

**GOVERNMENT OF JAMMU AND KASHMIR**



*PMGSY DEPARTMENT (J&K)*

*JAMMU*

DETAILED PROJECT FOR CONSTRUCTION OF

ROAD PROPOSED UNDER

*BHARAT NIRMAN*

IN BLOCK MAHORE

*DISTRICT REASI*

*Name of the scheme*

GANJOTE TO PHALNI (PART-II)

*LENGTH = 30.242 KMS*

*PKG:- JK14-*

COST = Rs 3156.2077LACS

*Chief Engineer*

PMGSY (JKRRDA)

# **GANJOTE TO PHALNI**

**(Part-II)**

**STAGE IST**

**Package No:JK14-**

**L-039**

**PMGSY DIVISION MAHORE  
DISTT.REASI (BLOCK MAHORE)**

<b>A. Chapters</b>	<b>Page Nos.</b>
1. Introduction	
2. Planning and Basic Design Consideration	
3. Topographic Survey.	
4. Soil and Materials Survey	
5. Traffic Survey	
6. Hydrological Survey	
7. Geometric Design Standards	
8. Alignment Design	
9. Pavement Design	
10. Design of Cross Drainage	
11. Protective Works & Drainage	
12. Land Acquisition	
13. Utility shifting/relocation	
14. Road Safety and Traffic Management	
15. Specification	
16. Environmental Issues	
17. Analysis of Rates	
18. Cost Estimate	
19. Construction Program	

## **B. Proforma**

- |     |   |  |
|-----|---|--|
| 1.  | Proforma B  | Package Summary  |
| 2.  | Proforma C  | Check List for PIU & STA   |
| 3.  | Format F1   | Package-wise Summary Sheet   |
| 4.  | Format F2A  | Roads proposed in PMGSY for Rural Connectivity                           |
| 5.  | Format F2B  | Pavement Layers  |
| 6.  | Format F3   | Typical Cross Section of Existing Pavement                               |
| 7.  | Format F4   | Typical proposed cross section in Straight Section – Flexible Pavement   |
| 8.  | Format F5   | Summary: Cost Estimate   |
| 9.  | Format F6   | Cost estimate for Road Construction Works – Pavement Works               |
| 10. | Format F7   | Cost estimate for Cross Drainage Works – Slab Culvert                    |
| 11. | Format F8   | Rate of Materials supplied at site – Rate Analysis                       |
| 12. | Format F9A  | Certificate of Ground Verification from Executive Engineer / Head of PIU |
| 13. | Format F9B  | List of DPRs verified on Ground  |
| 14. | Environmental Checklist                             |  |
| 15. | Checklist for community consultation on engineering |  |

## **C. List of figures**

- |           |   |
|-----------|---|
| Figure-1  | Road Map of India and state   |
| Figure-2  | District Map  |
| Figure-3  | Block Maps showing all existing connectivity like District/block HQ, new townships, National and State highway network, mandis, hospitals, colleges, schools etc. |
| Figure-4  | Strip plan showing land and alignment details   |
| Figure -5 | Quarry Map  |

## **D. Annexure**

- |            |  |
|------------|--|
| Annexure-1 | Details of soil tests (Section 4.2)  |
| Annexure-2 | Detailed hydraulic calculation of all replaced and proposed new culverts (Section 6.7) |
| Annexure-3 | Chainages-wise Cut/fill volume   |
| Annexure-4 | Transect walk report   |

## 1. Introduction

### 1.1 Objectives of Pradhan Mantri Gram Sadak Yojna (PMGSY)

Rural Road connectivity is a key component of rural development by promoting access to economic and social services and thereby generating increased agricultural incomes and productive employment opportunities. It is also a key ingredient in ensuring poverty reduction.

It was against this background of poor connectivity that the Prime Minister announced in 2000, a massive rural roads program. The Prime Minister's Rural Road Program (Pradhan Mantri Gram Sadak Yojana, PMGSY) set a target of:

- Achieving all-weather road access to every village/habitation with a population greater than 1000 by 2003
- Providing all-weather road access to all villages/habitations of population greater than 500 people [250 in case of hill States (North-Eastern states, Sikkim, Himachal Pradesh, Jammu & Kashmir and Uttaranchal), the desert areas and tribal areas] by the end of the Tenth Five Year Plan, i.e., 2007

### 1.2 All Weather Road: The road which serves the targetted habitation under all weather conditions.

### 1.3 Core Network

The rural road network required for providing the 'basic access' to all villages/ habitations is termed as the Core Network. Basic access is defined as one all-weather road access from each village/ habitation to the nearby Market Centre or Rural Business Hub (RBH) and essential social and economic services.

A Core Network comprises of Through Routes and Link Routes. Through routes are the ones which collect traffic from several link roads or a long chain of habitations and lead it to a market centre or a higher category road, i.e. the District Roads or the State or National Highways. Link Routes are the roads connecting a single habitation or a group of habitations to Through Roads or District Roads leading to Market Centers. Link Routes generally have dead ends terminating on habitations, while Through Routes arise from the confluence of two or more Link Routes and emerge on to a major road or to a Market Centre.

The Core Network may not represent the most convenient or economic route for all purposes. However, since studies show 85-90% of rural trips are to market centres, the Core Network is likely to be a cost-effective conceptual frame work for investment and management purposes, particularly in the context of scarce resources.

The Sub-project road Ganjote To Phalni (Part-II) is a link road with Code **LO39** in Mahore block of **Reasi District (Erstwhile** Udhampur District). This road directly connects the habitations of Shikari to Bagai, Chakal, Chana, Chatal, Dobatal, Dogian, Hassot, Kotli, Nehosi, Phalni, with populations 427, 396, 975, 280, 240, 340, 985, 651, 528 & 990 respectively. Thus this link road serves the total population of 5812. .

#### 1.4 Geography

Road is in Mountainous terrain and starts from Shikari having road length 30.242 km. Road is in cutting and type of soil is shingle and boulders. The terrain of the road is mountainous with slope varying from 40°-70°.

#### 1.5 Climatic Condition

In summer day temperature rises to max. 35° and in winter night temperature falls to min of -2°C

#### 1.6 The Sub-Project Road

The road passes through MOUNTANEOUS TERRAIN

Road is in both cutting and filling and passes through Mountainous area. There are no hindrances in construction of road.

Distt;	Reasi
Block:	Mahore
Road Name:	Ganjote to Phalni (Part-II)
Road Code:	JK-L039
Package No:	JK14-
Road Length:	30.242 Km
Start Point:	Shikari (latitude longitude )
End Point:	Phalni (latitude longitude )

with populations 427, 396, 975, 280, 240, 340, 985, 651, 528 & 990 respectively.

