kms				24.970
Name of Road :- Dhanula-Bhikhi (S5)				
S511	0.000	5.000	5.000	
S512	5.000	10.000	5.000	5
S513	10.000	15.000	5.000	5
S514	15.000	20.000	5.000	7
S515	20.000	25.340	5.340	7
Total Length of S5 Road in Kms				25.340
Name of Road :- Bathinda-Kotshamir-Talwandi Sabo upto Ramtirath Jaga (B8)				
B811	9.200	15.000	5.800	
B812	15.000	20.000	5.000	
B813	20.000	25.000	5.000	
B814	25.000	30.000	5.000	
B815	30.000	37.850	7.850	35
Total Length of B8 Road in Kms				28.650
Total Contract Road Length in Kms				203.680
				129

## 2.3 MONITORING CONSULTANT VIEWS ON CONTRACTOR'S MONTHLY REPORT

### 2.3.1 CONTRACTOR'S STAFF PRESENT

Table 2-10 : CONTRACTOR'S STAFF PRESENT ON SITE

M/S PATEL INFRASTRUCTURE PVT. LTD.(ORGANISATION CHART)			
SI #	Position Numbers	Name of Person	Contact No.
1	Road Manager	Mukesh Kumar	8288032760
2	Team Leader	S.S. Sidhu	8288032757
3	Design Engineer	Pranav Ranjan (Feedback Consultant)	
4	Bridge Engineer	Mrs. Aruna (Feedback Consultant)	
5	Environmental Engineer	Parveen Kumar (Feedback Consultant)	
6	Social Specialist	Dr. Ananda (Feedback Consultant)	
7	IT Manager	Chirag Rana	
8	Field Engineer	Pankaj Kumar	8288032763
9	Senior Site Engineer	Upendra Kumar Thakur	8288032770
10	Site Engineer Construction	Vineet Yadav	8288032758
11	HR & Adm.	ParveenKahar	8288032780
12	Road Asset Manager	Rohit Malik/Vijay Kumar (New Joining)	8288032754
13	Plant & Equipment Engineer	R.K. Singh	8288032782
15	Contract Financial Manager	Parveen Kahar	8288032780
16	Road Safety officer	Ramesh Patil	8288032778
17	Billing/QS	Vijay Kumar	8288032754
18	Quality Control Incharge	Sanjay Pandey	8288032753
19	Junior Environmentalist	Ram Singh/Navneet	8288032793
20	Technician	Pargat Singh, Buta Singh, Jasbir, Hardev Singh, Jagtar Singh, Amandeep Singh, Gurjeet Singh, Dilveer Singh	N.A
21	Skilled Staff	49 Nos.	N.A
22	Semi Skilled	19 Nos.	N.A

### 2.3.2 CONTRACTOR'S STAFF UNDER CONTRACT

Table 2-11 : CONTRACTOR'S STAFF UNDER CONTRACT

Sr. No.	Position	Availability requirement
1	Road Manager	Full time
2	Road Asset Manager/Risk Manager	Full time
3	Senior Site Engineer	Full time
4	Site Engineer (Construction)	Full time
5	Site Engineer (Maintenance)	Full time
6	Conformance Management (Quality Assurance) Unit Leader	Full time
7	Material Engineer	Full time
8	Contract Financial Manager	Full time
9	Plant & Equipment Engineer	Full time

### 2.3.3 CONTRACTOR'S EQUIPMENT - WORKING/NO WORKING

Table 2-12 : CONTRACTOR'S EQUIPMENT – WORKING / NO WORKING

ID	EQUIPMENT TYPE AND CHARACTERSTICS	MIN.CAPACITY	No. of Equipments	REMARKS
1	HOT MIX PLANT (BATCH TYPE)	100 TPH	1	
2	WMM MIXING PLANT	60 TPH	1	
3	PAVOR FINISHER HYDROSTATIC WITH SENSOR CONTROL(BITUMIN WORK)	100 TPH	2	
4	HYDRAULIC EXCAVATORS	1.0M <sup>3</sup> BUCKET	2	
5	BLACKHOES	0.5M <sup>3</sup> BUCKET	2	
6	MOTOR GRADE	150KW	1	
7	LOADER	1M <sup>3</sup> BUCKET	2	
8	PAVER FINISHER MECHANICAL FOR WMM WORK	100TPH	1	
9	CONTRACTOR'S PATROL AND RESPONSE VEHICLES		2	
10	CONTRACTOR'S GENRAL INSPECTION VEHICLES (WITH GPS & DISACEMENT METERS)		3	
11	VIBRATORY ROLLERS	8-10 T	3	
12	PNEUMATIC TYRE ROLLER	8-10 T	2	
13	TIPPERS/TRUCKS	5.5M <sup>3</sup>	15	
14	WATER TANKER	6M <sup>3</sup>	3	
15	PAVEMENT MARKING PAINT		1	
16	BITUMEN PRESSURE DISTRIBUTOR		1	
17	POWER BLOOM		2	
18	FALLING WEIGHT DEFLECTOMETER (PAVMENT DEFLECTION TEST)		1	
19	CALIBRATED ROUGHNESS PROFILOMETER		1	

### 2.3.4 CONTRACTOR'S EQUIPMENT UNDER CONTRACT

Table 2-13 : CONTRACTOR'S EQUIPMENT UNDER CONTRACT

Item	Equipment Type and Characteristics	Min Capacity	Min. No.
1	Hot Mix Plant (Batch type)	100 TPH	1
2	WMM Mixing Plant	60 TPH	1
3	Paver Finisher Hydrostatic with sensor control (Bituminous Works)	100 TPH	2
4	Hydraulic excavators	1.0M <sup>3</sup> bucket	2
5	Backhoes	0.5 M <sup>3</sup> bucket	2
6	Motor Grader	150kW	1
7	Loader	1M <sup>3</sup> Bucket	2
8	Paver Finisher Mechanical for WMM Work	100TPH	1
9	Contractor's patrol and response vehicles		2
10	Contractor's general Inspection Vehicles (with GPS & Displacement meters)		3
11	Vibratory Rollers	8-10 T	3
12	Pneumatic Tyre Roller	8-10 T	2
13	Tipper / Trucks	5.5M <sup>3</sup>	15
14	Water Tanker	6M <sup>3</sup>	3
15	Pavement Marking Plant		1
16	Bitumen Pressure Distributor		1
17	Power Broom		2
18	Falling Weight Deflectometer (pavement deflection testing)		1
19	Calibrated Roughness Profilometer		1

### 2.3.5 PROGRESS WORK IN IMPROVEMENT REHABILITATION AND RESURFACING

As reported in other subchapter, the Contractor didn't carry out works of Improvement, Rehabilitation and Resurfacing on the December Month, because he finished the works corresponding to 2th year in November month (with some exceptions explained forward) and further the Contractor plans to restart works in the February Month according with the Program Work of the third year.

As reported in other subchapter, the Contractor didn't carry out works of Improvement, Rehabilitation and Resurfacing on the December Month, because he finished the works corresponding to 2th year in November month and further the Contractor plans to restart works in the February Month according with the Program Work of the third year.

Regarding to quality and comfort of improvement, rehabilitation and resurfacing works, until now we don't have the data both deflections and IRI. We hope to have the data available for the next monthly report. Therefore with the data available until now it isn't possible calculate the score of NON-CONFORMANCES corresponding to Road Durability Performance Measures - RDPM.

Anyway in routine inspections, we can see some sites with different damage types on pavements, which are presented in Chapter 3 - Results of detailed inspection.

### 2.3.6 NETWORK PERFORMANCE CONFORMANCE / NON CONFORMANCE - SCORES

Table 2-14 : NETWORK PERFORMANCE - CONFORMANCE / CONFORMANCE – SCORES

Refer Not Above	Non-Conformance	Number of Non- Conformances A	Multiplication Factor		Score A*B*C
			Weighting B	Sub Weighting C	
A	RDPM Non-Conformance	-	-	-	-
B	MPM-1 Quality Assurance System	2	2	4	16
C	RUS & CPM-1 Pavement Maintenance	3	2	1	6
D	RUS & CPM-2 Unsealed Shoulder Maintenance	47	1	1	47
E	RUS & CPM-3 Drainage Maintenance	7	2	1	14
F	RUS & CPM-4 Routine Maintenance of Bridges & Other Structures	1	2	1	2
G	RUS & CPM-5 Obstructions on the Pavement Surface and Shoulders	1	1	1	1
H	RUS & CPM-6 Incident Response & Emergency Works Response	0	2	1	0
I	RUS & CPM-7 Vegetation control	0	1	1	0
J	RUS & CPM-8 Road Signs Maintenance	14	2	1	28
K	RUS & CPM-9 Raised Pavement Markers	0	2	1	0
L	RUS & CPM-10 Pavement Marking	0	2	1	0
M	RUS & CPM-11 Traffic Island and Roundabout Maintenance	7	1	1	7
N	RUS & CPM-12 Crash Barrier Maintenance	0	1	1	0
O	RUS & CPM-13 Sight Rail, Hand Rail and Pedestrian Barrier Maintenance	0	1	1	0
P	RUS & CPM-14 Marker Post Maintenance	2	2	1	4
Q	Repeated Non-Conformance in Consecutive Months				60
R	Any Employer or Monitoring Consultant generated Non - Conformance				0
S	Any Immediate Safety Hazard to Road Users Instructed for Repair				0
Monthly Aggregated Contract Non-Conformance score					<b>185</b>

### 2.3.7 ENVIRONMENTAL AND SOCIAL REPORTS

An inspection was carried out by Environmental Experts of ICRA at project site of OPRC project for Improvement, Rehabilitation, and Resurfacing and Regular maintenance of 6 sections of roads in Punjab. The inspection was carried for all 6 sections and all road sites were visited. The experts also visited the construction camps & hot mix plants operated for the construction works.



**Status of Project:** No major construction work was undergoing. Only some repair and regular maintenance work was in process at some places.

**Scope of the report:** As the construction work was on hold, no assessment of Regular Environmental Safeguards practices could be done. Only compliance to several regulations and other framework were studied.

### Issues Discussed:

Following issues were discussed at site during inspection.

1. Disposal of Hazardous waste
2. Disposal of Municipal Solid waste from construction camps
3. Disposal of waste water from construction camps
4. Disposal of Construction waste
5. Pollution under control certificates of vehicles and construction equipment
6. Ground water use and approvals
7. Air pollution study and prediction modelling
8. Labour camp & labour insurance.
9. Hot Mix plants
10. DG sets

### Non – Compliances Observed:

**Observation 1:** Unauthorized withdrawal of Ground Water.

**Non Compliance:** It was observed that, no authorized source of water for domestic and other purposes in construction camps of contractor was available. As per the Monthly ESMF report and documents presented by the contractor representative following remarks were noted.

Activities	Statuary Authority	When Required	Status	Expiry date	Remarks	Non Compliance
Permission of withdrawal of Ground water for construction	Central Ground Water Board	Before extraction	Applied vide PIPL.OPEC/PWD/201/2013-14/007. Receiving No. 9083, 9084 at DC office Mansa	NA	Extraction of Water from Locally available bore well owner on payment mode.	<b>At Construction camp 2, extraction from bore well was observed. No approval has been obtained for the same. Also no document for authorization for sale of water for commercial use by local bore well owner was available.</b>

**Observation 2:** Location of Hot mix Plant.

**Non Compliance:** Hot mix plant and camp for employees were within the same plot boundary. As per MoEF guidelines hot mix plants to be installed at site where no residential zone is situated in 1000 m radius of hot mix plant site whereas the contractor have provided residential accommodation in same plot boundary of Hot mix Plant.

**Observation 3:** Air pollution prediction modeling has not been included in EIA reports.

**Non Compliance:** Contractor has prepared the Environment Impact assessment report for two Road sections of the project. But no prediction air modeling was carried out to study the impacts of pollution sources of the project. Air pollution prediction modeling to be incorporated in the EIA reports for the sections considered. EMP shall be prepared for the areas where maximum GLCs are observed during the modeling.

**Observation 4:** Disposal of Hazardous waste (used DG oil & other hazardous wastes).

**Non Compliance:** Agreement with the authorized vendor of PPCB for disposal of Hazardous material was not presented during inspection. Hazardous material can be handed over to Pollution Control Board's authorized vendors only. An agreement document shall be maintained for the records and proper logbook to be maintained.

In monthly ESMF report of contractor the expiry date of Consent for storage, Handling and Transport of Hazardous material was mentioned as NA (Not Applicable). After reviewing the consent letter it was observed that the consent was valid upto 27.08.2015 and needs to be renewed after that. The same shall be updated in ESMF report of contractor.

**Observation 5:** Handling & Disposal of Municipal Solid waste.

**Non Compliance:** Agreement with external agency for transport & disposal waste water from construction camps of contractor was not presented. For proper handling and disposal of waste water external agency has been involved. Agreement document and proper logbook shall be maintained for record keeping.

**Observation 6:** Disposal of construction debris.

**Non Compliance:** In monthly ESMF report of contractor the approval from gram panchayat was mentioned to be obtained for disposal of construction debris at village site. But the gram panchayat have mentioned only about the soil backfilling at low lying site. No specific approval for disposal of construction debris was mentioned. As per the Monthly ESMF report and documents presented by the contractor representative following remarks were noted.

Activities	Statuary Authority	When Required	Status	Expiry date	Remarks	Non Compliance
Debris Disposal Site	Gram Panchayat	Before Operational	Obtained	NA	Ch.6+300 R/S on S-2 road. required as debris being reused.	<b>Gram panchayat have mentioned only about the soil backfilling at low lying site. No specific approval for disposal of construction debris was mentioned.</b>

**Observation 7:** Plantation in and around the construction camp.

**Non Compliance:** During inspection of construction camps, it was observed that a very few plants were planted on the plot boundary of construction camp 2. Most of those plants were small in size and dry. A thick green belt is required on the plot boundary of Hot mix plant to control air pollution in the nearby area. Photographs showing the plantation in Construction camp are shown below.



**Observation 8:** Permission from forest Department for area under protected forest.

**Non Compliance:** Permission of forest department is required for diversion of forest land of protected forest on both sides of roads. As per monthly EIA reports submitted by contractor, application has been submitted for permission of all stretches for tree cutting, but approval for the same has not been obtained till date.

**Observation 9:** Health and safety training module has not been executed as per submitted in EMP.

**Non Compliance:** Health and safety training has not been organized as per the training module submitted in Environmental Management Plan submitted.

As per reports presented by contractor Six (6) Training Workshops for health and safety were to be conducted before starting of construction and Two (2) Training Workshops were to be conducted during construction phase of project. However, it was observed that no workshop was conducted before construction of project and two reports of workshops conducted during construction phase were presented by contractor. Contractor presented "Activity report" of workshop on Health safety & Environment organized & prepared by Consultant of Contractor & External NGO. Role of contractor in the workshops was not clear in the reports presented. Training and workshops shall be organized as per the training module submitted by contractor in Environment Management Plan for all road sections.

### 2.3.8 SITE VISIT REPORT- PRINCIPAL AUDITOR

During the site visits the following were the important common points in all sections:

1. Overall quality of new pavement varies between fair to good based on the fact that the car could travel at speeds of 60 kmph generally in most newly laid stretches with the maximum speed touching about 80kmph without much discomfort to the passengers. However stretches where no improvement/rehabilitation/resurfacing works have been undertaken are in poor to fair condition based on the pavement distress, observed potholes and shoulder conditions.
2. In total about 51.88km of Improvement works have been done as against a target of 74.8km in first 2 years of contract i.e. a shortfall of about 23km or -30.6%. This shortfall, in some respect, has been compensated by covering a larger length of Rehabilitation works- a length of 31.14km has been completed as against a target of 7.29km (an excess of about 24km or +327%) in the first 2 years. In the same period only 22.5km of Resurfacing has been completed as against a target of 34.2km (a shortfall of about 12km or -35%). In each individual case shortfall/excess has exceeded the limits specified in section 8.2.1 of contract. The total asset preservation activity (Improvement + Rehabilitation + Resurfacing) length falls short by about 9.3% of the target length for the first 2 years as required per contract.
3. In most places the improvement and/or rehabilitation works have been completed during the year 2014 from July to November (as per table below provided by MC Field Team). Some stretches the DBM has been laid but the BC covering has not yet been done. There has been some delay in completing the Improvement/Rehabilitation works for two main reasons – (i) delays in obtaining forest clearance for road improvement works in some stretches; and (ii) dispute between Employer and Contractor in interpretation of the minimum layer thickness of pavement structure design requirement as per the contract specifications.

S.No.	Section	Chainage	Work Done	Year/Month	Remarks
1	S-1	07.990 – 11.300 (b/s)	DBM	July 2014	Rehabilitation*
2	S-2	02.240 – 18.150 (b/s)	BC	June 2014	Improvement
3	S-2	68.000 – 79.000 (b/s)	BC	Mar 2014	Improvement
4	S-4	00.000 – 24.970 (b/s)	BC	Sep 2014	Improvement
5	S-5	00.000 – 25.340 (b/s)	BC	Jan 2014	Rehabilitation
6	B-8	09.200 – 15.000 (b/s)	BC	June 2014	Rehabilitation
7	B-8	15.000 – 37.850 (b/s)	--	Nov 2014	Resurfacing

\* Not covered with BC yet – can be considered half done.



4. However, indications of early pavement distress like segregation, ravelling, start-up signs of cracking/rutting etc. were observed in many places on newly laid pavements. Major failure of pavement at Kotshamir junction was observed and the quality of pavement seemed unsatisfactory at the junction of S-4 and B-8.
5. In super-elevated sections, in one or two places, as per cores taken by MC team, it seems the minimum thickness of bituminous layers is not present. BC layer of 30mm was observed instead of 50mm. The usual practice is to keep the minimum thickness as per requirement of specifications and build the pavement further on such curves and camber. It appears that this has not been done.
6. The existing road stretch between KM 67.5000 to Km 106.000 (Kotshamir junction) has badly deteriorated and has many potholes and other kinds of pavement distresses too. This is because of delays in carrying out Improvement works and there is an urgent need for some sort of intervention either improvement or at least resurfacing to maintain a good riding quality.
7. Another common problem on newly laid roads as well as on the existing road stretches where no works have been done was the level difference between the shoulders and the pavement edge. In many places the shoulder is depressed by about 10-15cm below the pavement edge especially on curves where the need for the shoulder support is maximum.
8. Some stretches require proper grading of the shoulder as well as the embankment slopes to allow for water to drain. Embankment slopes are being subjected to rain cuts and need some form of protection/maintenance to hold them together.
9. The quality of shoulders on S-5 seems suspect and not conforming to the specifications. The shoulder is not firm and seems to be too silty and not of proper grading because of which there was sinking even under tyres of light cars. In this light, proper sources/quarries of earth and stone metal for shoulder and other layers of roads and bridges should be identified by the Contractor and got approved by MC/Employer at the earliest.
10. Heaps of earth and construction materials on the edges of shoulders should be carted away and all construction debris should be cleared out off the site and dumped in proper dumping sites as per contract EMP to mitigate negative environmental impacts. Such heaps will also hinder pavement surface drainage of water to the sides.
11. During the site visit the MC team observed the construction of brickwork at a couple of culvert locations and was not satisfied with the quality and workmanship of the brickwork. This was pointed out to the site supervisor also who also was not in possession of the drawings for the culvert. The contractor should ensure that all site supervisors and engineers have, in their possession, approved drawings of the structures and other construction works being executed.
12. It seems that the centreline and other lane marking on new pavements in places do not have good reflectivity and in some places have started fading off. This was evident because of the cloudy and foggy/hazy weather during the days of the site visit when many times the thermoplastic paint on the new pavements was not visible clearly. Edge or shoulder marking has still not been done on some stretches of the road sections where improvement/rehabilitation has been completed 3-6 months back. This is not a very satisfactory situation.
13. Irrespective of the provisions in the contract, the MC team strongly feels the road delineators and cat-eyes should be provided all along the centreline and on the outer edges of sharp curves as per IRC specifications to improve safety – since this road is subject to heavy fog during winters and rains during monsoons.

14. Some verge and traffic islands are broken and need to be repaired. Chevron and other appropriate reflective/visible road and object markings as per contract, IRC codes and specifications need to be provided at traffic islands and gaps in median to improve the safety aspects.
15. It was encouraging to note that reflector boards have been placed in front of many culvert parapet walls to warn and alert drivers. However, there needs to be some consistency in this aspect. Some culvert and CD parapet walls which are close to the pavement edges did not have this board while some which were away from the edges and not so much of a hazard had been provided with these boards.
16. It was also encouraging to see most of the contractor's personnel wearing reflective jackets when working at site on culverts and shoulders especially since it was very foggy and visibility was poor.
17. More cautionary and information sign boards could be placed to warn the drivers of sharp curves, narrow culverts, built-up areas etc. in the interest of safety and reducing accidents a few of which were observed during the site visit days.
18. During the current visit not much of construction work was seen to be happening. However, the MC team will also monitor the construction safety aspects of proper barricading, diversion signs and personnel protection equipment (helmets and reflective jackets) as per the contract and EMP.

#### **Meeting with PWD-PRBDB officers/Employers:**

Post the site visits the MC team comprising the Team Leader, Asset Manager, Principal Auditor and the Auditor met with the Employer's Representative – the Executive Engineer (EE) and his subordinate officers on January 22 to discuss the site visit observations and concerns and also other topics which were raised by the EE. The discussion were very fruitful and summarised below –

The MC team highlighted the key issues observed by it at site as summarised under para 4 above. It expressed the concern that in spite of repeated notices and informing the client since its own mobilisation in October 2014, not much corrective actions have been taken by the contractor to either improve the network performance in terms of workmanship, quality, safety and reporting.

The EE appreciated the concern and advised the MC team to seek appropriate special joint inspections. If required, additional laboratory or other tests of potential sub-standard works may be sought from the contractor in its presence and supervision. Wherever deficient appropriate contractual action of issuing rectification notices may be got issued which may later be then penalised if not rectified within the specified time. No compromise on quality, performance, road safety can be tolerated beyond that allowed by the agreement and technical specifications.

The MC team also suggested that since the Improvement works to have been completed in the first 3 years are now getting delayed because of forest department clearances/permissions, the Employer may need to think of other ways to resolve the issues. One of the options could be to swap the Improvement and Resurfacing options. That is, in the stretches where the delay cannot be avoided due to delays in clearances/disputes etc. resurfacing on the existing width of the road can be done till such time as the road can be widened and improved. Otherwise, the existing road is deteriorated to a very bad extent as can be seen at site (point - VI of para # 4). However, in reply, the EE clarified that the money to be deposited with the forest department will be done very soon and the necessary clearances obtained to enable the contractor to commence improvement/widening works.



Roughness measurements and results need to be confirmed as per roughness measurement equipment ROMDAS agreed to be provided by the Employer which is not yet in place. This makes it difficult for the MC to validate the maximum and average roughness values on the new pavements as well as the entire network to be consistent with the contract.

EE also mentioned about the dispute - 2 which had been referred to the DRB and the decision conveyed by the DRB was in favour of the contractor. He wished to know the MC's view. Based on opinion received by the pavement specialist of the MC team, it was conveyed by the team leader of MC that it concurred with the view of the DRB that the contractor need not be bound by the minimum depth specified in contract to prevent reflective cracking etc. and is free to choose a more optimum design if it meets the performance and minimum life criteria. Even if the Employer decides to pursue the dispute further through arbitration or other legal means and the decision is in the favour of the Employer, it has to be borne in mind that the responsibility of design/specifications then probably would tilt towards the Employer which is not in the true spirit of the contract. However, the MC discussed that "Keeping in view the early signs of pavement distress observed on some of the already improved/widened stretches of the network within the first year itself, the contractor is advised to review its pavement design for overlay and widening portions and make any changes if/as required. This would ensure better performance of the pavement during the period of contract and further duration afterwards as stipulated in the contract."

### 2.3.9 CONTRACTOR'S CQAMP REPORT

1. In the very first line of the CQAMP (in para 1.1) there seems to be a factual mistake which refers to IRC SP:15 which is a code for Ribbon Development on Roads. Presumably, this reference should instead be to SP 57-2000. This itself shows that the QA process on CQAMP documentation has been poor on the contractor's part.
2. IRC SP-57-2000 deals with QA aspects of any general road project and encompasses systems and procedures applicable to the client/owner and the contractor/supplier. M/s Patel Infrastructure Pvt. Ltd (PIPL) should pick up only those aspects which pertain to them as contractors. Moreover, SP:57-2000 seems to be more applicable to conventional item-rate works contracts where design is done by another design agency and the works are executed by the contractor.
3. Here PIPL is responsible for Planning, Design and Execution of interventions and then Maintenance of the road network for 10 years. The current CQAMP has the detailed method statements for activities pertaining to testing and execution aspects of only Works which in this contract will pertain to Improvement/Rehabilitation/Resurfacing predominantly. These 3 aspects would fall under the Road Durability and Emergency works aspects of the contract. Moreover, the QC/QA at design and planning stages of Works is missing and how the contractor has organized the checks and balances to ensure proper designs internally.
4. However the present contract has 2 other components - Road User Services and Comfort and Management Performance for which there are payments/deductions based on timeliness, quality, workmanship, and safety and E&S aspects.
5. The primary responsibility of the Quality rests with the contractor in this case and the Employer and its representative MC will undertake periodic visits to check quality and performance of the network and are external to the contractor. PIPL's own systems internally of design and execution and then independent checks through Contractor's Conformance Unit (CCU) has to come out clearly. It has to be borne in mind that there is no provision for an Independent Engineer in this contract and that the PM is the Employer's representative.

6. Moreover the method statements in the current CQAMP refer to contractor personnel whose designations are not given in the PIPL's organization structure of the project. It seems like PIPL has just copied the CQAMP of some conventional works contractor and then cut/paste the contract specifications for activities which were not available. This is not satisfactory. The structuring of this CQAMP would need to be bit different and in compliance of the requirements of Section 7.2 of the contract mainly dealing with methods and how things will be accomplished by the contractor rather than just re-wording the specifications in a different form.
7. One of the many ways in which the CQAMP may be re-structured is as follows –
  - a. First one or two chapters could be dealing, in brief, with general aspects like details of the contract, site location and map, site plan, contract management framework, summary of scope and interventions required, contract specifications, performance criteria and payment/penalty methods.
  - b. The next chapter could be a detailed project organization structure which encompasses the key top and middle level officers who will be directly responsible for all operations i.e. Planning, designing, execution, network performance maintenance, safety/social/environmental aspects and reporting. These activities executed by the different people would need to be checked for quality and conformance by another group of people called the CCU. The Operations Unit and the CCU should be detailed out by an organogram of designations. There should be a table which then describes the current incumbents to each of these positions. If there are any sub-contractors or design consultants working with the contractor, these should also be highlighted in the organization chart along with the details of key persons.
  - c. The CQAMP should then, in the next few chapters, describe each aspect of the contract like (i) Improvement; (ii) Rehabilitation, (iii) Resurfacing, (iv) Emergency Works, (v) Network Road User Services Performance services which comprise of routine/ordinary maintenance as well as safety/environmental aspects, and (vi) Reporting through periodic reports as required by contract.
  - d. Each of the above 6 aspects need to be further broken down to activities and sub-activities and described in detail through individual method statements for them which includes testing and QC. This needs to include the various stages of each activity like planning, designing, execution, maintenance and independent QC/QA as appropriate for each activity. The key contractor persons/designations responsible for planning, designing, execution and maintenance of each activity as well as the contractor personnel from CCU responsible for conformance/QC/QA management need to be also highlighted. The two aspects should be independent. There should be consistency between the designations in the project organization chart and the designations mentioned in the method statement for person responsible.
  - e. Input materials and finished product quality checking procedures, sampling procedures, approvals of sources of materials, laboratory procedures etc. should be briefly highlighted consistent with the contract agreement and the codes and specifications referred therein.
  - f. Activities which require the inspection/approval/clearances of the Employer/MC as per contract should be highlighted and a system set up to submit these on time to the Employer/MC and following up with them,

- g. Other government and non-government agencies and committees like LRC with whom the contractor needs to liaise as well as interact should be highlighted and a responsibility matrix for approvals from Employer and other agencies like Forest etc. should be indicated.
- h. Testing, inspection and reporting forms and formats could all be pushed into appendices/annexes and reference can be made to them in the main chapters.

## 2.4 SUMMARY & COMPARISON – NON CONFORMANCES.

### 2.4.1 CONTRACTOR'S STAFF

It is undertaken a reviewing of Contractor's Key Staff included in the proposal, regarding the current Key Staff that is included in Contractor's Monthly Progress Report. In said reviewing is found that any Key Staff included in the proposal is working now in the project. As Project's documental support it is required to Employer's Representative, the documents in which is approved the changes of the personal.

### 2.4.2 CONTRACTOR'S EQUIPMENT

It is also undertaken a reviewing of Contractor's equipment included in the proposal regarding the current equipment that is included in Contractor's Monthly Progress Report. In said reviewing is found that the Contractor's all Equipment is in the site. However cannot saw working because at this time the Contractor carries out only Network Performance Works.

### 2.4.3 ANALYSIS AND COMMENTS OF THE PERFORMANCE AUDIT INSPECTION

This chapter provides a description and analysis of the inspection audit reports submitted by the contractor, corresponding to December Month comparison with the inspection audit of the MC.