Sl.No.	Habitation benefited	Population benefited		Chainage	
		Direct	Indirect	From	To
1	Bagai	427			
2	Chakal	396			
3	Chana	975			
4	Chatal	280			
5	Dobatal	240			
6	Dogian	340			
7	Hassot	985			
8	Kotli	651			
9	Nehosi	528			
10	Phalni	990			

## 2. Planning and Basic Design Consideration

### 2.1 Key maps

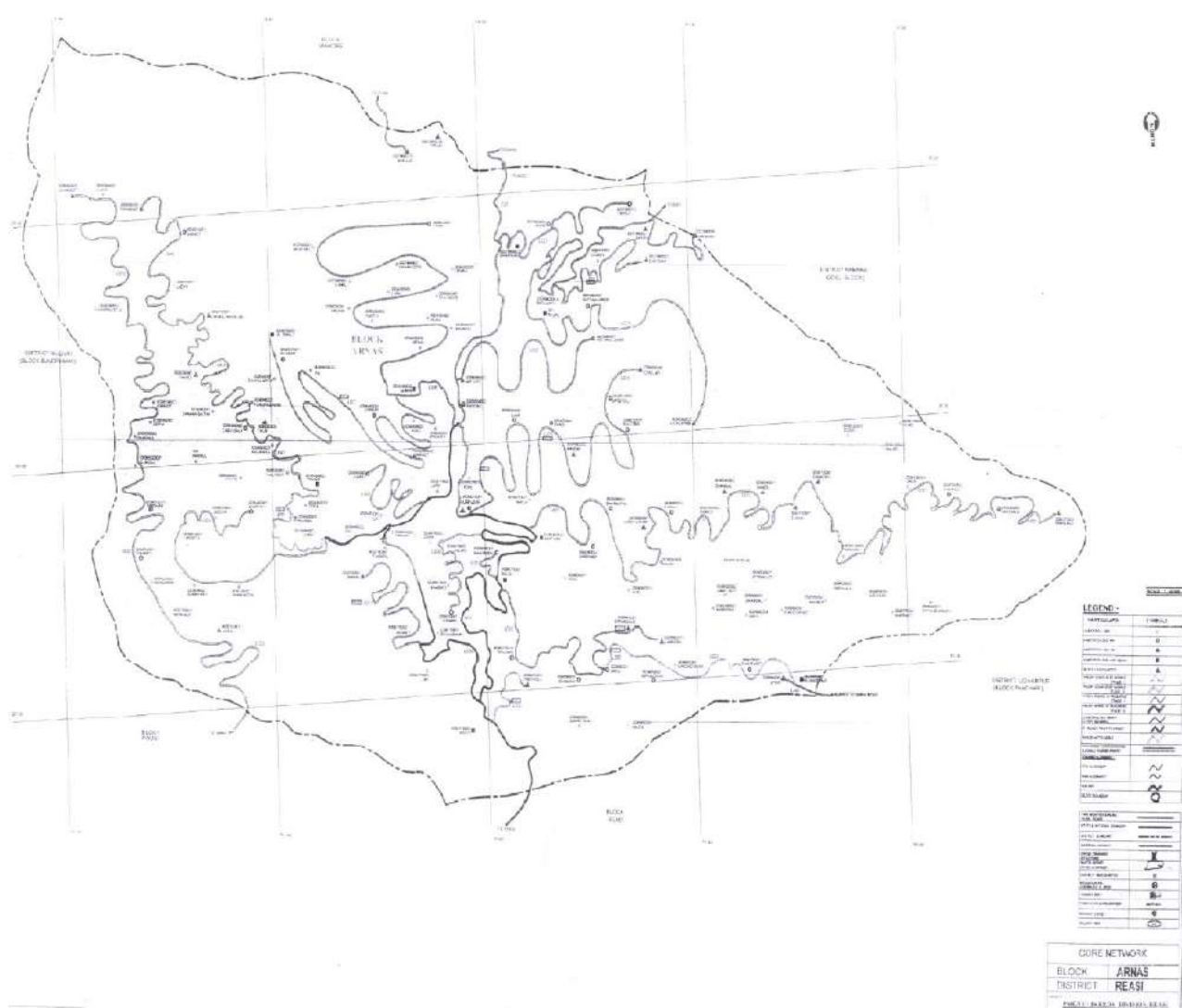
Figure-1







# BLOCK MAP : ARNAS



## 2.2 Preliminary alignment investigation

Strip plan as indicated for the road under study.

## 2.3 Site Photographs

Photographs taken at every 100m interval and/or at important changes in features

## 2.4 Road Design Brief

Table 2.1 Road Design Brief

Sl.	Location	Issue	Design Solutions
1	Ch. 9739	Take off point from last Rd of ganjote to phalni road (Part-I)	
2	Ch.10300	Local nallah	3mtr span culvert proposed
3	Ch.10820	Local nallah	3mtr span culvert proposed
4	Ch. 11050	Local nallah	6mtr span culvert proposed
5	Ch. 11720	Local nallah	2mtr span culvert proposed
6	Ch. 12330	Local nallah	2mtr span culvert proposed
7	Ch. 12720	Local nallah	2mtr span culvert proposed
8	Ch. 13120	Local nallah	2mtr span culvert proposed
9	Ch. 14830	Local nallah	2mtr span culvert proposed
10	Ch. 15275	Local nallah	2mtr span Bridge proposed
11	Ch. 15710	Local nallah	6 mtr span culvert proposed
12	Ch. 19000	Local nallah	3mtr span culvert proposed
13	Ch. 19850	Local nallah	6mtr span culvert proposed
14	Ch.20550	Local nallah	3mtr span culvert proposed
15	Ch. 20800	Local nallah	3mtr span culvert proposed
16	Ch. 21430	Local nallah	6mtr span culvert proposed
17	Ch. 22200	Local nallah	3mtr span culvert proposed
18	Ch. 22980	Local nallah	2mtr span culvert proposed
19	Ch. 23650	Local nallah	2mtr span culvert proposed
20	Ch. 25200	Local nallah	6mtr span culvert proposed
21	Ch. 26160	Local nallah	3mtr span culvert proposed
22	Ch. 28150	Local nallah	3mtr span culvert proposed
23	Ch. 29850	Local nallah	3mtr span culvert proposed
24	Ch. 29900	Local nallah	2mtr span culvert proposed
25	Ch. 30050	Local nallah	2mtr span culvert proposed
26	Ch. 32300	Local nallah	3mtr span culvert proposed
27	Ch. 34400	Local nallah	6mtr span culvert proposed
28	Ch. 34800	Local nallah	2mtr span culvert proposed
29	Ch. 39500	Local nallah	2mtr span culvert proposed

## 2.5 Transect Walk Summary

Tabular format giving the summary of the transect walk and giving the issues identified and solutions proposed by the affected communities.