Network Performance Inspection of each one of the below items:

- Management Performance Measures (MPM's)
- Road User Service and Comfort Performance Measures (RUS&CPM's)
- Road Durability Performance Measures (RDPM's).

According to the Contract Specifications (Appendix 8), the contractor and MC performs the Audit Inspections using the format RM03. Below is included a summary the audit for each of the types of Performance Measures set out in the contract.

Table 2-15 : Summary NON-CONFORMANCES

ID	DESCRIPTION	SCORES Contractor	SCORES MC
1	Total Management Performance Non-Conformance Score (MPM'S)	16	16
2	Total Road User Safety & Comfort Non-Conformance Score (RUS&CPM'S)	129	169
3	Total Road Durability Non-Conformance Score (RDPM'S)	0	0
	<b>Total Score of NON-CONFORMANCES</b>	<b>145</b>	<b>185</b>

In the above table the comparison of the NON-CONFORMANCES submitted by the Contractor with the score done by the MC is given.

It is very important to report that after review and analysis of the contractor's Monthly Performance Audit Report of the road network corresponding to December Month, the Contractor recorded 145 NON - CONFORMANCES, which is not according to the score calculated by MC (185 NON - CONFORMANCES), during the inspection carried out on the different sectors that make up the network, whereby the network don't achieve the service levels required. The details of the Monthly Detailed Inspection are presented in the following chapter (Chapter 3).

Therefore it is required to immediately repair of all defects and problems existing in the roads and delivery the reports in the terms according the contract, for avoid the delayed delivery of MPR both the contractor and the Monitoring Consultant according with the Clause 15.1 of the Section VI - Specifications (paragraph 4TH).

The Monitoring Consultant recommends to the Client to take those NON-CONFORMANCES into account in the payment to Contractor corresponding to the Month December, 2014. The details of each kind of Non-Conformances are including below.

#### 2.4.4 MANAGEMENT PERFORMANCE MEASURES (MPM's)

According the Contract Agreement, the Management Performance Measures (MPM's) reflect the ability of the Contractor to successfully manage the contract outputs including the quality and efficiency of his reporting of information to the Employer.

Regarding the Management Performance Measures, it is presented below a table a summary of the documents submitted for the Contractor corresponding to month of December and the comparison with the reported by the MC.

Table 2-16 : Management Performance Measures (MPM's)

Reference to Bidding Document Section VI	Item Description	Performance Measure Compliance	Non-Conformance Weighting	Sub-Weighting Days/Weeks/Months of Recorded Non Conformance	N° Non-Con X Weigh x SubW	Total Non-Conformance Score AxBxC Contractor	Total Non-Conformance Score AxBxC MC
MPM 1	Quality Assurance System	Non Conformance due IRI data not submitted submission of Environmental Management Plan (EMP) Environmental Screeninn 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)	2	Each week of delay	1 * 2 * 4	8	0
MPM 1	Quality Assurance System	Non Conformance due FWD data not submitted to Submission of Environmental Management Plan (EMP) Environmental Screeninn 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)	2	Each week of delay	1 * 2 * 4	8	0
MPM 3	Contractor's Reports	No Non-Conformance for submission of Contractor's IRI Survey	2	Each day of non receipt after deadline	1 * 2 * 4	0	8
MPM 3	Contractor's Reports	No Non-Conformance for submission of Contractor's FDW Survey	2	Each day of non receipt after deadline	1 * 2 * 4	0	8
MPM 3	Contractor's Reports	No Non-Conformance for submission of Contractor's Monthly Progress Report	2	Each day of non receipt after deadline	1 * 2 * 24	0	
			<b>Total Management Performance Non-Conformance Score</b>			<b>16</b>	<b>16</b>

The Contractor includes Non - Conformances corresponding to Reports in the issue of Quality Assurance (Code MPM 1).

According with our criteria and with the interpretation of the contract, the NON-CONFORMANCES of the Reports should be including in "Contractor's Reports" - Code MPM 3. We agree with this NON-CONFORMANCE.

But the contractor doesn't include NON-CONFORMANCES corresponding to delay in delivery of the Monthly Progress Report which had a delay of the 24 days. (January 15, 2015 - February 7, 2015). The next Monthly Report of the MC will include this NON-CONFORMANCE in the final score.

#### 2.4.5 ROAD USER SERVICE AND COMFORT PERFORMANCE MEASURES - RUS&CPM

According the Contract Agreement the Road User Service and Comfort Performance Measures (RUS&CPM) reflect the road user's expectation about the day to day serviceability of the roads under the Contract. The Contractor must comply with the Contract Standards specified for each RUS&CPM.

The objectives of the Contract Standards are to ensure that a defined Level of Service is maintained which reflects the road user's day to day serviceability expectations across the range of Contract assets, and to permit auditing of the Contractor's performance.

The Monitoring Consultant reported 169 NON-CONFORMES according with the Inspection carried out in site and after review of the reports submitted by the contractor while the Contractor reports 129 NON-CONFORMANCES.

On the below table is done the comparison of the NON-CONFORMES submitted by the Contractor with the score done for the MC regarding to Road User Service and Comfort Performance Measures - RUS&CPM. It is observed that the scores are different.

The calculation of the RUS score included NON-CONFORMANCES due to the lack of edge lines in Section S5. The reasons of the decision are included later.

Reference to Bidding Document Section VI	Item Description	Minimum Audit Length for Each Recorded Non - Conformance	Total Non-Conformance Score A*B*C Contractor	Total Non-Conformance Score A*B*C MC	Comments
RUS&CPM1	Pavement Maintenance	5km (1km for cracking)	0	6	
RUS&CPM2	Unsealed Shoulder Maintenance	5km (1km for cracking)	47	47	
RUS&CPM3	Drainage Maintenance	1km	12	14	
RUS&CPM4	Routine Maintenance of Bridge and other Structures	5km (1km for cracking)	2	2	
RUS&CPM5	Obstructions on the Pavement Surface and Shoulders	1km	1	1	
RUS&CPM6	Incident and Emergency Works Response	N/A	0	0	
RUS&CPM7	Vegetation Control	5km	0	0	
RUS&CPM8	Roadside Signs Maintenance	5km	0	28	
RUS&CPM9	Raised Reflective Pavement Markers	5km/1km	0	0	
RUS&CPM10	Pavement Markings - (Lines, Text, Symbols etc)	5km	0	0	
RUS&CPM11	Traffic Island and Roundabout Maintenance	5km	7	7	
RUS&CPM12	Crash Barrier Maintenance	5km	0	0	
RUS&CPM13	Sight Rails, Hand Rail and Pedestrian Barrier Maintenance	5km	0	0	
RUS&CPM14	Marker Posts (Guard Stones, Boundry, Edge, Culvert, Distance Markers, Hazard)	5km	0	4	
Any RUS&CPM	Repeated Non-Conformance in Consecutive Months	5km	60	60	
Any RUS&CPM	Any Employer or Monitoring Consultant generated Non - Conformance	5km	0	0	Identify for MC
Any Road Safety Hazards	Any Immediate Safety Hazard to Road Users Instructed for Repair	5km	0	0	
TOTAL			129	169	

Table 2-17 : Accumulated Summary of NON-CONFORMANCES –RUS&CPM Measures



## REASONS FOR MARKING CENTER LINE AND EDGE LINE IN ALL SECTORS

According to the Contract Agreement, the Contractor should include in the Contractor's Lump Sum price for Network Performance Works, the cost of any additional pavement remarking required to bring the Contract's roads up to the required standard for the defined road category.

The Contract Agreement also says in the Clause 15.13.2, that at any time during the contract, all network should be perfectly demarcated with lines of demarcation (Centre line and edge line), with the exception of the first year in which the lines are not painted before the improvement works, rehabilitation or resurfacing.

The same Clause says "All State Highways (SH) and Major District Roads (MDR) shall have a painted centreline and edge lines in place". According to the Contract, the Section S5 is classified as a Major District Road (MDR).

The roads conforming to the network of the project OPRC are characterized for to have visibility low in the nights, in winter season and on presence of monsoons, therefore are very important both the centreline and the edge lines on all sectors of the network, for safety of the road's users. (IRC-35 - Subchapter 8.6.1. and 8.6.2.).

Therefore, all sectors conforming to the network shall be marked during the Contract besides shall have a good reflectivity for ensure the safety of road's users without excuses.

The Monitoring Consultant highlights the fact that the Contractor doesn't detected 76 (205-129) NON-CONFORMANCES regarding to RUS& CPM Measures. According to the Contract Agreement this NON-CONFORMANCES have a weighting equal to 6 and a sub-weighting equal to 1 whereby each NON-CONFORMANCE don't detected by the Contractor is equivalent to 6 NON-CONFORMANCES which increase the score on 6 times. It is advised to the Contractor shall to include all NON-CONFORMANCES on the next MPR for avoid increase of score for this criteria. The next Monthly Report of the MC will include this NON-CONFORMANCE in the final score.

### 2.4.5.1 SUMMARY OF THE NETWORK PERFORMANCE INSPECTION

## DEFECTS ON THE PAVEMENTS

On the inspections of Month December, the Monitoring Consultant has noted Early Distresses pertaining to pavement such as presence of cracks, segregation and Rutting on new pavements.



Figure 2-1 : Sector S2 – Cracking – km 5+560 R.H.S

## SHOULDERS MAINTENANCE

Also, the Monitoring Consultant has noted MANY DEFECTS pertaining regarding to the Unsealed Shoulders Maintenance. In many sites of the network, the scale between the non-paved shoulders with respect to pavement level is greater than 5 cm (threshold as per the contract). In some places the water accumulation is between the pavement edge and unpaved shoulders which generate a high risk of water infiltration that decrease the structural capacity of the pavement.

This is due to the fact that the Routine Maintenance is very poor and the shoulder does not have sufficient slope for to drain water.

Other sites have accumulation of waste placed on shoulders that obstruct the normal flow of the water. These deficiencies are observed in the S5 sector.



Figure 2-1 : S5 - Water and Marking



Figure 2-2: S5 – Cut Vegetation / Tree Branches

## VEGETATION CONTROL

On many sections of the network, it is observed that vegetation is there on berms. The trees obstruct the visibility of the road and the road signs. The cutting of the vegetation shall ensure the perfect visibility of the road and of the signals in accordance with the contract specifications and the norms of the Forestry Department.

## DEFICIENT SIGNS

During the visit to the network is observed that the signaling is very deficient, mainly of signs "warning" near the sites of risk on the road such as dangerous curves. The Section S4 doesn't have warning signs throughout the sector and the regulatory signals are very slim. It is very important to remember that the signals shall be installed in accordance to the standards IRC 93–1985 and IRC 67–2001, for both location and to determine the quantity of signals.

## DRAINAGE MAINTENANCE

The drainage system also has many defects and NON-CONFORMANCES due to that the drains are wholly or partially obstructed, resulting in stagnation of the water and subsequent infiltration which in turn may damage to the pavement structure.

## MARKER POST MAINTENANCE

The MARKER POST MAINTENANCE is deficient in the different sectors that make up the network. The paint has a deficient maintenance, besides is require replacement some the reference posts and



stones. Also, it is deficient the markings maintenance of the culverts, because it doesn't comply the desired standards. It has observed that some posts were destroyed and should be replaced immediately.



Figure 2-3 : Sector S2- Culvert clogged - Km 59+200 B.H.S



Figure 2-4 : Sector S3- No Culvert marking - Km 126+500 R.H.S

## MARKINGS

The Marking lines are very poor in different sectors; even there are some sections without demarcation both of the edge lines as is observed on the Section S5 besides the center line is practically erased. The Section S2 also has a few sections in which the line's marks are can barely watch.



Figure 2-5 : Sector S3 - Marking lost – Km 119+900 B.H.S



Figure 2-6 : Sector S1 – Worn out pavement marking – 10+500 B.H.S

#### 2.4.5.2 RECOMMENDATION OF NETWORK PERFORMANCE WORKS

The Network Performance is deficient due of inadequate onsite manpower of the project by the Contractor for carry out the Network Performance Works.

As per international experiences, for the present kind of network, it is recommended to Contractor, form groups of 8 and 10 persons for carry out routine maintenance work, per 40 or 50 kilometres of road length. The personas number may be adjusted according to yields, local conditions and type of sector.

The work teams in charge of routine maintenance should have a daily program of work of all activities that perform routine maintenance and a daily average of 2 kilometres.

#### 2.4.6 ROAD DURABILITY PERFORMANCE MEASURES

According the Contract Agreement, Road Durability Performance Measures (RDPM's) are the measures undertaken by the Contractor to protect the pavement & surfacing assets, and check the consumption of these assets over the duration of the contract. The Contractor should take full ownership of the intent of these measures and manage their performance proactively throughout the year.

Contract requirements specify the minimum quantity of asset preservation works that the Contractor must achieve throughout the contract. The Contractor must achieve full Conformance with the following RDPM's.

Table 2-18 : Road Durability Performance Measures (RDPM's).

Nomenclature	Road Durability Performance Measures (RDPM's)	Action in Case of Non-Conformance
RDPM-1	Minimum Annual Asset Preservation Quantities	Liquidated Damages (Clause 8.2.1.1)
RDPM-2	Pavement Roughness	Deduction in certain %age of payment due / released for the work in defaulting Section (Clause 8.2.2.4) on new construction
RDPM-3	Pavement deflection	Deduction in certain %age of payment due / released for the work in defaulting Section (Clause 8.2.3.4) on new construction
RDPM-4	Roadway Cut and Embankment Slopes	Non-conformances will be included in the monthly aggregated non-conformance score (Clause 8.2.4.1).

The Road Durability Performance Measures (RDPM's) are the measurements made by the contractor to protect the pavement and the active surface of the pavement. Below it is described the current state of each Performance Measure.

Table 2-19 : Accumulated Summary of NON-CONFORMANCES -RDPM Measures

Reference to Bidding Document Section VI	Item Description	Number of Non-Conformances Recorded	Non-Conformance Weighting	Sub-Weighting Days/Weeks/Months of Recorded Non Conformance	Total Non-Conformance Score AxBxC Contractor	Total Non-Conformance Score AxBxC MC
RDPM2	Pavement Roughness	0	5		0	-
RDPM3	Pavement Deflection	0	5		0	-
RDPM4	Roadway Cut and Embankment Slopes	0	5		0	-
Total Road Durability Non-Conformance Score					0	-

On above table of Road Durability Performance Measures, don't includes score values due a the reasons that are explained in the next sub-chapter. Therefore this Monthly Progress Report doesn't include scores.

#### 2.4.6.1 MINIMUM ANNUAL ASSET PRESERVATION QUANTITIES - WORK PROGRAM

As explained in Subchapter 2.1 this measure pertains to the fulfilment in the Contractor's work annual program that was approved for the employer for three years and is binding on the Contractor.