Chainage	Existing Land Width*	Land Required		Type of Loss		Village	Remarks/Suggestions
		LHS	RHS	LHS	RHS		
							START POINT

Table 2.2 Transect Walk Summary

### 3. Topographic Survey

#### 3.1 General

Topographic survey true to ground realities have been done using { : Total Station for leveling survey}.

The in-house standards, work procedures and quality plan prepared with reference to IRC: SP 19-2001, IRC: SP 20, IRC: SP 13 (in respect of surveys for rivers/streams) and current international practices have been followed during the above survey.

#### 3.2 Traversing

Traversing has been done by Total Station .

#### 3.3 Leveling

Levelling is done by using Total Station, accuracy adopted, nearest assumed bench mark etc.}

#### 3.4 Cross Section & Detailing

Cross sections were taken at 25 m interval and at closer interval in curved portion of the existing road. All physical features of the road were recorded.

#### 3.5 Data Processing

All data from topographic survey recorded by survey instruments were plotted& final alignment, plan, profile were prepared.

#### 3.6 Details of Temporary Bench Mark ( TBM )

S.No.	9739.348	1346.810	Remarks
1.	10000	1353.007	On stone
2.	10500	1370.160	On stone
3.	11000	1389.767	On stone
4.	11500	1417.203	On stone
5.	12000	1444.640	On stone
6.	12500	1472.076	On stone
7.	13000	1485.100	On stone
8.	13500	1497.67	On stone
9.	14000	1513.556	On stone
10.	14500	1536.726	On stone
11.	15000	1558.215	On stone
12.	15400	1580.132	On stone
13.	15900	1569.220	On stone

14.	16300	1553.117	On stone
15.	16800	1553.096	On stone
16.	17200	1566.313	On stone
17.	17800	1586.732	On stone
18.	18000	1590.847	On stone
19.	18900	1597.563	On stone
20.	19000	1603.790	On stone
21.	19300	1585.018	On stone
22.	20100	1536.809	On stone
23.	20800	1494.626	On stone
24.	21200	1470.521	On stone
25.	27700	1440.390	On stone
26.	22000	1422.312	On stone
27.	23000	1362.050	On stone
28.	23500	1331.919	On stone
29.	24000	1301.780	On stone
30.	25000	1258.122	On stone
31.	25500	1266.018	On stone
32.	27000	1331.073	On stone
33.	27600	1357.096	On stone
34.	28800	1409.138	On stone
35.	29800	1452.557	On stone
36.	23400	1486.220	On stone
37.	31300	1509.60	On stone
38.	32000	1489.439	On stone
39.	32800	1517.830	On stone
40.	33300	1535.199	On stone
41.	34200	1502.004	On stone

<b>42.</b>	<b>35000</b>	<b>1480.237</b>	<b>On stone</b>
<b>43.</b>	<b>35750</b>	<b>1463.742</b>	<b>On stone</b>
<b>44.</b>	<b>36400</b>	<b>1484.227</b>	<b>On stone</b>
<b>45.</b>	<b>37000</b>	<b>1497.315</b>	<b>On stone</b>
<b>46.</b>	<b>37900</b>	<b>1532.825</b>	<b>On stone</b>
<b>47.</b>	<b>38300</b>	<b>1540.417</b>	<b>On stone</b>
<b>48.</b>	<b>39000</b>	<b>1562.628</b>	<b>On stone</b>
<b>49.</b>	<b>39500</b>	<b>1556.283</b>	<b>On stone</b>
<b>50.</b>	<b>39700</b>	<b>1556.790</b>	<b>On stone</b>
<b>51.</b>	<b>39975</b>	<b>1557.763</b>	<b>On stone</b>

### 3.7 Checklist

Reference pillars given	Yes
TBM with northing-easting given	Yes
Traverse survey carried out	Yes
Cross section and detailing carried out	Yes



#### 4. Soil and Materials Survey –BEING STAGE-I, N/A

##### 4.1 General

The soil and material investigations were done following the guidelines of IRC: SP: 20-2002 and IRC: SP: 72-2007 and other relevant IS codes. The potential sources of borrow areas for soil and quarry sites will not required.

##### 4.2 Soil sample collection and Testing

Soil samples will be collected along and around the road alignment at three (3) locations per km, from the adjoining borrow areas, as well as one sample is collected from the existing road. Soil Classification tests like grain size analysis and Atterberg's limit were conducted for all the samples collected. Standard Proctor test and the corresponding 4 day soaked CBR test were conducted either for a minimum of one test per km for soil samples of same group or more tests due to variation of soil type. The following tests were conducted as detailed below:

- Grain size analysis as per IS : 272 (Part 4) – 1985
- Atterberg's limit as per IS : 2720 (Part 5) – 1985
- Standard Proctor density test as per IS : 2720 (Part 7) – 1980
- 4 day soaked CBR test as per IS : 2720 (Part 16) – 1985

{The IRC Rural Roads Manual SP: 20 contain instructions on Soil Survey and materials for the road projects. Supplementary guidance on these subjects is given in Annexure 5.1. The identification of the soil type in the field and the quick determination of its properties, including CBR are the basic requirement for an economical pavement design. The grain-size (wet sieve) analysis leading to the soil classification is a simple test and must be carried out to have an idea of the CBR value with a reasonable level of accuracy; the nomograph given in Annexure 5.2 can be used. This would minimise the need for CBR determination in lab. The determination of CBR by a rigorous CBR apparatus on a large number of samples may not be possible unless properly planned, and hence the nomograph given in Annexure 5.2 may be used.}  
{Insert the details of soil tests in Annexure-1}

##### 4.3 Analysis of Test Results

The laboratory soaked CBR value ranges from .....% to .....% {Insert range}. The soil laboratory test results will be summarized in Table 4.1 {Insert the summary of soil test results in table}

Table 4.1 CBR values for different stretches

Sl.No.	Section	CBR (%)

##### 4.4 Coarse and Fine Aggregates

Information regarding the source of aggregate and sand will be gathered. The stone aggregates shall be procured from Baradari Crusher and sand from Baradari Nallah . The source and the lead distance from the quarry to project site will be finalized in discussion with the PIU. The aggregates and sand where available and acceptable shall be used for bituminous work, concrete works, other pavement works.