In this moment the project can't has a fixed program work, because there are case of force majeure that do not allow the planning of the work for the third year.

The cases of force majeure that the employer don't has resolved are the payment to Forest Department corresponding to works in the Section No 2 and the Dispute Review Board DRB regarding pavement design corresponding to works in the Section No 1.

This implies the delay of works, the consumption of assets during the contract period and uncertainty regarding the planning and execution of the third year of work.

Therefore the Contractor only can begin works in the Section No 3, which has pending the approving of the changes and the budget, required from the employer.

The Monitoring Consultant recommends to Client resolve the pending issues as soon as possible for avoid major consumption of the assets during the validity of the contract.

#### 2.4.6.2 PAVEMENT ROUGHNESS (RDPM-2).

The roughness is a measure of comfort of road users and in accordance with the provisions of Chapters 8 and 16 of Part 2A of the contract specifications, the liability of the measure is by employer, who must measure semi-annually the values corresponding to parameter which is the IRI (International Roughness Index). Also is very important clearly understanding that this shall not limit the right the employer to carry out measurements any time during the entire contract.

Regarding to Road Durability Performance Measures, corresponding to the roughness parameter, the client has in its possession the ROMDAS equipment used for the measurement of the aforesaid parameter with great precision.

The equipment was calibrated and it is did a test of verification, but still isn't beginning the measures on the network. Therefore until now there are not records of roughness measures in the site and is not possible to define the Conformance of this parameter and the current state of the network.

We hope will to have the roughness records and the analyses of the information in the next Monthly Progress Report for to calculate the score (RDPM-2).

The contractor on his own has carried out measurement of the roughness and has records Technical data of Section S2 (2+240 to 18+400 and 68+000 to 79+000) and the Section S5, which has been reported with state "good". It is may be observed that the individual values has an average range between 1 and 1.5 m/km. This average is bellow of the thresholds established in the contract, but is needs to check them, because the Employer wants that test should be done with ROMDAS.

We have noticed that some subsectors of the network might exceed the threshold and Service Level required in the specifications of the contract, based in our experience and upon the site visits undertaken which is will verified and clarified in the next Monthly Progress Report.

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

#### **2.4.6.3 PAVEMENT DEFLECTION (RDPM-3)**

It is not found deflection records in the available files of the Employer's Representative, of the Sections under Improvement Works and Rehabilitation Works built in the first year, nor neither in the works of the second year.

As per the Contract Agreement, the contractor purchases the equipment Falling Weight Deflectometer Dynatest 8000, which only until November of 2014 begins with testing, adjustment and pavement deflection measurements.

The contractor has submitted a data report which does not conform to the specifications of ASTM required whereby this report has been returned to the contractor for complementation.

Therefore to the cut-off date of this report, we don't have outcomes of measurement of pavement deflection and at this time not possible to know the structural capacity of the pavement in the different sections of the network which is calculated based on the Central Deflection Do and the Curvature Do – D200 (mm). Nor can determine CONFORMANCES OR NON-CONFORMANCES with respect to measures of deflections and curvature. Furthermore it is not known some official document certifying the calibration of said equipment.

We hope will to have the deflection records and the analyses of the information in the next Monthly Progress Report for to calculate the score (RDPM-3).

#### **2.4.6.4 ROADWAY CUT AND EMBANKMENT SLOPES (RDPM-4)**

The contractor does not report events regarding to the measures of Roadway Cut and Embankment Slopes. On field observations carried out by the Consultant, also not is detected problems with regard to this topic.

### 3 MONITORING CONSULTANT'S VERIFICATION INSPECTION AUDIT

#### 3.1 INSPECTION'S DETAIL REPORT

Table 3-1 : VERIFICATION INSPECTION AUDIT – SECTION S1

Section - S1				
SI #	Chainage	Side	Road Warning/Informatory Guide Signs	Remarks
1	0+000	Median	Advance warning sign	Spring post delineator/Marking
2	1+400	R/S	Village sign board	Unknown village
3	2+200	R/S	Village sign board	Uppli village
4	2+300	B/S	Advance warning sign	CURVE PORTION
5	4+200	L/S	Village sign board	Uppli village
6	6+200	B/S	Village sign board	Bhunga village
7	6+700	B/S	Advance warniing sign	CURVE PORTION
8	8+200	B/S	Village sign board	Pularan village
9	9+000	B/S	Advance warning sign	CURVE PORTION
10	10+000	R/S	Advance warning sign	CURVE PORTION
11	10+000	R/S	Village sign board	Akalgarh village
12	10+600	R/S	Advance warning sign	Speed limit
13	10+400	L/S	Advance warning sign	Speed limit
14	11+300	Center	Advance warning sign	Spring post delineator/Marking

Table 3-2 : VERIFICATION INSPECTION AUDIT – SECTION S2

Section - S-2				
SI #	Chainage	Side	Road Warning/Informatory Guide Signs	Remarks
1	2+240	Median	Warning Sign	Spring Post delineator/markig
2	3+000	R/S	Warning Sign	School Sign board
3	3+100	L/S	Warning Sign	School Sign board
4	2+700	L/S	Warning Sign	School Sign board
5	3+300	R/S	Warning Sign	School Sign board
6	4+700	L/S	Warning Sign	Curve Portion
7	4+900	R/S	Warning Sign	Curve Portion

8	8+400	L/S	Warning Sign	Curve Portion
9	8+600	R/S	Warning Sign	Curve Portion
10	8+700	L/S	Warning Sign	Go slow
11	9+050	R/S	Warning Sign	Go slow
12	9+300	L/S	Warning Sign	Curve Portion
13	9+650	R/S	Warning Sign	Curve Portion
14	11+100	R/S	Warning Sign	School Sign board
15	11+400	L/S	Warning Sign	School Sign board
16	11+800	L/S	Village Sign board	Sangredhi village
17	12+300	L/S	Warning Sign	Curve Portion
18	13+000	R/S	Warning Sign	Curve Portion
19	13+500	L/S	Warning Sign	School Sign board
20	13+750	R/S	Warning Sign	School Sign board
21	14+100	R/S	Warning Sign	School Sign board
22	13+900	L/S	Warning Sign	School Sign board
23	15+600	L/S	Advance Warning Sign	Curve Portion
24	15+650	L/S	Warning Sign	Curve Portion
25	17+000	R/S	Warning Sign	Curve Portion
26	17+300	L/S	Warning Sign	Curve Portion
27	18+100	L/S	Village Sign board	Patran/Sangrur(MehlaChowk)
28	18+100	Median	Spring post /kerb paint chevron marking	Junction(A-1 side)
29	18+350	Median	Spring post /kerb paint chevron marking	Junction(A-2 side)
30	20+400	L/S	Warning Sign	Curve Portion
31	20+900	R/S	Warning Sign	Curve Portion
32	20+880	L/S	Warning Sign	School Sign board
33	21+100	R/S	Warning Sign	School Sign board
34	21+250	L/S	Village Sign board	Biggardhwaal village
35	21+450	R/S	Village Sign board	Biggardhwaal village
36	23+200	L/S	Warning Sign	Petrol pump
37	23+400	R/S	Warning Sign	Petrol pump
38	23+400	L/S	Village Sign board	Bishanpura village
39	23+800	R/S	Village Sign board	Bishanpura village
40	23+800	L/S	Warning Sign	Petrol pump



41	24+100	R/S	Warning Sign	Petrol pump
42	24+500	Median	Spring post delineator /kerb paint/ chevron marking in Gap Median	Intersection(S-1 And S-2)
43	26+400	L/S	Warning Sign	Roundabout/Chevron marking
44	27+380	Median	Warning Sign	Spring post delineator/hevron marking in Gap Median
45	27+450	Median	Warning Sign	Spring post delineator/chevron marking /kerb paint
46	27+700	Median	Warning Sign	Spring post delineator /chevron marking/paint
47	28+200	Median	Warning Sign	Chevron marking
48	28+500	Median	Warning Sign	Spring post delineator /chevron marking/paint
49	28+700	L/S	Warning Sign	Curve Portion
50	28+900	R/S	Warning Sign	Curve Portion
51	29+100	L/S	Village Sign board	Bhagvanpur village
52	29+250	R/S	Village Sign board	Bhagvanpur village
53	29+550	L/S	Warning Sign	Curve Portion
54	29+750	R/S	Warning Sign	Curve Portion
55	29+900	L/S	Warning Sign	petrol pump
56	32+000	L/S	Village Sign board	2 No.model town village
57	32+200	R/S	Village Sign board	2 No.model town village
58	32+300	L/S	Village Sign board	Jung Singh khiva village
59	32+500	R/S	Village Sign board	Jung Singh Khiva village
60	32+500	L/S	Village Sign board	1 No. model town village
61	33+200	R/S	Village Sign board	1 No. model town village
62	33+450	L/S	Village Sign board	Kassiyal village
63	33+650	R/S	Village Sign board	Sheron village
64	33+500	L/S	Warning Sign	Cross road
65	33+650	R/S	Warning Sign	Cross road
66	34+900	L/S	Warning Sign	School Sign board
67	35+100	R/S	Warning Sign	School Sign board
68	34+900	L/S	Village Sign board	Kotraamru



69	35+100	R/S	Village Sign board	Sheron village
70	36+450	L/S	Warning Sign	Curve Portion
71	36+500	L/S	Warning Sign	No overtaking
72	36+800	R/S	Warning Sign	Curve Portion
73	36+850	R/S	Warning Sign	No overtaking
74	37+750	L/S	Village Sign board	Sheron/Badhrukha/Ubhwal village
75	38+610	L/S	Village Sign board	Cheema village
76	38+800	R/S	Village Sign board	Cheema village
77	39+450	L/S	Village Sign board	Shahpura Sheron village
78	39+650	R/S	Village Sign board	Shahpura Sheron village
79	39+500	L/S	Warning Sign	Speed Limit
80	39+600	R/S	Warning Sign	Petrol pump
81	39+800	L/S	Warning Sign	Petrol pump
82	40+300	L/S	Warning Sign	Petrol pump
83	40+500	R/S	Warning Sign	Petrol pump
84	40+500	L/S	Village Sign board	Heron kalan village
85	40+700	R/S	Village Sign board	Heron kalan village
86	41+300	L/S	Warning Sign	School Sign board
87	41+500	R/S	Warning Sign	School Sign board
88	42+150	L/S	Village Sign board	Heron kalan village
89	42+350	R/S	Village Sign board	Heron kalan village
90	42+250	L/S	Warning Sign	School Sign board
91	42+450	R/S	Warning Sign	School Sign board
92	42+200	L/S	Village Sign board	Veer kalan village
93	42+900	R/S	Village Sign board	Veer kalan village
94	42+700	L/S	Village Sign board	Heron kalan village
95	42+900	R/S	Village Sign board	Heron kalan village
96	44+900	L/S	Warning Sign	School Sign board
97	45+100	R/S	Warning Sign	School Sign board
98	45+400	L/S	Village Sign board	Heron kalan village
99	45+600	R/S	Village Sign board	Heron kalan village
100	45+450	L/S	Warning Sign	Hospital Sign

101	45+650	R/S	Warning Sign	Hospital Sign
102	45+600	R/S	Warning Sign	School Sign board
103	46+600	L/S	Village Sign board	Veerkhurd village
104	46+650	R/S	Village Sign board	Veerkhurd village
105	46+500	L/S	Village Sign board	Daipе village
106	50+350	L/S	Village Sign board	Jassadh/Hodel kalan village
107	50+550	R/S	Village Sign board	Jassadh/Hodel kalan village
108	51+150	L/S	Village Sign board	Koteydiwankhera
109	51+350	R/S	Village Sign board	Koteydiwankhera
110	53+600	R/S	Warning Sign	Narrow bridge ahead
111	54+200	L/S	Warning Sign	Speed Limit
112	54+100	L/S	Village Sign board	Bhikhi/Dhanula village
113	54+200	R/S	Village Sign board	Bhikhi/Dhanula village
114	55+400	R/S	Warning Sign	Speed Limit
115	55+250	L/S	Warning Sign	Bhudlada City Sign
116	58+550	L/S	Village Sign board	Attal kalan village
117	58+750	R/S	Village Sign board	Attal kalan village
118	58+500	L/S	Village Sign board	Kotdha village
119	58+850	L/S	Village Sign board	Mulan Singh Wala village
120	59+050	R/S	Village Sign board	Mulan Singh Wala village
121	59+100	R/S	Village Sign board	Kotdha village
122	63+800	L/S	Village Sign board	Bappiyana village
123	64+000	R/S	Village Sign board	Bappiyana village
124	64+000	L/S	Village Sign board	Attal Kalan Bhupal village
125	64+200	R/S	Village Sign board	Attal Kalan Bhupal village
126	64+000	L/S	Village Sign board	Khyalakalan/Bappiyana village
127	64+600	L/S	Warning Sign	School Sign board
128	64+800	R/S	Warning Sign	School Sign board
129	65+000	R/S	Village Sign board	Khyalakalan village
130	65+000	R/S	Warning Sign	Hospital sign
131	65+000	L/S	Warning Sign	Petrol pump
132	65+200	R/S	Warning Sign	Petrol pump
133	65+500	L/S	Village Sign board	Mansa khurd/ubha village

134	65+700	R/S	Village Sign board	Mansa khurd/ubha village
135	67+500	L/S	Warning Sign	Speed Limit
136	67+600	L/S	Warning Sign	Roundabout (Mansa kenchiyan)
137	67+550	L/S	Warning Sign	Mansa kenchiya
138	67+650	Median	Spring post delineator /Kerb paint/ Chevron marking	Island roundabout (Mansa kenchiyan A-1 side arrival)
139	67+900	Median	Spring post delineator/Kerb paint/Chevron marking	Island roundabout (Mansa kenchiyan A-1 side arrival departure)
140	67+700	L/S	Warning Sign	Petrol pump
141	67+750	R/S	CITY NAME	BARNALA /MANSA/SUNAM SIGN
142	69+800	L/S	Warning Sign	Narrow bridge ahead
143	70+000	R/S	Warning Sign	Narrow bridge ahead
144	72+100	L/S	Village Sign board	BHAINE BHAGA DE KOTTE VILLAGE
145	72+300	R/S	Village Sign board	BHAINE BHAGA DE KOTTE VILLAGE
146	72+600	L/S	Warning Sign	Hospital sign
147	72+800	R/S	Warning Sign	Hospital sign
148	72+700	L/S	Warning Sign	School Sign board
149	72+950	R/S	Village Sign board	BHAINE BHAGA VILLAGE
150	73+350	L/S	Warning Sign	Danger sign
151	73+500	R/S	Warning Sign	Narrow bridge ahead
152	73+800	L/S	Warning Sign	Danger sign
153	74+250	R/S	Warning Sign	Danger sign
154	76+150	L/S	Warning Sign	Speed Limit
155	76+550	R/S	Warning Sign	Speed Limit
156	76+500	R/S	Village Sign board	Bhaintesa village
157	77+600	L/S	Warning Sign	School Sign board
158	77+800	R/S	Warning Sign	School Sign board
159	77+900	L/S	Warning Sign	Narrow bridge ahead
160	81+500	R/S	Village Sign board	Gumman village
161	82+050	L/S	Village Sign board	Gumman kalan village
162	82+150	R/S	Village Sign board	Gumman kalan village

163	82+800	L/S	Warning Sign	Petrol pump
164	83+000	R/S	Warning Sign	Petrol pump
165	83+180	L/S	Sign board	Gurudwara sahib
166	83+300	R/S	Warning Sign	Staggerd board
167	83+700	L/S	Warning Sign	Speed limit
168	83+650	L/S	Warning Sign	Danger sign
169	83+950	R/S	Warning Sign	Danger sign
170	84+000	R/S	Warning Sign	Speed limit
171	84+100	L/S	Village Sign board	Maur Mandi/Peerkot
172	84+300	R/S	Village Sign board	Maur Mandi/Peerkot
173	85+750	L/S	Warning Sign	Cross road
174	88+700	L/S	Village Sign board	Titarsar village
175	88+950	L/S	Warning Sign	School Sign board
176	88+970	R/S	Village Sign board	Titarsar village
177	90+800	L/S	Village Sign board	Maisarkhana village
178	91+600	L/S	Warning Sign	Railway station sign
179	91+750	R/S	Warning Sign	Railway station sign
180	91+780	R/S	Warning Sign	Speed Limit
181	92+500	L/S	Warning Sign	Petrol pump
182	92+700	R/S	Warning Sign	Petrol pump
183	93+650	L/S	Warning Sign	Speed Limit
184	93+700	L/S	Warning Sign	Danger sign
185	93+750	L/S	Warning Sign	Curve Portion
186	94+000	L/S	Warning Sign	Chevron Board on Curve Portion
187	94+450	R/S	Warning Sign	Danger sign
188	94+500	R/S	Warning Sign	Speed Limit
189	95+720	L/S	Warning Sign	Speed Limit
190	96+200	R/S	Warning Sign	Speed Limit
191	96+250	L/S	Warning Sign	Danger sign/Chevron boards (curve)
192	96+620	R/S	Warning Sign	Speed Limit
193	96+600	R/S	Warning Sign	Danger sign/Chevron boards (curve)
194	97+500	L/S	Warning Sign	Danger sign

195	97+500	L/S	Warning Sign	Speed limit/Chevron boards
196	98+050	R/S	Warning Sign	Danger sign
197	98+150	R/S	Warning Sign	Speed limit
198	100+600	R/S	Village Sign board	Ramgarh village
199	101+800	R/S	Village Sign board	Kotfatta village
200	107+750	L/S	Village Sign board	Kotshmir village
201	107+800	L/S	Warning Sign	Speed limit
202	108+700	Median	Warning Sign	Spring Post Delineator/Kerb Paint/ Blinking light (Intersection s-2 and b-8)

Table 3-3 : VERIFICATION INSPECTION AUDIT – SECTION S3

Section - S-3				
SI #	Chainage	Side	Road Warning/Informatory Guide Signs	Remarks
1	119+700	Center/ Median	Warning Sign	Spring post Delineator/Marking/ Kerb paint
2	119+700	L/S	Warning Sign	Petrol pump
3	119+900	R/S	Warning Sign	Petrol pump
4	120+200	L/S	Warning Sign	Speed Limit
5	120+550	L/S	Village Sign board	Mansa khurd village
6	120+750	R/S	Village Sign board	Mansa khurd village
7	121+300	R/S	Warning Sign	School Sign board
8	122+-	R/S	Warning Sign	School Sign board
9	123+000	L/S	Warning Sign	School Sign board
10	123+200	R/S	Warning Sign	School Sign board
11	122+900	L/S	Warning Sign	Speed Limit
12	123+300	Center/ Median	Warning Sign	Spring post Delineator/Marking/ Kerb paint
13	123+200 123+600	Center/ Median	Warning Sign	Chevron Marking
14	123+300	L/S	Warning Sign	Staggered board

Table 3-4 : VERIFICATION INSPECTION AUDIT – SECTION S4

Section - S-4				
SI #	Chainage	Side	Road Warning/Informatory Guide Signs	Remarks
1	0+050	L/S	Initial Board	OPRC Project
2	0+400	L/S	Warning Sign	Chevron boards
3	2+250	L/S	Village Sign board	Khokharkalan village
4	2+900	R/S	Warning Sign	Chevron boards
5	3+900	R/S	Warning Sign	Petrol pump
6	4+100	R/S	Warning Sign	Petrol pump
7	5+500	L/S	Warning Sign	Curve portion
8	5+800	R/S	Warning Sign	Curve portion
9	6+000	L/S	Warning Sign	Curve portion
10	11+850	R/S	Village Sign board	Talwandiakliya/makha
11	15+300	L/S	Warning Sign	Speed Breaker
12	15+400	L/S	Warning Sign	Speed Breaker
13	14+950	L/S	Warning Sign	Speed Limit
14	15+450	R/S	Warning Sign	Speed Limit
15	18+400	L/S	Warning Sign	Petrol pump
16	18+600	R/S	Warning Sign	Petrol pump
17	18+550	L/S	Warning Sign	Hospital sign
18	18+700	R/S	Warning Sign	Hospital sign
19	19+400	L/S	Warning Sign	Curve portion
20	19+380	L/S	Warning Sign	School sign board
21	19+650	R/S	Warning Sign	School sign board
22	20+750	L/S	Warning Sign	Curve portion
23	24+050	L/S	Warning Sign	Cross Road Sign
24	24+150	R/S	Warning Sign	Cross Road Sign
25	24+970	Center	Warning Sign	Implement with Blinking Light/Chevron Marking/Paint

Table 3-5 : VERIFICATION INSPECTION AUDIT – SECTION S5

Section - S-5				
SI #	Chainage	Side	Road Warning/Informatory Guide Signs	Remarks
1	0+700	R/S	Temple Sign board	Mahavir Temple
2	0+800	L/S	Village Sign board	Atter Singh wala/Kubbeloha khera
3	0+900	R/S	Village Sign board	Atter Singh wala/Kubbeloha khera
4	1+700	L/S	Village Sign board	Bungermander/Sahooke tadriyan
5	1+800	R/S	Village Sign board	Bungermander/Sahooke tadriyan
6	2+400	L/S	Village Sign board	Javandhapindi/dhanula
7	2+600	R/S	Village Sign board	Javandhapindi/dhanula
8	4+500	L/S	Warning Sign	Petrol pump
9	4+700	R/S	Warning Sign	Petrol pump
10	5+400	L/S	Village Sign board	Kale ke village
11	5+600	R/S	Village Sign board	Kale ke village
12	5+950	L/S	Village Sign board	Kale ke village
13	6+100	R/S	Village Sign board	Kale ke village
14	6+750	R/S	Warning Sign	Curve Portion
15	6+400	R/S	Warning Sign	Speed Limit
16	6+900	R/S	Warning Sign	Petrol pump
17	9+400	L/S	Village Sign board	Aspalkalan village
18	9+600	R/S	Village Sign board	Aspalkalan village
19	10+800	L/S	Warning Sign	Curve Portion
20	10+750	L/S	Warning Sign	Speed Limit
21	11+050	R/S	Warning Sign	Speed Limit
22	11+000	L/S	Village Sign board	Paine fatta village
23	11+160	R/S	Village Sign board	Paine fatta village
24	11+040	L/S	Village Sign board	Kotdhuna village
25	11+450	L/S	Warning Sign	Curve Portion
26	11+850	L/S	Village Sign board	Waheguru pura/kotesubedar walavillage
27	11+950	R/S	Village Sign board	Waheguru pura/kotesubedar walavillage
28	13+800	L/S	Warning Sign	Curve Portion
29	13+820	L/S	Warning Sign	Speed Limit
30	13+830	L/S	Warning Sign	No Overtaking
31	14+500	R/S	Warning Sign	Curve Portion
32	14+520	R/S	Warning Sign	No Overtaking



33	15+000	L/S	Village Sign board	Rajiyan/Taddriyan village
34	16+000	L/S	Village Sign board	Khiva/Pandher village
35	16+200	R/S	Village Sign board	Khiva/Pandher village
36	17+400	L/S	Village Sign board	Mojje/AlisherAtlan village
37	18+600	R/S	Village Sign board	Mojje/AlisherAtlan village
38	19+500	L/S	Village Sign board	Gurthadhi village
39	19+690	R/S	Village Sign board	Matti/Gurthadhi village
40	20+300	L/S	Village Sign board	Matti sign board
41	23+800	L/S	Village Sign board	Khiva kalan/Heron kalan village
42	23+900	R/S	Village Sign board	Khiva kalan/Heron kalan village
43	23+750	L/S	Warning Sign	Speed Limit
44	24+000	L/S	Village Sign board	At lakhurd village
45	24+100	R/S	Village Sign board	At lakhurd village
46	25+340	L/S	Warning Sign	Sunam/Mansa

Table 3-6 : VEIFICATION INSPECTION AUDIT – SECTION B8

Section - B-8				
SI #	Chainage	Side	Road Warning/Informatory Guide Signs	Remarks
1	9+200	Center/ Median	Warning Sign	Spring Post delineator
2	9+600	R/S	Warning Sign	Petrol pump Sign
3	9+200 to 14+700	Center	Warning Sign	Chevron marking in Gap
4	11+450	L/S	Village Sign board	Katarsinghwala /Gulabgargh/ Zebra Crossing with blinking light
5	11+500	R/S	Village Sign board	Katarsinghwala /Gulabgargh/ Zebra Crossing with blinking light
6	13+000	R/S	Warning Sign	School Sign board
7	13+500	R/S	Warning Sign	Curve portion
8	15+200	L/S	Warning Sign	School Sign board
9	15+150	L/S	Warning Sign	Curve portion
10	15+050	L/S	Warning Sign	Speed limit
11	15+350	R/S	Warning Sign	School Sign board
12	15+700	L/S	Warning Sign	Curve portion
13	16+250	L/S	Warning Sign	Curve portion
14	16+620	R/S	Warning Sign	Curve portion

15	16+900	R/S	Warning Sign	Speed limit
16	17+100	L/S	Warning Sign	Curve portion
17	17+400	R/S	Warning Sign	Curve portion
18	18+400	L/S	Village Sign board	Kale bandar Village
19	18+600	R/S	Village Sign board	Kale bandar Village
20	19+400	L/S	Warning Sign	Curve Sign /Chevron boards
21	19+700	R/S	Warning Sign	Curve Sign /Chevron boards
22	20+000	L/S	Warning Sign	Curve Sign /Chevron boards
23	20+500	R/S	Warning Sign	Curve Sign /Chevron boards
24	20+500	L/S	Warning Sign	Danger Sign
25	20+700	R/S	Warning Sign	Danger Sign
26	21+800	L/S	Warning Sign	Curve Sign /Chevron boards
27	22+100	R/S	Warning Sign	Curve Sign /Chevron boards
28	22+150	L/S	Village Sign board	Jivan sing wala/bhadde wala Village
29	22+250	R/S	Village Sign board	Jivan sing wala/bhadde wala Village
30	22+900	L/S	Warning Sign	Curve Sign /Chevron boards
31	23+650	L/S	Warning Sign	Curve Sign /Chevron boards
32	23+850	R/S	Warning Sign	Curve Sign /Chevron boards
33	24+800	L/S	Warning Sign	Curve Sign /Chevron boards
34	26+000	L/S	Warning Sign	Curve Sign /Chevron boards
35	26+350	R/S	Warning Sign	School Sign board
36	27+600	L/S	Warning Sign	Curve portion
37	28+800	L/S	Warning Sign	Curve portion
38	29+800	L/S	Warning Sign	Petrol pump Sign
39	30+700	Center/ Median	Warning Sign	Spring Post delineator/thermoplastic marking /kerb paint/Chevron marking (urban area)
40	30+800	Median	Warning Sign	Bollard board (2 no.)
41	31+000	Median	Warning Sign	Bollard board (2 no.)
42	31+200	Median	Warning Sign	Bollard board (2 no.)
43	31+300	L/S	Warning Sign	Petrol pump Sign
44	31+500	R/S	Warning Sign	Petrol pump Sign

45	31+350	Median	Warning Sign	Bollard board (2 no.)
46	31+450	Median	Warning Sign	Bollard board (2 no.)
47	31+550	Median	Warning Sign	Bollard board (1 no.)
48	31+850	Median	Warning Sign	Bollard board (2 no.)
49	32+680	L/S	Warning Sign	Island Rounabout
50	32+700	L/S	Village Sign board	Maur/Rama Mandi
51	32+750	Median	Warning Sign	Bollard board (2 no.)
52	32+900	R/S	Warning Sign	Island Rounabout
53	32+950	R/S	Warning Sign	Speed limit
54	32+850	Median	Warning Sign	Spring Post delineator/thermoplastic marking /kerb paint/Chevron marking (urban area)
55	33+600	L/S	Warning Sign	Petrol pump Sign
56	33+800	R/S	Warning Sign	Petrol pump Sign
57	34+750	R/S	Village Sign board	Gurusar/navasingh Village
58	34+650	L/S	Village Sign board	Gurusar/navasingh Village
59	38+000	L/S	City Name	Sardulgarh/Mansa
60	38+150	R/S	City Name	Talwandisaboo/Mansa

## 3.2 PHOTOGRAPHIC RECORD

### 3.2.1 PHOTOGRAPHIC RECORD – SECTION S1



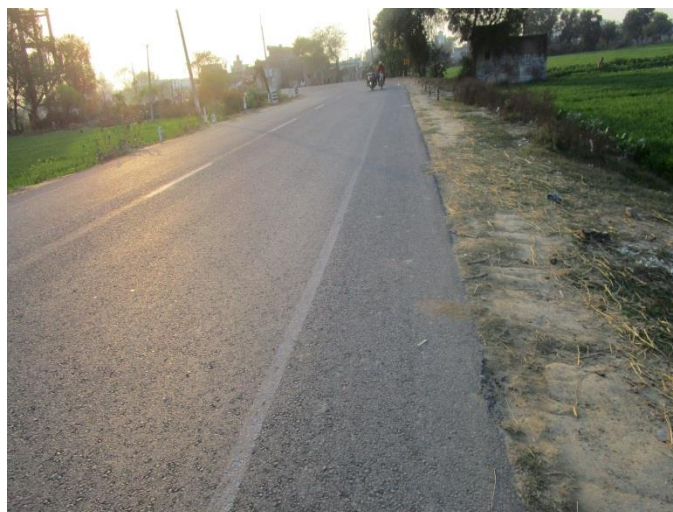
**1. Parapet wall not repaired and No whitewash.  
S – 1 (0+120 R.H.S).**