## SIEVE ANALYSIS

**COARSE AGGREGATES = 40mm**

**wt. of sample taken=4000gms**

I.S-Sieve designation	Wt. of sample retained(gms)	percent of wt. retained(%)	Cumulative percent of wt. retained(%)	%age of passing (%)	Permissible limits(%)
63mm	-	-	-	100.00	
40mm	125	3.12	3.12	96.88	
20mm	2070	51.75	54.87	45.13	
10mm	1340	33.50	88.37	11.63	
4.75mm	425	10.62	98.99	1.01	
Pan	40	-	-	-	
<b>COARSE AGGREGATES = 20mm</b>			<b>wt. of sample taken=4000gms</b>		
40mm	-	-	-	100.00	100.00
20mm	188	4.70	4.70	95.30	95-100
10mm	2265	56.62	61.32	38.68	25-55
4.75mm	1463	36.57	97.89	2.10	0-10
Pan	84	-	-	-	-
<b>COARSE AGGREGATES = 12.5mm</b>			<b>wt. of sample taken=4000gms</b>		
20mm	-	-	-	-	-
12.50mm	310	7.75	7.75	92.25	90-100
10mm	1912	47.80	55.55	44.45	40-85
4.75mm	1595	39.87	95.42	4.57	0-10
Pan	183	-	-	-	-

**FINE AGGREGATES = SAND**

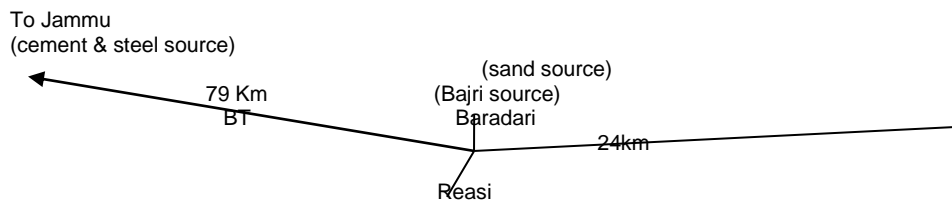
**wt. of sample taken=5000gms**

I.S-Sieve designation	Wt. of sample retained(gms)	percent of wt. retained(%)	Cumulative percent of wt. retained(%)	%age of passing (%)	Permissible limits(%)
10mm	8.00	0.16	0.16	99.84	100.00
4.75mm	85.00	1.70	1.86	98.14	90-100

2.36mm	65.00	1.30	3.16	96.84	85-100
1.18mm	98.00	1.96	5.12	94.88	75-100
600micron	1736.00	34.72	39.84	60.16	60-79
300micron	1845.00	36.90	76.74	23.26	12-40
150micron	1138.00	22.76	99.50	0.50	0-10
Pan	25.00	-	-	-	-

Fineness Modulus of sand=3.03

Figure -3 Quarry Map {Insert the quarry map}



4.5 Sub-soil investigation for bridges-NOT APPLICABLE

4.6 Checklist

Borrow pit suitable	No
SSI for existing ground	yes
Investigation for coarse/fine aggregate	Yes
Quarry map	Yes

## 5. Traffic Survey –BEING STAGE-I, N/A

### 5.1 General

{In addition to traffic counts on the project road, traffic counts must be taken on already completed or similar type of PMGSY road in the vicinity of the project road to provide a realistic count.} In the present scenario of new connectivity/upgradation road, 3 day, 24 hr traffic volume count has been conducted on the already completed or similar type of PMGSY road in the vicinity of the project road. The Classified Volume Count survey has been carried out in accordance with the requirements of the TOR and relevant codes (IRC: SP: 19-2001, IRC: SP: 20, IRC: SP: 72-2007).The surveys have been carried out by trained enumerators manually under the monitoring of Engineering Supervisor. ( present scenario is new connectivity)

### 5.2 Traffic Data and Analysis

The traffic count done was classified into different vehicle category as given below:

- Motorized vehicle comprising of light commercial vehicle, medium commercial vehicle, heavy commercial vehicle, trucks, buses, agricultural tractors with trailers, car, jeep, two wheelers etc.
- Non- motorized vehicles comprising of cycle, rickshaw, cycle van, animal drawn vehicle etc.

The number of laden and un-laden commercial vehicles was recorded during the traffic counts. Traffic volume count for this project road was done during {insert season} season. The seasonal variation {insert seasonal variation} is based on local enquiry.

Average of 3 day traffic data is presented in Table 5.1.

Table 5.1 Average Daily Traffic at {Insert location} (both ways) {The table will be repeated for the number of locations surveyed. This must include counts taken on the similar road.}

Sl. No.	Type of Vehicle	Day-1	Day-2	Day-3	Average
1	Car, Jeep, Van				
2	Auto Rickshaw				
3	Scooters/Motorbikes				
4	Bus / Minibus				
5	Trucks				
6	Tractors with trailers				
7	Tractors without trailers				
8	Cycles				
9	Cycle Rickshaw / Hand Cart				
10	Horse cart / Bullock Cart				
11	Pedestrian				
Total commercial vehicle per day (cvpd)					
Total motorised vehicle per day					
Total non-motorised vehicle per day					

{Tick the relevant box}

- a) Traffic volume and mix do not vary along the road
- b) Traffic volume and mix vary along the road
- c) Traffic volume and mix will vary along the road in the future
- d) There is a potential for through traffic using the road ☐
- e) % of loaded vehicles ☐

### 5.3 Traffic Growth Rate and forecast

{“Read – Delete”: Depending on the case or combination of cases, the designers should select the location of traffic counts and apply different growth scenarios. In all cases as described in 5.2 above, except for (a), the designers will be required to provide more detail, e.g., explain reasons (e.g., traffic coming from ...side road at ...chainage etc), specify homogenous sections etc. Insert a proper assessment of the possible traffic growth (normal, generated and diverted) taking care of mining or other economic activities that might generate traffic. The Consultants should exercise good judgment to properly estimate future traffic specially taking care of diverted and generated traffic. The Consultants may, in case no data is available, use similar studies to estimate growth trend. Growth rates shall be shown separately for different types of vehicle where there are specific generators of traffic (eg mining activities). Where there are no specific generators of traffic growth, the consultant may adopt an average annual growth rate of 6% over the design life as set out in IRC: SP 72-2007.}

Table 5.2 Average Annual Daily Traffic at {Insert location} (both ways) {This table will be repeated for each homogeneous section of the road.}

Sl. No.	Type of Vehicle	ADT	AADT	Growth Rate
1	Car, Jeep, Van			
2	Auto Rickshaw			
3	Scooters/Motorbikes			
4	Bus / Minibus			
5	Trucks			
6	Tractors with trailers			
7	Tractors without trailers			
8	Cycles			
9	Cycle Rickshaw / Hand Cart			
10	Horse cart / Bullock Cart			
11	Pedestrian			
Total commercial vehicle per day (cvpd)				
Total motorised vehicle per day				
Total non-motorised vehicle per day				

## 6. Hydrological Survey

### 6.1 General

Hydrological survey is necessary for design of adequate and safe Cross Drainage Structures so that the rain water can pass as per natural slope. Hydrological survey of the proposed road is based on the following observations:

- Rainfall Data
- Catchments Area
- Time of Concentration
- Existing Cross Drainage Structures

### 6.2 Rainfall Data

Rainfall Data as applicable for the project road were collected with maximum rainfall occurring in the months of {JULY,AUGUST & SEPTEMBER}.

### 6.3 Catchment Area

The Catchments area is calculated by gathering local information and topographical survey data as it was not possible to calculate from topographical sheets due to their unavailability.