**2. Worn out pavement marking  
S – 1 (0+150 to 0+300 B.H.S).**



**3. Worn out pavement marking  
S-1 (9+355 B.H.S)**



**4. Worn out pavement marking  
S-1 (9+577 B.H.S)**





**5. Deck slab not clean  
S-1 (10+325 B.H.S)**



**6. Cat Type, Solar Type or Delineators to be provided  
S-1 (10+325 B.H.S)**



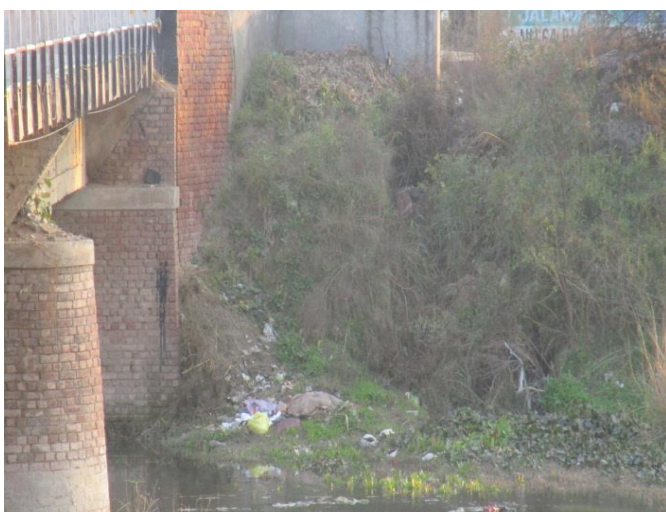
**7. Wild vegetation growing and obstruction of flow water.  
S-1 (10+325 L.H.S)**



**8. Potholes on the existing Surface  
S-1 (10+325 L.H.S)**



**9. Wild vegetation growing  
S-1 (10+325 L.H.S)**



**10. Wild vegetation growing  
S-1 (10+325 R.H.S)**



**11. Wild vegetation growing  
S-1 (10+325 R.H.S)**

#### **GENERAL INFORMATION SECTION S1 (REHABILITATION)**

<b>Road Section</b>	:	Sangrur-Sunam (MDR-21)
<b>Total Length</b>	:	(11+300 Km)
<b>Completed work</b>	:	Nil
<b>Uncompleted work</b>	:	Due to dispute of Pavement Design and the case is with DRB.



### CRITICAL TECHNICAL OBSERVATIONS/COMMENTS - SECTION S1

1. The culvert parapet wall has been found damaged and needs repair/rectifications and no white wash is done. (Photo-1)
2. The pavement marking has faded and not clearly indicating the lane width and direction through the length of road Sections.(Photo-2)
3. The pavement marking has faded and not clearly indicating the lane width and direction through the length of road Sections. (Photo-3)
4. The pavement marking has faded and not clearly indicating the lane width and direction through the length of road Sections. (Photo-4)
5. Repairing work is required on deck slab. (Photo-5).
6. At the intersection the channelization of traffic is in the risk of accidents due to non-provision of the Delineators and Zebra-crossing etc. (Photo-6)
7. Obstruction in flow of water caused hydrodynamic effect in any rainy season will cause cracks in piers. (Photo-7)
8. Filling potholes with premix material or penetration patching. (Photo-8)
9. Filling potholes with premix material or penetration patching. (Photo-9)
10. Wild vegetation at Abutment portion is not removed. (Photo-10)
11. Wild vegetation at Abutment portion is not removed. (Photo-11)

### 3.2.2 PHOTOGRAPHIC RECORD – SECTION 2



**1. Solar Type or Delineators to be provided  
S-2 (27+200)**



**2.Solar Type or Delineators to be provided  
S-2 (27+400)**



**3. Solar Type or Delineators to be provided  
S-2 (27+600)**



**4. Deficient thickness of PCC bed.  
S-2 (39+250 L.H.S)**



**5. Rectification work for proper thickness.  
S-2 (39+250 L.H.S)**





**6. Prepared bed for PCC.  
S-2 (39+250 R.H.S)**



**7. Rectification work for proper thickness  
S-2 (39+250 R.H.S)**



**8. Drainage Water Adjoining Pavement Edge  
S-2 (42+200 R.H.S)**



**9. Brickwork Abutment  
S-2 (44+520 B.H)**





**10. Disposal Material  
(S-2 44+520 L.H.S)**



**11. Brick work for Abutment wall in progress  
S-2 (44+520 L.H.S)**



**12. Development of Cracks  
S-2 (44+520 R.H.S)**



**13. Low Level Pavement Shoulder  
S-2 (45+400 L.H.S)**



**14. Drainage Water Adjoining Pavement Edge  
S-2 (55+200 L.H.S)**



**15. S2 and B8 intersection for safety reasons  
S-2 (106+130 R.H.S)**



**16. Slippage approaches ( intersection of B8 and S2 )  
S-2 (106+130 R.H.S)**



## GENERAL INFORMATION SECTION S2 (IMPROVEMENT)

**Road Section** : Bhawanigarh-Sunam-Bhikhi-Kotshamir (State Highway-12A)

**Total Length** : (106+130 Km)

**Completed work** : Nil

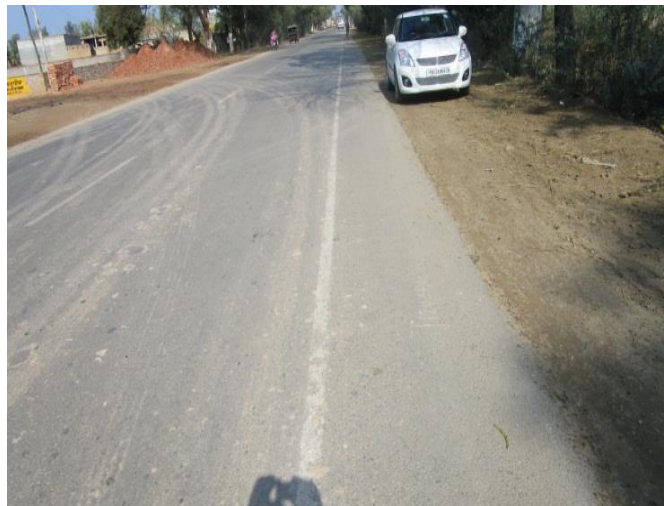
**Uncompleted work** : The work is held up due to Non-Clearance of Forest.

## CRITICAL TECHNICAL OBSERVATIONS/COMMENTS - SECTION S2

1. At the intersection the channelization of traffic is in the risk of accidents due to non-provision of the Delineators and Zebra-crossing etc. (Photo-1)
2. At the intersection the channelization of traffic is in the risk of accidents due to non-provision of the Delineators and Zebra-crossing etc. (Photo-2)
3. At the intersection the channelization of traffic is in the risk of accidents due to non-provision of the Delineators and Zebra-crossing etc. (Photo-3)
4. PCC thickness has not done as shown in drawing given by agency. (Photo-4)
5. Excavating and levelling of bed for PCC work rectification at required thickness. (Photo-5)
6. Preparing the bed by the process of hammering to get hard bed in culvert part. (Photo-6)
7. Excavating and levelling of bed for PCC work rectification at required thickness. (Photo-7)
8. The overflowing of the water from the culvert due to culvert choking was found stagnant on the road pavement edge damaging road pavement. (Photo-8)
9. Brickwork Abutment work is in regular progressive manner. (Photo-9)
10. The waste material was dumped on the shoulder at chainage of road section S – 2. (Photo-10)
11. Brick work for abutment wall in progress. (Photo-11)
12. The initiation of cracks yet started at place due to segregation and poor compaction of the B.T surface. (Photo-12)
13. Earthen shoulder is not properly maintained with 3% camber and level of earthen shoulder is much lower than the pavement edges. (Photo-13)
14. The overflowing of the water from the culvert due to culvert choking was found stagnant on the road pavement edge damaging road pavement. (Photo-14)
15. No Implementation of safety equipment at intersection(S-2 & B-8), according To IRC 67 and IRC 35. (Photo-15)
16. Unusual thrust of wheels in a direction, lack of failure of bond surface and lower pavement courses results in slippage. (Photo-16)



### 3.2.3 PHOTOGRAPHIC RECORD- SECTION S3



**1. Worn out pavement marking  
S-3 (120+400 B.H.S)**



**2. Drainage water adjoining pavement edge  
S-3 (125+200 L.H.S)**



**3. No Culvert marking  
S-3 (125+600 B.H.S)**

### GENERAL INFORMATION SECTION S3 (REHABILITATION)

<b>Road Section</b>	:	Barnala-Mansa Road (upto Ram Diteywalachowk)
		(State Highway-13)
<b>Total Length</b>	:	(7+290 Km)
<b>Completed work</b>	:	Nil
<b>Uncompleted work</b>	:	The work is held up due to variation part of agreement of four lanes.

### CRITICAL TECHNICAL OBSERVATIONS/COMMENTS - SECTION S3

1. The pavement marking has faded and not clearly indicating the lane width and direction through the length of road Sections. (Photo 1)
2. The overflowing of the water from the culvert due to culvert choking was found stagnant on the road pavement edge damaging road pavement.(Photo 2)
3. The culverts at places have been found without culvert marking for road safety. (Photo 3)

#### 3.2.4 PHOTOGRAPHIC RECORD - SECTION S4



**1. Paved Shoulder is not clean  
S-4 (23+170 R.H.S)**



**2. S4 and B8 intersection**



**3. S4 and B8 intersection**



**4. S4 and B8 intersection**



**5. S4 and B8 intersection**



#### GENERAL INFORMATION SECTION S4 (IMPROVEMENT)

<b>Road Section</b>	:	Mansa-Talwandi Sabo Up to intersection with B8 (SH17)
<b>Total Length</b>	:	(24+970 Km)
<b>Existing Road width</b>	:	5.5 m
<b>Widening</b>	:	4.5 m
<b>Total width proposed</b>	:	10 m
<b>Completed work</b>	:	(24+470 Km)
<b>Uncompleted work</b>	:	(0+500 Km)

#### CRITICAL TECHNICAL OBSERVATIONS/COMMENTS - SECTION S4

1. The pavement shoulder is not cleaned, broomer is must be applied for cleaning the paved shoulder. (Photo 1)
2. No Implementation of safety equipment at intersection(S-4 & B-8), according To IRC 67 and IRC 35. (Photo 2)
3. No Implementation of safety equipment at intersection(S-4 & B-8) according To IRC 67 and IRC 35. (Photo 3)
4. No Implementation of safety equipment at intersection(S-4 & B-8), according To IRC 67 and IRC 35. (Photo 4)
5. No Implementation of safety equipment at intersection(S-4 & B-8), according To IRC 67 and IRC 35. (Photo 5)

### 3.2.5 PHOTOGRAPHIC RECORD - SECTION S5



**1. Soil Dumping for Earthen shoulder preparation  
S-5 (2+220 R.H.S)**



**2. Soil Dumping for Earthen shoulder preparation  
S-5 (2+400 L.H.S)**



**3. Soil Dumping for Earthen Shoulder preparation  
S-5(4+500 R.H.S)**



**4. Parapet wall not repaired and No white wash  
S-5( 6+080 R.H.S)**



**5. Drainage Water Adjoining to Pavement Edge  
S-5 (24+200 L.H.S)**



**6.Worn out pavement marking  
S-5 (25+000)**

#### **GENERAL INFORMATION SECTION S5 (REHABILITATION)**

<b>Road Section</b>	:	Dhanaula-Bhikhi Road (MDR)
<b>Total Length</b>	:	(25+340 Km)
<b>Completed work</b>	:	Total length
<b>Uncompleted work</b>	:	Nil

#### **CRITICAL TECHNICAL OBSERVATIONS/COMMENTS - SECTION S5**

1. Soil is dumped for the preparation of Earthen Shoulder.(Photo-1)
2. Soil is dumped for the preparation of Earthen Shoulder. (Photo-2)
3. Soil is dumped for the preparation of Earthen Shoulder. (Photo-3)
4. The culvert parapet wall has been found damaged and needs repair/rectifications and no white wash has done.(Photo-4)
5. The overflowing of the water from the culvert due to culvert choking was found stagnant on the road pavement edge damaging road pavement. (Photo-5)
6. The pavement marking has faded and not clearly indicating the lane width and direction through the length of road Sections. (Photo-6)

**S-5 (shoulder soil):-**The soil being used in S-5 shoulder construction from a borrowed area is to be confirmed whether it has been transported from approved source having CBR 7% and MDD 97%. The contractor is not authorized for its use without testing of soil and results submitted to the Monitoring consultant till that time the work for the same should be withheld.

The above work should only be carried to the technical requirement of the borrowed soil as per contract standards and specifications (clause 5.9, 5.3).