### 6.4 Time of Concentration

Time of concentration (tc) in hours is calculated from the formula of  $(0.87 \times L^3 / H)^{0.385}$ , where L is distance from the critical point to the structure site in km and H is the difference in elevation between the critical point and the structure site in meters.

### 6.5 Existing Cross Drainage Structures

There is{no} number of cross drainage structures along the existing project road as listed below:

{Insert the data in the table below} - NOT APPLICABLE

Table-6.1 List and condition of existing culverts

Sl.	Chainage (km)	Description of Existing Structure		
		Type	Span/ Dia. (m)	Condition

## 7. Adopted Geometric Design Standards

### 7.1 General

The geometric design standards for this project conform to PMGSY guidelines and the guidelines as stated in IRC-SP 20:2002. Recommended design standards vis-à-vis the standards followed for this road are described below. {Consultants shall review these guidelines with respect to the Expenditure Committee guidelines “Review of Geometric Design Standards for Rural Roads in Hill Areas (meeting at Mussorie – 29-30 November 2007) and Review of Geometric Design Standards for Rural Roads in Plains}

### 7.2 Terrain

The classification of terrain was selected from plain/rolling/hilly/steep classification for which following criteria will be applicable. {Delete cases not applicable}

Terrain classification	Cross slope of the country	
Plain		
Rolling		
Mountainous	25-60%	1 in 4 to 1 in 1.67
Steep		

### 7.3 Design Speed

The proposed design speed along this project road will be selected from the following table:

Road classification	Plain terrain		Rolling terrain		Mountainous terrain		Steep terrain	
	Ruling	Min.	Ruling	Min.	Ruling	Min.	Ruling	Min.
Rural Roads (ODR and VR)	-	-	-	-	25	20	-	-

### 7.4 Right of Way (ROW)

The requirement of ROW for this road is as follows (as specified in IRC-SP 20:2002):

Road classification	Plain and Rolling Terrain				Mountainous and Steep Terrain			
	Open Area		Built-up Area		Open Area		Built-up Area	
	Normal	Range	Normal	Range	Normal	Range	Normal	Range
Rural roads (ODR and VR)	-	-	-	-	12	12	12	9

### 7.5 Roadway Width

Roadway width for this road is given below:

Terrain Classification	Roadway Width (m)
Plain and Rolling	-
Mountainous and Steep	6.0

### 7.6 Carriageway Width

The width of carriageway for this project road is 3.75m. Carriageway width may be restricted to 3.0m, where traffic intensity is less than 100 motorised vehicles per day and where the traffic is not likely to increase due to situation, like dead end, low habitation and difficult terrain condition.

### 7.7 Shoulders

It is proposed to have {1.875 m } wide earthen shoulder on both sides.

### 7.8 Roadway width at cross-drainage structures

The roadway width at culvert locations for this road is { 6.0m in mountainous terrain}. Roadway width at bridges - 4.5m

### 7.9 Sight Distance

The safe stopping sight distance is applicable in the geometric design. The sight distance values for this road as per IRC recommendations are presented below:

Design Speed (km/hr)	Safe Stopping Sight Distance (m)
20	20

### 7.10 Radius of Horizontal Curve

According to IRC recommendations/standards, the minimum radius of horizontal curve for this project road is given below:

Terrain Category	Radius of Horizontal Curve (m)	
	Ruling Minimum	Absolute Minimum
Mountainous	20	14

To minimize extra land arrangement, minimum radius used is 20 m and design speed in these curves are also restricted to 20 km/hr.

### 7.11 Camber & Super elevation

A camber adopted on this road section is given below. The maximum super elevation is 5.0% for this project road.

Surface type	Camber (%)	
	Low rainfall (Annual rainfall <1000mm)	High rainfall (Annual rainfall >1000mm)
Earth road	4.0	5.0
WBM Gravel road		
Thin bituminous road		
Rigid Pavement		

### 7.12 Vertical Alignment

The present road is in mountainous terrain and vertical alignment has been designed well within ruling gradient.

Generally, minimum gradient of 0.3% for drainage purpose is considered for designing the vertical alignment of this road. Vertical curves are not required when grade change is less than 1%, however a minimum vertical curve is provided to avoid vertical kink.

### 7.13 Vertical Curves

For satisfactory appearance, the minimum length of vertical curve for different design speed is given in IRC-SP 20:2002. Vertical curves will be designed to provide the visibility at least corresponding to the safe stopping sight distance. Valley curves will be designed for headlight sight distance.



#### 7.14 Side slope

Side slope for this rural road where embankment height is less than 3.0m is given in the table below.

Condition	Slope (H:V)
Embankment in silty/sandy/gravel soil	
Embankment in clay or clayey silt or inundated condition	
Cutting in silty/sandy/gravelly soil	
Cutting in disintegrated rock or conglomerate	
Cutting in soft rock like shale	0.25:1 to 0.125:1
Cutting in medium rock like sandstone, phyllite	0.083:1 to 0.0625:1
Cutting in hard rock like quartzite, granite	Near vertical

#### 7.15 Extra Widening of Pavement

The Extra Widening of Pavement at Curve as per IRC guideline is given below:

Radius of Curve (m)	Upto 20	21 - 60	Above 60
Extra Widening for 3.75 m wide single lane carriageway, (m)	0.9	0.6	Nil

## 8. Alignment Design

### 8.1 General

The basic aim of highway design is to identify technically sound, environment-friendly and economically feasible highway alignment. The ensuing sections deals with obligatory points, which control highway alignment, design of cross-section, highway geometric design & methodology, design of miscellaneous items.

The main components included in the highway design are:

- Cross-sectional elements
- Embankment
- Horizontal alignment
- Vertical profile
- Junctions and/or Interchanges
- Road furniture
- Miscellaneous items

### 8.2 Horizontal alignment ( present scenario is new connectivity)-NO EXISTING TRACK

{Insert a table (example given below) on the physical features of the existing alignment and possible geometric improvement required}

Table 8.1 – Features of Horizontal Alignment

Chainage		Length	Description	Reason for deviation from existing alignment, if necessary
From (km)	To (km)	(km)		

Checklist

- a) Centre line of the existing and proposed horizontal alignment coincide **NOT APPLICABLE**
- b) Centre line of the existing and proposed horizontal alignment **NOT APPLICABLE**  
deviate at certain sections

{Where the proposed horizontal alignment deviates from the centreline of the existing alignment, and where the clearance of the proposed horizontal alignment from existing roadside features (eg houses, temples, ponds, etc) is very tight, the horizontal alignment plan shall be drawn at large scale in the drawing set. }

{Insert a schematic diagram showing linear offsets from existing alignment as example attached}

**Figure 8.1** Schematic diagram showing location and offsets from existing alignment

**-NOT APPLICABLE**

Table on the various horizontal geometric improvement carried out and their detail

Table 8.2 – Horizontal Curve details

S.No.	Chainage	Radius (m)	L <sub>s</sub> (m)	Speed Kmph	S.E %age	Deflection angle			L <sub>c</sub> (m)	Total L(m)	Hand of Curve
						D	M	S			
1.											
2.											
3.											
4.											
5.											
6.											
7.											
8.											
9.											
10.											
11.											
12.											
13.											
14.											
15.											
16.											
17.											
18.											

Table on the various vertical geometric improvement carried out and their details

Table 8.3 – Vertical Curve Details

Sl. N O.	Chainage (m)	Level of pvi	Length of curve	Type of curve	Grade in (%)	Grade out (%)	Grade difference (%)	Chainage		Level	
								St. of Curve	End of Curve	St. of Curve	End of Curve
1	9779.774	1345.887	15	Sag	-2.284	3.233	5.517	9772.274	9787.274	1346.058	1346.129
2	10224.84	1360.276	10	Sag	3.233	3.592	0.359	10219.84	10229.84	1360.114	1360.455
3	10913.07	1384.997	35	Sag	3.592	5.487	1.895	10895.57	10930.57	1384.369	1385.958
4	12515.21	1472.91	15	Hog	5.487	2.514	-2.973	12507.71	12522.71	1472.499	1473.099
5	13760.36	1504.219	10	Sag	2.514	3.896	1.382	13755.36	13765.36	1504.093	1504.413
6	14009.67	1513.932	25	Sag	3.896	4.406	0.509	13997.17	14022.17	1513.445	1514.483
7	14256.43	1524.804	25	Sag	4.406	4.895	0.489	14243.93	14268.93	1524.253	1525.415
8	14700.6	1546.546	30	Hog	4.895	3.897	-0.998	14685.6	14715.6	1545.812	1547.13
9	15028.13	1559.311	25	Sag	3.897	5.599	1.702	15015.63	15040.63	1558.824	1560.011
10	15487.89	1585.054	15	Hog	5.599	-3.84	-9.439	15480.39	15495.39	1584.634	1584.766
11	15894.82	1569.428	10	Hog	-3.84	-4.026	-0.186	15889.82	15899.82	1569.62	1569.227
12	16486.65	1545.604	15	Sag	-4.026	2.391	6.416	16479.15	16494.15	1545.906	1545.783
13	17084.09	1559.888	10	Sag	2.391	5.543	3.152	17079.09	17089.09	1559.769	1560.166
14	17403.97	1577.618	10	Hog	5.543	2.301	-3.241	17398.97	17408.97	1577.341	1577.733
15	17937.92	1589.906	15	Hog	2.301	1.517	-0.784	17930.42	17945.42	1589.733	1590.019
16	18145.27	1593.051	10	Sag	1.517	2.027	0.51	18140.27	18150.27	1592.975	1593.153
17	18360.94	1597.423	10	Hog	2.027	1.18	-0.847	18355.94	18365.94	1597.321	1597.482
18	18739.18	1601.886	35	Hog	1.18	-2.688	-3.867	18721.68	18756.68	1601.679	1601.415
19	19235.95	1588.878	15	Sag	-6.32	-6.026	0.294	19233.6	19238.3	1589.027	1588.737
20	24472.68	1273.304	25	Sag	-6.026	-2.879	3.147	24464.8	24480.56	1273.779	1273.077
21	25191.09	1252.62	60	Sag	-2.879	4.337	7.216	25161.07	25221.11	1253.485	1253.922
22	29817.87	1453.283	80	Sag	4.337	5.658	1.321	29774.92	29860.82	1451.421	1455.713
23	30845.92	1511.45	15	Hog	5.658	-0.406	-6.064	30838.4	30853.44	1511.025	1511.42
24	31457.96	1504.751	25	Sag	-5.224	1.763	6.988	31445.46	31470.46	1505.404	1504.972
25	31547.45	1506.329	20	Hog	1.763	-5.81	-7.573	31537.45	31557.45	1506.153	1505.748
26	31860.79	1488.125	25	Sag	-5.81	0.95	6.76	31848.29	31873.29	1488.851	1488.243
27	32341.67	1492.693	20	Sag	0.95	5.484	4.534	32331.67	32351.67	1492.598	1493.242
28	33190.4	1539.241	25	Hog	5.484	-3.688	-9.173	33177.9	33202.9	1538.556	1538.78
29	34579.46	1488.008	30	Sag	-3.688	-1.848	1.84	34564.46	34594.46	1488.561	1487.731
30	35431.43	1472.264	25	Hog	-1.848	-5.192	-3.344	35418.93	35443.93	1472.495	1471.615
31	35629.88	1461.961	35	Sag	-5.192	1.482	6.675	35612.38	35647.38	1462.87	1462.22
32	36140.99	1469.538	40	Sag	1.482	5.671	4.189	36120.99	36160.99	1469.241	1470.672
33	36697.27	1501.086	35	Hog	5.671	-1.246	-6.917	36679.77	36714.77	1500.093	1500.868
34	37037.64	1496.846	30	Sag	-1.246	4.766	6.012	37022.64	37052.64	1497.033	1497.561
35	37736.73	1530.167	25	Hog	4.766	1.628	-3.139	37724.23	37749.23	1529.571	1530.371
36	38270.29	1538.853	30	Sag	1.628	5.265	3.637	38255.29	38285.29	1538.609	1539.643
37	38633.2	1557.96	40	Hog	5.265	1.38	-3.886	38613.2	38653.2	1556.907	1558.236
38	38985.16	1562.816	25	Hog	1.38	-1.269	-2.649	38972.66	38997.66	1562.644	1562.657
39	39512.36	1556.126	20	Sag	-1.269	0.354	1.623	39502.36	39522.36	1556.253	1556.161

The proposed alignment intersects cross roads and forms junctions. The locations of junctions are given below: **NOT APPLICABLE**

{Insert location of important junctions, type and any major intersections improvement proposed.}

Table 8.4 – List intersections, type and proposed modifications

Sl.	Type of intersection	Location (km)	Exiting condition	Proposed modification

## 9. Pavement Design –BEING STAGE-I,N/A

### 9.1 General

Considering the subgrade strength , projected traffic and the design life, the pavement design for low volume PMGSY roads was carried out as per guidelines of IRC: SP: 72 – 2007, or IRC SP:77 “Design of Gravel Road” and IRC SP:62-2004 “Cement Concrete roads”. In built up area for hygienic and safety reasons, C.C. pavement was used with a hard shoulder and drain appropriate line drain.

### 9.2 Pavement Design Approach

#### 9.2.1 Design Life

A design life of 10 years was considered for the purpose of pavement design of flexible and granular pavements.

#### 9.2.2 Design Traffic

The average annual daily traffic (AADT) for the opening year as well as the total commercial vehicle per day (CVPD) was presented in Table 5.2.