### 3.2.6 PHOTOGRAPHIC RECORD - SECTION B8



**1. Slippage**  
**B-8 (14+900 R.H.S)**



**2. Low Level Pavement Shoulder**  
**B-8 (15+100 R.H.S)**



**3. Core Cutting in Progress**  
**B-8 (15+140 R.H.S )**



**4. BC core thickness  
B-8 (15+140 R.H.S)**



**5. BC core thickness  
B-8 (15+140 R.H.S)**

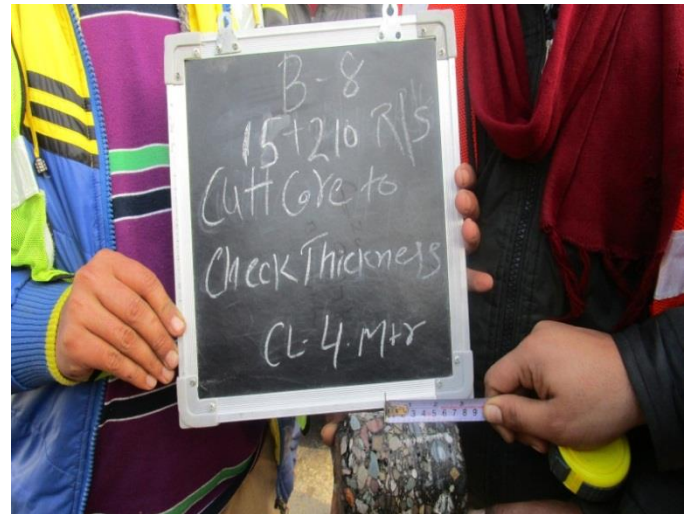


**6. Core Cutting in Progress  
B-8 (15+210 R.H.S)**





7. BC core thickness  
B-8 (15+210 R.H.S)



8. BC core thickness  
B-8 (15+210 R.H.S)



9. Hand Railing Damaged  
B-8 (20+640 R.H.S)



**10. Low Level Pavement Shoulder  
B-8 (22+000 R.H.S)**



**11. Low Level Pavement Shoulder  
B-8 (22+100 R.H.S)**



**12. Core Cutting in Progress  
B-8 (23+890 L.H.S. )**



**13. BC core thickness  
B-8 (23+890 L.H.S)**





**14. BC core thickness  
B-8 (23+890 L.H.S)**



**15. Core Cutting in Progress  
B-8 (27+030 L.H.S)**



**16. BC core thickness  
B-8 (27+030 L.H.S)**



**17. The core found damaged during contraction  
B-8 (27+030 L.H.S)**



**18. No pavement marking  
B-8 (30 to 32 Km L.H.S)**



**19. No hazard board  
B-8 (37+200 culvert L.H.S)**



**20. Low Level Pavement Shoulder  
B-8(37+840 L.H.S)**



## GENERAL INFORMATION SECTION B8 (REHABILITATION)

<b>Road Section</b>	:	Bathinda-Kotshamir-Talwandi Sabo (up to intersection with S4) (ODR)
<b>Total Length</b>	:	(28+650 Km)
<b>Completed work</b>	:	Total Length
<b>Uncompleted work</b>	:	Nil

## CRITICAL TECHNICAL OBSERVATIONS/COMMENTS - SECTION B8

1. Unusual thrust of wheels in a direction, lack of failure of bond surface and lower pavement courses results in slippage. (Photo 1)
2. Earthen shoulder is not properly maintained with 3% camber and level of earthen shoulder is much lower than the pavement edges. (Photo 2)
3. The core cutting for investigation of Bitumen content, gradation and layer thickness was carried out. (Photo 3)
4. The thickness of BC layer appears to be non-conforming to the pavement design specifications. (Photo 4)
5. The core cutting for investigation of Bitumen content, gradation and layer thickness was carried out. (Photo 5)
6. Core cutting in progress. (PHOTO 6)
7. The core cutting for investigation of Bitumen content, gradation and layer thickness was carried out. (Photo 7)
8. The core cutting for investigation of Bitumen content, gradation and layer thickness was carried out. (Photo 8)
9. Hand Railing Damaged. (Photo 9)
10. Earthen shoulder is not properly maintained with 3% camber and level of earthen shoulder is much lower than the pavement edges. (Photo 10)
11. Earthen shoulder is not properly maintained with 3% camber and level of earthen shoulder is much lower than the pavement edges. (Photo 11)
12. Core cutting in progress. (Photo 12)
13. The core cutting for investigation of Bitumen content, gradation and layer thickness was carried out. (Photo 13).
14. The thickness of the core found ok. (Photo 14).
15. Core cutting in progress. (Photo 15).
16. The core cutting for investigation of Bitumen content, gradation and layer thickness

was carried out. (Photo 16).

17. The core cutting for investigation of Bitumen content, gradation and layer thickness was carried out. (Photo 17).
18. Pavement marking work must be required at B.H.S to show the end visibility. (Photo 18).
19. The culverts at places have been found without culvert sign boards for road safety. (Photo 19).
20. Earthen shoulder is not properly maintained with 3% camber and level of earthen shoulder is much lower than the pavement edges. (Photo 20).

### 3.3 QC TASKS UNDERTAKEN & REPORTED BY THE CONTRACTOR

The following table summarizes the QC tasks undertaken and reported by the Contractor pertaining to the month of December, 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 3-7 : QC tasks undertaken & reported by the Contractor - December, 2014

Cube Test Results Summary ( Compressive Strength )						
Sl. #	Date of Casting	Description/Chainage	Grade of Concrete	Average Compressive Strength N/mm <sup>2</sup> 7 Days	Average Compressive Strength N/mm <sup>2</sup> 28 Days	Remarks
1	06.12.14	20+825 BS- Pcc for Abutment	M-15	12.3	20	
2	07.12.14	20+825 BS- Bed Block	M-25	18.37	29.48	
3	08.12.14	20+825 BS- SlabM-	M-30	26.22	38.52	
4	08.12.14	49+300 BS- Pcc for Abutment	M-15	11.85	19.71	
5	11.12.14	59+810 RS- Pcc for Abutment	M-15	12.3	20	
6	13.12.14	59+810 LS- Pcc for Abutment	M-15	12.29	19.85	
7	14.12.14	59+810 RS- Bed Block	M-25	19.11	27.56	
8	16.12.14	59.810 RS- Slab	M-30	25.48	35.26	
9	16.12.14	59+810 LS- Bed Block	M- 25	19.11	29.48	
10	18.12.14	59+810 LS- Slab	M-30	24.74	35.7	
11	21.12.14	17+635 RS- Pcc for Return Wall	M-15	12.89	18.67	
12	22.12.15	17+635 BS- Pcc for Abutment- A2	M-15	12.59	19.11	
		21+420 LS- Pcc for Abutment- A2				
		21+425 LS-Pcc for ReturnWall - A2				
		17+635 BS- Pcc for Abutment - A1				
13	23.12.14	21+420 LS- Pcc for Abutment -A1	M-15	12.44	20.59	
		21+420 LS- Pcc for Return Wall- A1				
14	23.12.14	17+635 RS- Bed Block	M-25	20	27.41	
15	24.12.14	17+635 LS- Bed Block	M-25	19.7	28.74	

		21+425 RS- Bed Block				
16	24.12.14	21+425 RS- pcc for Abutment A2	M-15	11.11	19.55	
		21+425 RS- pcc for Return Wall- A2				
17	25.12.15	21.420 RS- Pcc for Abutment-A1	M-15	12.59	19.41	
		21+420 RS- Pcc for Return Wall- A1				
18	26.12.14	17+635 RS- Slab	M-30	24.15	38.08	
19	27.12.14	17.635 LS- Slab	M-30	25.19	37.33	
20	28.12.14	21+420 LS- Bed Block	M-25	19.41	27.85	
		21+420 RS- Bed block				
21	30.12.15	21+420 LS- Slab	M-30	25.93	38.07	
22	31.12.15	21.420 RS- Slab	M-30	27.11	37.78	
23	02.01.15	51.190 RS- HW- IInd Lift	M-15	13.33	19.85	
		51+040 RS- HW- Ist Lift				
		51+040 RS- Pipe Bed Pcc				
24	03.01.15	51+190 LS- HW- IInd Lift	M-15	12.74	19.85	
		51+190 RS- HW-IIIrd Lift				
25	04.01.15	51+190 LS- HW- IIIrd & 4th lift	M-15	12.15	20	
		51.040 LS- HW- IInd Lift & Pipe Bed pcc				
26	05.01.15	51.040 LS- HW- IIIrd& 4th Lift	M-15	12.44	19.7	
27	06.01.15	51.040 RS- HW- IInd& 3rd Lift	M-15	12.89	20	
		51+370 LS- Pcc for Abutment				
28	07.01.15	51+040 RS- HW- 4th Lift	M-15	13.48	19.85	

**Table 3-8 : Summary Test Results OGL & Shoulder (S2)**

Summary Test Results OGL & Shoulder (S2)												
Sl. #	Chainage	Side		MDD (gm/cc)	OMC (%)	CBR (%)	Liquid Limit(%)	Plasticity Index(%)	FSI (%)	G.S.A %		
										Gravel (19- 4.75)	Sand (4.75- 0.075)	Silt & Clay ( 0.075 MM Passing
1	79+250	LS	Shoulder	1.880	9.70	11.44	24.20	-	5.00	0.86	50.27	48.87
2	79+250	LS	OGL	1.912	9.20	12.65	23.00	-	-	1.39	54.83	43.78
7	80+000	RS	Shoulder	1.864	9.60	13.87	22.70	-	-	1.37	59.16	39.47
8	80+000	RS	OGL	1.892	10.10	11.68	23.40	-	-	1.06	52.19	46.75
15	81+000	RS	Shoulder	1.860	10.2	13.63	22.6	-	-	0.31	57.72	41.97
16	81+000	RS	OGL	1.903	9.2	12.01	23.8	-	-	0.38	50.11	49.51
25	82+250	LS	Shoulder	1.891	10.20	12.49	22.00	-	-	0.93	57.1	41.97
26	82+250	LS	OGL	1.912	9.60	13.14	22.20	-	-	0.63	55.7	43.67
31	83+000	RS	Shoulder	1.914	8.80	14.28	24.10	-	-	1.3	55.03	43.67
32	83+000	RS	OGL	1.901	9.60	13.22	23.80	-	-	1.08	45.74	53.18
39	84+000	RS	Shoulder	1.901	9.60	12.25	23.30	-	-	1.27	49.2	49.53
40	84+000	RS	OGL	1.893	9.50	14.27	24.00	-	-	1.59	50.59	47.82
47	85+000	RS	OGL	1.858	9.80	14.36	20.60	-	-	0.04	62.74	37.22
48	85+000	RS	Shoulder	1.875	9.60	14.52	21.80	-	-	0.19	45.99	53.82
57	86+250	LS	OGL	1.858	9.80	14.76	23.00	-	-	0.24	56.41	43.35
58	86+250	LS	Shoulder	1.864	10.10	14.93	23.50	-	-	0.23	61.38	38.39
73	88+250	LS	Shoulder	1.832	10.00	13.71	23.70	-	-	0.21	63.2	36.59
74	88+250	LS	OGL	1.818	9.70	14.19	24.20	-	-	0.49	58.77	40.74
81	89+250	LS	Shoulder	1.858	10.10	14.36	23.50	-	-	1.38	55.63	42.99
82	89+250	LS	OGL	1.790	9.80	14.60	23.20	-	-	0.89	62.14	36.97
87	90+000	RS	Shoulder	1.806	10.20	14.36	23.00	-	-	0.7	57.38	41.92
88	90+000	RS	OGL	1.787	9.70	14.19	22.80	-	-	0.31	55.46	44.23
97	91+250	LS	Shoulder	1.915	9.20	15.17	23.40	-	-	0.56	53.78	45.66
98	91+250	LS	OGL	1.859	10.20	15.09	20.60	-	-	0.18	57.42	42.4
105	92+250	LS	Shoulder	1.872	9.80	14.84	23.50	-	-	0.85	57.36	41.79
106	92+250	LS	OGL	1.860	10.10	13.63	24.00	-	-	0.79	55.43	43.78
111	93+000	RS	Shoulder	1.876	9.70	14.76	23.40	-	-	0.67	59.36	39.97
112	93+000	RS	OGL	1.864	10.00	12.73	24.00	-	-	0.57	58.2	41.23
119	94+000	RS	Shoulder	1.903	9.80	14.60	22.80	-	-	0.79	60.24	38.97
120	94+000	RS	OGL	1.870	9.60	14.03	23.50	-	-	1.23	53.91	44.86
129	95+250	LS	Shoulder	1.886	10.10	13.38	23.50	-	-	0.22	59.85	39.93
130	95+250	LS	OGL	1.857	10.20	13.95	23.70	-	-	0.32	67.58	32.1
137	96+250	LS	Shoulder	1.881	9.80	12.98	23.00	-	-	1.02	59.86	39.12
138	96+250	LS	OGL	1.860	10.20	13.06	23.70	-	-	0.79	57.23	41.98
143	97+000	RS	Shoulder	1.870	9.00	13.22	23.50	-	-	0.67	61.7	37.63

144	97+000	RS	OGL	1.848	9.90	12.73	24.00	-	-	0.57	57.46	41.97
151	98+000	RS	OGL	1.850	10.00		23.50	-	-	0.54	63.41	36.05
152	98+000	RS	Shoulder	1.876	9.80		23.00	-	-	0.7	64.17	35.13
161	99+250	LS	Shoulder	1.892	9.70		23.60	-	-	1.02	55.23	43.75
162	99+250	LS	OGL	1.870	9.80		23.00	-	-	0.63	59.54	39.83
167	100+000	RS	Shoulder	1.860	9.70		23.10	-	-	0.78	59.25	39.97
168	100+000	RS	OGL	1.832	10.10		23.50	-	-	0.62	56.83	42.55



## 4 PAYMENTS& DISPUTES

This Chapter describes the recommendation from Monitoring Consultant regarding to approve of the Contractor's next payment corresponding to the Month December, 2014. This Chapter also included a description of the Claims submitted by the Contractor to the Client.

### 4.1 CONTRACTOR'S PAYMENT – MONTH OF DECEMBER

The Monitoring Consultant recommend use of below table for calculate the value of the Contractor's payment corresponding to the Month December, 2014, which summary the Monthly Contract Non-Conformance Score, with base of the detail scores of NON-CONFORMANCES included in the Subchapter 2.3.

Therefore according to Chapter 18 of the Contract Agreement, it is recommending to use the percent achieved by the Contractor for the payment of the Month December 2014 that is 90.27 % corresponding to 185 NON-CONFORMANCES (Sub Chapter 18.5).

Table 4-1 : Monthly Contract Non-Conformance Score

Refer Not Above	Non-Conformance	Number of Non-Conformances A	Multiplication Factor		Score A*B*C
			Weighting B	Sub Weighting C	
A	RDPM Non-Conformance	-	-	-	-
B	MPM-1 Quality Assurance System	2	2	4	16
C	RUS & CPM-1 Pavement Maintenance	3	2	1	6
D	RUS & CPM-2 Unsealed Shoulder Maintenance	47	1	1	47
E	RUS & CPM-3 Drainage Maintenance	7	2	1	14
F	RUS & CPM-4 Routine Maintenance of Bridges & Other Structures	1	2	1	2
G	RUS & CPM-5 Obstructions on the Pavement Surface and Shoulders	1	1	1	1
H	RUS & CPM-6 Incident Response & Emergency Works Response	0	2	1	0
I	RUS & CPM-7 Vegetation control	0	1	1	0
J	RUS & CPM-8 Road Signs Maintenance	14	2	1	28
K	RUS & CPM-9 Raised Pavement Markers	0	2	1	0
L	RUS & CPM-10 Pavement Marking	0	2	1	0
M	RUS & CPM-11 Traffic Island and Roundabout Maintenance	7	1	1	7
N	RUS & CPM-12 Crash Barrier Maintenance	0	1	1	0
O	RUS & CPM-13 Sight Rail, Hand Rail and Pedestrian Barrier Maintenance	0	1	1	0
P	RUS & CPM-14 Marker Post Maintenance	2	2	1	4
Q	Repeated Non-Conformance in Consecutive Months				60
R	Any Employer or Monitoring Consultant generated Non-Conformance				0
S	Any Immediate Safety Hazard to Road Users Instructed for Repair				0
Monthly Aggregated Contract Non-Conformance score					<b>185</b>

## 4.2 DISPUTES & CLAIMS

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 Board (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.

### 4.2.1 CLAIM 1

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 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.
- 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).
- The DRB therefore recommends 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.

### 4.2.2 CLAIM 2

The Claim No 2 correspond to the Claim submitted for the contractor corresponding mainly to the Section S1. The Contractor requests the following:

8. 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
9. 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.
10. 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.
11. The Contractor's convention is completely unjust and is not in accordance with the contract and is, therefore, liable to be rejected.

12. 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
13. However, Bidders shall ensure that wherein asphaltic cement overlay treatment is proposed over any existing bituminous surfacing that is already cracked that the thickness of the new surfacing layer shall be greater than 175mm to mitigate the risk of reflective cracking under Clause 5.5.

After the review of the technical documents and of the Pavement Design of the Section S1, the Monitoring Consultant recommends on November 2014 accept the Pavement Design submitted by the Contractor with foundation in Non-Conventional Methods.

Finally the DRB recommendation dated 10th January 2015 is as under:

- The Claimant is not bound to execute the work as per minimum design solutions mentioned in Clause 5.5 of the Contract.
- The Contractor is entitled to execute the work as per its own pavement design as long as the said design meets the specific design criteria mentioned in Clause 5.8 of the Contract.
- All pending payments on this account should be released by the Respondent forthwith.

### 4.3 SUMMARY MAN-HOURS - MONITORING CONSULTANT

This Sub Chapter includes a Summary of inputs of the Monitoring Consultant in terms of man – hours for all members of the Monitoring Consultant’s Team during the Month December 2014.

Table 4-2 : MAN HOURS – KEY EXPERTS

Sl.No.	EMPLOYEE NAME	DESIGNATION	MAN HOURS IN HOME OFFICE	MAN HOURS ON FIELD	TOTAL MAN HOURS
1	Wilson Perez	Team Leader/Project Manager	112	40	152
2	Sohan Singh Seehra	Pavement Design Specialist	32	40	72
3	Vinay Maitri	Data Analyst/Statistician	-	-	-
4	Amar Sarkar	Environmental Specialist	-	-	-
5	Vinod Kumar	Asset Manager	32	8	40
<b>TOTAL -A</b>			<b>176</b>	<b>88</b>	<b>264</b>

Table 4-3 : MAN HOURS – NON KEY EXPERTS

Sl.No.	EMPLOYEE NAME	DESIGNATION	MAN HOURS IN HOME OFFICE	MAN HOURS ON FIELD	TOTAL MAN HOURS
1	Inderjeet Saini	Project Engineer	136	72	208
2	Varinder Singh	CAD Expert/Land Surveyor	176	32	208
3	Vijay Kumar	AM- Accounts/Administrator	208	-	208
4	Deep Singh	Secretary/Assistant	208	-	208
5	Shivam Kumar	Head Clerk	208	-	208
<b>TOTAL-B</b>			<b>936</b>	<b>104</b>	<b>1,040</b>
<b>GRAND TOTAL (A+B)</b>			<b>1,112</b>	<b>192</b>	<b>1,304</b>

**Note: Only actual working days has included in man hours,Holiday's has not considered.**

## 5 APPENDIX

### 5.1 MINUTES OF MEETING

#### 5.1.1 COMMENTS ON MEETINGS HELD ON 20-12-2015

1. Contractor is ordered after discussing with employer and MC to produce R.D. work marking along sides of road.
2. Contractor has ordered and his acceptance to produce MPR in new modified pattern as mentioned in agreement with 26<sup>th</sup> audit length (Network Performance monthly).
3. Discussion has done on removal of trees and branches on shoulder part; coordination with forest department is in under process for clearance.
4. Third year programme of roads S1,S2,S3 (Chainage Km45 to Km67) is in continuation process and likely to be finished by the Agency PIPL.
5. Deflection data and roughness measure work (IRI) report of road S2 (Chainage Km2+240 to Km19+400) and next (Chainage Km68 to Km79), thereafter in S5 (Chainage Km 0+00 to Km 24+340), S4 and B8, is under progress, delay is going on due to breakdown of advanced equipment ROMDAS (software system etc.).
6. In road asset works, rectification works are under progress as ordered by Employer and Monitoring Consultant.
7. The agency has ordered to follow safety norms during the construction of pavement, repairing of small structures, and hot plant operation, WMM plant operation.
8. As built Drawing will be submitted as instruction was given to contractor in forthcoming day in the month Dec.2014.
9. CQAMP of third year work programme, the contractor has promised to submit his quality assurance programme up to 5th Jan.2015.
10. Visual Inspection for culvert and other structures related to roads is fixed on date 24th,26th,27<sup>th</sup> of Dec.2014.
11. Visiting of Black Spot in all roads, jointly with Employer, Monitoring Consultant and Agency representatives will be fixed in forthcoming days.

#### 5.1.2 COMMENTS ON MEETINGS HELD ON 07-01-2015

1. Contractor has ordered to apply new Performa according to contract agreement page no.346 to enhance from previous pattern submitted by him, about CONFORMANCES and NON-CONFORMANCES of the roads to attach in record in monthly progress report.
2. Decision is taken to check quality work of black top of pavement surface (DBM&BC) in road B8.
3. Decision is taken to apply the Management Performance Measures (MPM) according to contract agreement, ordered to contractor.



4. After discussion on bill, contractor has to submit all certificate concerning with IPC-17 submitted by contractor.
5. Contractor is ordered to submit the mix design details regarding DBM & BC for review and analysis purpose.

## 5.2 CORRESPONDENCE SENT

Table 5-1 : Correspondence Sent

SI #	DISPATCHED DATE	FILE NAME	SUBJECT	SENT BY	SENT TO
1	5/11/2014	TNM/SNG/001	Request for submission of required data of OPRC project	Team Leader	Patel infra. Pvt. Ltd.
2	11/11/2014	TNM/SNG/002	Response to contractor's claim NO-2	Team Leader	PWD
3	23/11/2014	TNM/SNG/003	Reply to Memo No, 7220- Unsatisfactory Performance	Team Leader	PRBDB
4	27/11/2014	TNM/SNG/004	Audit section for the month of Nov-2014	Inderjeet Saini	Patel infra. Pvt. Ltd.
5	24/11/2014	TNM/SNG/005	Request for Logistic	Team Leader	Patel infra. Pvt. Ltd.
6	26/11/2014	TNM/SNG/006	Activities of Monitoring consultant	Team Leader	PWD
7	28/11/2014	TNM/SNG/007	Regarding Road safety on Sangrur sunam (S1) road	Inderjeet Saini	Patel infra. Pvt. Ltd.
8	28/11/2014	TNM/SNG/008	Data Requirement	Team Leader	Patel infra. Pvt. Ltd.
9	2/12/2014	TNM/SNG/009A	Need of preparation of preparation of earthen shoulder on Road (B-8)	Inderjeet Saini	Patel infra. Pvt. Ltd.
10	27/11/2014	TNM/SNG/009	Inspection Report	Inderjeet Saini	PWD
11	2/12/2014	TNM/SNG/0010	Regarding Road safety on Sangrur sunam (S1 , 9+000 to 10+000) road	Inderjeet Saini	Patel infra. Pvt. Ltd.
12	3/12/2014	TNM/SNG/0012	Request for providing the distributive number, reference number and canal number for the channels	Inderjeet Saini	Patel infra. Pvt. Ltd.
13	10/12/2014	TNM/SNG/0013	Instruction given to R D marking work of road S-1, S-2, S-3, S-4, S-5 and B-8 in all the sections	Inderjeet Saini	Patel infra. Pvt. Ltd.
14	10/12/2014	TNM/SNG/0014	Audit section for the month of Nov-2014	Inderjeet Saini	Patel infra. Pvt. Ltd.

15	11/12/2014	TNM/SNG/0015	Unavailability of office equipment's at the Monitoring Consultant's office	Vijay Sir	PWD
16	13/12/2014	TNM/SNG/0016	Regarding in principle approval of 'S-curve' on S2 road.	Inderjeet Saini	Patel infra. Pvt. Ltd.
17	13/12/2014	TNM/SNG/0017	Regarding in principle approval of S3.	Inderjeet Saini	Patel infra. Pvt. Ltd.
18	13/12/2014	TNM/SNG/0018	Regarding in principle approval of Mansa.	Inderjeet Saini	Patel infra. Pvt. Ltd.
19	14/12/2014	TNM/SNG/0019	Meeting Schedule	Team Leader	Patel infra. Pvt. Ltd.
20	15/12/2014	TNM/SNG/0020	Night Inspection	Team Leader	Patel infra. Pvt. Ltd.
21	15/12/2014	TNM/SNG/0021	Regarding meeting for review the work progress.	S.S Misra	Patel infra. Pvt. Ltd.
22	16/12/2014	TNM/SNG/0023	Inception Cum Monthly Progress Report	Team Leader	PWD
23	17/12/2014	TNM/SNG/0024	Regarding meeting with officials of forest depart for cutting of trees	S.S Misra	PWD
24	17/12/2014	TNM/SNG/0025	Construction of 600 mm dia Hume pipe culvert on BSBK km chainage 57+030	S.S Misra	Patel infra. Pvt. Ltd.
25	19/12/2014	TNM/SNG/0027	Regarding visit to Columbia.	Team Leader	PWD
26	18/12/2014	TNM/SNG/0027 A	Regarding taking decisions for culvert works in S2 road for canal.	S.S Misra	PWD
27	27/12/2014	TNM/SNG/0028	Regarding to take decisions on repairing or new construction about damage railing of bridge	S.S Misra	PWD
28	27/12/2014	TNM/SNG/0029	Audit section for the month of December-2014	Inderjeet Saini	Patel infra. Pvt. Ltd.
29	27/12/2014	TNM/SNG/0030	Correction in IPC-17	Vinod Kumar	Patel infra. Pvt. Ltd.
31	5/1/2015	TNM/SNG/0031	New joining of Mr. Vinod Kumar, Asset Manager.	S.S Misra	PWD

## 5.3 CORRESPONDENCE RECEIVED

Table 5-2 : Correspondence Received

SI #	DISPATCHED DATE	FILE NAME	SUBJECT	RECEIVED DATE	REMARKS
1	4/11/2014	PIPL/OPRC/444/2014 (1894) (1403)	submission of updated inventory data base	11/11/2014	HARD COPY NOT RECEIVED
2	10/11/2014	PIPL/OPRC/445/2014	Performance measures conformance report, Network performance report of October month	12/11/2014	RECEIVED
3	11/11/2014	PIPL/OPRC/446/2014	Organisation of HSE awareness camp	12/11/2014	ATTENDED
4	12/11/2014	1930	Social Management frame work & HIV/AIDS components	12/11/2014	ATTENDED
5	14/11/2014	PIPL/OPRC/446(A)/2014	Submission of Revised Environment management plan	14/11/2014	RECEIVED
6	14/11/2014	PIPL/OPRC/447/2014	Preparation of Earthen Shoulder on Road (B-8)	17/11/2014	REPLY
7	18/11/2014	2021	Regarding Road safety on Sangrur sunam road	19/11/2014	REPLY
8	14/11/2014	PIPL/OPRC/445(A)/2014	MPR for the month of october 2014	20/11/2014	Received
9	19/11/2014	PIPL/OPRC/448/2014	Submission of data required for OPRC project	20/11/2014	Received
10	24/11/2014	PIPL/OPRC/449/2014	Cutting of Trees on Barnala-Mansa-Sirsa (S3) road (Km 119.640 to 126.930)	25/11/2014	Received
11	28/11/2014	PIPL/OPRC/450/2014	Request for information on closing of irrigation channels	1/12/2014	REPLY
12	28/11/2014	PIPL/OPRC/451/2014	Submission of Environmental monitoring report oct-2014	1/12/2014	Received
13	26/11/2014	1523	Appointment of arbitrator	1/12/2014	Received
14	1/12/2014	2159	Regarding in principal approval of S-3	1/12/2014	Received
15	1/12/2014	2160	Regarding in principle approval of Mansa chowk	1/12/2014	Received
16	1/12/2014	2162	Regarding in principle approval of S-curve on S-2 road.	1/12/2014	Received
17	1/12/2014	2164	Monthly-cum-inspection report	1/12/2014	Received
18	2/12/2014	2169	Rescheduling of 2nd year and 3rd year work programme.	2/12/2014	Received
19	2/12/2014	PIPL/OPRC/452/2014	Unauthorized activities on OPRC network.	3/12/2014	Received
20	3/12/2014	PIPL/OPRC/453/2014	Submission of network performance Inspection report of Nov-2014	4/12/2014	Received

21	5/12/2014	PIPL/OPRC/454/2014	Rescheduling of 2nd year and 3rd year work programme.	8/12/2014	Received
22	9/12/2014	PIPL/OPRC/455/2014	Submission of HSE awareness report	10/12/2014	Received
23	10/12/2014	PIPL/OPRC/456/2014	Performance measures conformance report.	12/12/2014	Received
24	11/12/2014	PIPL/OPRC/457/2014	Submission of Canal name and RD no.	12/12/2014	Received
25	11/12/2014	PIPL/OPRC/458/2014	Requirement of data	12/12/2014	Received
26	11/12/2014	PIPL/OPRC/459/2014	Submission of Canal Drawing at chainage 59+810 on S2 road.	15/12/2014	Received
27	11/12/2014	PIPL/OPRC/460/2014	Regarding Road safety on Sangrur sunam S-1 road	12/12/2014	Received
28	11/12/2014	PIPL/OPRC/461/2014	Regarding cutting of trees on Earthen Shoulder on B-8(Bathinda-Talwandi sabo) road.	15/12/2014	Received
29	12/12/2014	PIPL/OPRC/462/2014	MPR for the month of November 2014	15/12/2014	Received
30	14/12/2014	PIPL/OPRC/463/2014	Organization of HSE awareness camp	15/12/2014	Received
31	16/12/2014	PIPL/OPRC/464/2014	IPC-17	17/12/2014	Received
32	17/12/2014	2338	Construction of 600 mm dia Hume pipe culvert on BSBK road Km. 57+030.	17/12/2014	Received
33	25/12/2014	PIPL/OPRC/465/2014	Regarding submission of Renewel of "consent to operate" certificate for HOT Mix Plant.	26/12/2014	Received
34	25/12/2014	PIPL/OPRC/466/2014	Submission of Environmental monitoring report Nov-2014	26/12/2014	Received
35	25/12/2014	PIPL/OPRC/467/2014	Submission of Labour License	26/12/2014	Received
36	25/12/2014	PIPL/OPRC/468/2014	Regarding Railing Damage.	26/12/2014	Received
37	31/12/2014	2399	OPRC Project under phase-2, package xx1 of PSRSP.	26/12/2014	Received