#### 9.2.3 Determination of ESAL applications

Only commercial vehicles with a gross laden weight of 3 tonnes or more are considered. The design traffic was considered in terms of cumulative number of standard axles to be carried during the design life of the road. The numbers of commercial vehicles of different axle loads are converted to number of standard axle repetitions by a multiplier called the Vehicle Damage Factor (VDF). An indicative VDF value was considered as the traffic volume of rural road does not warrant axle load survey.

For calculating the VDF, the following categories of vehicles was considered as suggested in paragraph 3.4.4 of IRC: SP: 72 – 2007.

- Laden heavy/medium commercial vehicles
- Un-laden /partially loaded heavy/medium commercial vehicles
- Over loaded heavy/medium commercial vehicles

Indicative VDF values considered 10% of laden MCV and 10% laden HCV as overloaded & given below:

Vehicle type	Laden	Un-laden /Partially laden
HCV		
MCV		

Lane distribution factor (L) for Single lane road = 1.0 Cumulative ESAL application =  $T_o \times 4811 \times L$ , where  $T_o$  = ESAL application per day. The Cumulative ESAL application for the project road as per paragraph 3.5 of IRC: SP: 72 – 2007 is presented in Annexure { NOT APPLICABLE }

#### 9.2.4 Subgrade CBR

The subgrade CBR range of {-----to-----} was considered and the traffic falls in the {NOT APPLICABLE} category.

### 9.3 Design Alternatives

{Insert design alternatives like flexible vs. rigid pavement and paved vs. normal shoulders}

Design alternatives considered { NOT APPLICABLE }

Chainage		Design alternatives considered						Specify design alternative selected	Justification
From	To	Pavement		Shoulder			Soil stabilization and use of locally available marginal materials.		
		Flexible	Rigid	Earthen full width	Hard Full width	Hard shoulder 0.875 m each side			
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

### 9.4 Pavement composition

#### Flexible Pavement

The designed pavement thickness and composition was calculated by referring Figure 4 (Pavement design catalogue) of IRC: SP: 72 – 2007. The ratio between heavy commercial vehicles and medium commercial vehicles as given in Chapter 5 should be maintained as far as possible.

The pavement layers provided are given below: Not applicable

Top Layer	Premix Carpet with Type B Seal Coat	
Base Layer	WBM Grading III & WBM Grading II	
Sub – Base Layer	Granular Sub-base Grading II	
Total thickness		

Top layer of WBM will be treated with bituminous surface. {If the pavement thickness varies over the entire length of the road section a table showing different thickness adopted should be given.}

#### Rigid Pavement

{Insert cc pavement design wherever provided, if not delete}

### 9.5 Embankment Design NOT APPLICABLE

{Insert embankment design for high embankments (above 6m) especially at bridge approaches. Related soil investigations need to be done for borrow earth and existing ground}

## 10. Design of Cross Drainage Works

### 10.1 General

On the basis of hydrological survey, {10} new cross drainage structures are recommended for the project road as listed below. {Consultants shall review these guidelines with respect to the Expenditure Committee guidelines "Review of Geometric Design Standards for Rural Roads in Hill Areas (meeting at Mussorie – 29-30 November 2007) and Review of Geometric Design Standards for Rural Roads in Plains}

### 10.2 Hydrological Design –Not Applicable

The existing structures in poor condition that are proposed for replacement as listed below. Agricultural conduits, which basically act as balancers, have also been provided as listed below.

### 10.3 Design Feature

Design Standards for culverts has been prepared based on standard codes and guidelines of IRC: SP: 20: 2002 and similar type of ongoing projects. General features of the designed cross drainage structures are given below:

For hume pipe culvert, minimum road width has been taken as {7.5} m,

Width of culvert : 6.00 m with parapet.

Width of Bridge:. 4.50 m (One Bridge at Chainage 30170).

### 10.4 Justification for retaining/widening and replacement of culverts

{NOT APPLICABLE }

### 10.5 Hydraulic calculation for Culvert .

Causeways and submersible bridges – Design to be done as per SP-20 and SP-82:2005.

#### 1.DESIGN CALCULATION FOR 2.0M SPAN CULVERTS

Catchment area(Q) = 16.0 Hectares  
Waterway(a) =  $Q/10.90 = 16/10.90 = 1.46$   
Depth of flow(d) = 0.65 m  
Linear Waterway ( $L_w$ ) =  $a/d = 1.46/0.65 = 2.25$   
Hence provided span of culvert =2.0m

#### 2.DESIGN CALCULATION FOR 3.0M SPAN CULVERTS

Catchment area(Q) = 22.0 Hectares  
Waterway(a) =  $Q/10.90 = 22/10.90 = 2.01$   
Depth of flow(d) = 0.75 m  
Linear Waterway ( $L_w$ ) =  $a/d = 2.01/0.75 = 2.68$   
Hence provided span of culvert =3.0m

#### 3.DESIGN CALCULATION FOR 6.0M SPAN CULVERTS

Catchment area(Q) = 25.0 Hectares  
Waterway(a) =  $Q/10.90 = 25/10.90 = 2.29$   
Depth of flow(d) = 0.40 m  
Linear Waterway ( $L_w$ ) =  $a/d = 2.29/0.40 = 5.72$   
Hence provided span of culvert =6.0m



Table 10.2 Proposed Culverts

Sl. No.	Chainage	Type of Culvert	Span/dia
1	9800	HPC	(1 x 1000 MM)
2	10050	SCUPPER	(1 x 6.0 M)
3	10300	SLAB	(1 x 3.0 M)
4	10520	HPC	(1 x 1000 MM)
5	10820	SLAB	(1 x 3.0 M)
6	11050	SLAB	(1 x 6.0 M)
7	11230	HPC	(1 x 1000 MM)
8	11450	SCUPPER	(1 x 6.0 M)
9	11720	SLAB	(1 x 2.0 M)
10	12000	HPC	(1 x 1000 MM)
11	12330	SLAB	(1 x 2.0 M)
12	12610	SCUPPER	(1 x 6.0 M)
13	12720	SLAB	(1 x 2.0 M)
14	13120	SLAB	(1 x 2.0 M)
15	13470	SCUPPER	(1 x 6.0 M)
16	13520	HPC	(1 x 1000 MM)
17	13800	HPC	(1 x 1000 MM)
18	14040	HPC	(1 x 1000 MM)
19	14400	HPC	(1 x 1000 MM)
20	14770	SCUPPER	(1 x 6.0 M)
21	14830	SLAB	(1x2.0 M)
22	15020	HPC	(1 x 1000 MM)
23	15275	SLAB	(1x2.0 M)
24	15440	SCUPPER	(1 x 6.0 M)
25	15710	SLAB	(1x6.0 M)
26	15900	HPC	(1 x 1000 MM)
27	16200	HPC	(1 x 1000 MM)
28	16400	HPC	(1 x 1000 MM)
29	16700	HPC	(1 x 1000 MM)
30	16980	HPC	(1 x 1000 MM)
31	17100	HPC	(1 x 1000 MM)
32	17400	HPC	(1 x 1000 MM)
33	17650	HPC	(1 x 1000 MM)
34	17800	HPC	(1 x 1000 MM)
35	17940	HPC	(1 x 1000 MM)
36	18200	HPC	(1 x 1000 MM)
37	18400	HPC	(1 x 1000 MM)
38	18750	HPC	(1 x 1000 MM)
39	19000	SLAB	(1 x 3.0 M)
40	19089.706	HPC	(1 x 1000 MM)
41	19230	HPC	(1 x 1000 MM)
42	19450	SCUPPER	(1 x 6.0 M)
43	19850	SLAB	(1 x 6.0 M)
44	20210	HPC	(1 x 1000 MM)
45	20550	SLAB	(1 x 3.0 M)
46	20800	SLAB	(1 x 3.0 M)
47	21000	HPC	(1 x 1000 MM)
48	21300	SCUPPER	(1 x 6.0 M)
49	21430	SLAB	(1 x 6.0 M)
50	21700	HPC	(1 x 1000 MM)
51	21870	HPC	(1 x 1000 MM)
52	22200	SLAB	(1 x 3.0 M)
53	22700	HPC	(1 x 1000 MM)
54	22980	SLAB	(1 x 2.0 M)
55	23160	SCUPPER	(1 x 6.0 M)
56	23400	HPC	(1 x 1000 MM)
57	23650	SLAB	(1 x 2.0 M)

58	24000	HPC	(1 x 1000 MM)
59	24290	HPC	(1 x 1000 MM)
60	24400	HPC	(1 x 1000 MM)
61	24700	SCUPPER	(1 x 6.0 M)
62	24900	HPC	(1 x 1000 MM)
63	25200	SLAB	(1 x 6.0 M)
64	25500	HPC	(1 x 1000 MM)
65	25680	HPC	(1 x 1000 MM)
66	25930	SCUPPER	(1 x 6.0 M)
67	26160	SLAB	(1 x 3.0 M)
68	26400	HPC	(1 x 1000 MM)
69	26600	HPC	(1 x 1000 MM)
70	26900	HPC	(1 x 1000 MM)
71	27080	HPC	(1 x 1000 MM)
72	27450	HPC	(1 x 1000 MM)
73	27800	HPC	(1 x 1000 MM)
74	28150	SLAB	(1 x 3.0 M)
75	28230	SCUPPER	(1 x 6.0 M)
76	28600	HPC	(1 x 1000 MM)
77	28800	HPC	(1 x 1000 MM)
78	29000	HPC	(1 x 1000 MM)
79	29400	HPC	(1 x 1000 MM)
80	29850	SLAB	(1 x 3.0 M)
81	29900	SLAB	(1 x 2.0 M)
82	30000	SCUPPER	(1 x 6.0 M)
83	30050	SLAB	(1 x 2.0 M)
84	30300	HPC	(1 x 1000 MM)
85	30600	HPC	(1 x 1000 MM)
86	30850	HPC	(1 x 1000 MM)
87	31100	HPC	(1 x 1000 MM)
88	31330	HPC	(1 x 1000 MM)
89	31600	HPC	(1 x 1000 MM)
90	31850	HPC	(1 x 1000 MM)
91	32070	SCUPPER	(1 x 6.0 M)
92	32300	SLAB	(1 x 3.0 M)
93	32450	HPC	(1 x 1000 MM)
94	32780	HPC	(1 x 1000 MM)
95	33000	HPC	(1 x 1000 MM)
96	33300	HPC	(1 x 1000 MM)
97	33590	HPC	(1 x 1000 MM)
98	33890	SCUPPER	(1 x 6.0 M)
99	34200	HPC	(1 x 1000 MM)
100	34400	SLAB	(1 x 6.0 M)
101	34670	SLAB	(1 x 3.0 M)
102	34800	SLAB	(1 x 2.0 M)
103	35100	SCUPPER	(1 x 6.0 M)
104	35370	HPC	(1 x 1000 MM)
105	35710	SCUPPER	(1 x 6.0 M)
106	35950	HPC	(1 x 1000 MM)
107	36300	HPC	(1 x 1000 MM)
108	36470	HPC	(1 x 1000 MM)
109	36900	HPC	(1 x 1000 MM)
110	37200	SCUPPER	(1 x 6.0 M)
111	37500	HPC	(1 x 1000 MM)
112	37750	SCUPPER	(1 x 6.0 M)
113	38100	HPC	(1 x 1000 MM)
114	38400	HPC	(1 x 1000 MM)
115	38700	HPC	(1 x 1000 MM)
116	39000	HPC	(1 x 1000 MM)
117	39500	SLAB	(1 x 3.0 M)
118	39980	HPC	(1 x 1000 MM)

## 11. Protective Works & Drainage

### 11.1 General

Mountaneous terrain and drainage condition along the road is under study as the road is new connectivity

### 11.2 Road side drain

As the insufficient drainage of surface water leads to rapid damage of road, road side drain as shown in drawing volume has been provided particularly on the location of habitation areas. Sketch for a standard roadside drain should be made available.

### 11.3 Protective Works

Necessary protection works consisting of R/walls&B/walls have been provided near to protect earthfilling ,road edge& cut slopes and water bodies falling within the proposed alignment. Table 11.1 gives the chainage-wise protection works adopted.

Table 11.1 List of protective works

Sl. No.	Chainage		Type of protective works		Comments
	From	To	LHS	RHS	
1	9740	9800	60		4 mtr R/Wall
2	12025	12100	75		4 mtr R/Wall
3	12300	12350	50		4 mtr R/Wall
4	12525	12575	50		4 mtr R/Wall
5	12675	13100	425		4 mtr R/Wall
6	15325	15375	50		4 mtr R/Wall
7	16050	16350	300		4 mtr R/Wall
8	16975	17000	25		4 mtr R/Wall
9	17275	17500	225		4 mtr R/Wall
10	18550	18600	50		4 mtr R/Wall
11	18700	18775	75		4 mtr R/Wall
12	18900	19089	189		4 mtr R/Wall
13	19000	19100	100		4 mtr R/Wall
14	23300	23400	100		4 mtr R/Wall
15	23650	23700	50		4 mtr R/Wall
16	24550	24650	100		4 mtr R/Wall
17	24750	24850	100		4 mtr R/Wall
18	25550	25650	100		4 mtr R/Wall
19	30250	30400	150		4 mtr R/Wall
20	31100	31200	100		4 mtr R/Wall
21	31250	31450	200		4 mtr R/Wall
22	34650	34900	250		4 mtr R/Wall
23	35050	35150	100		4 mtr R/Wall
24	35180	35250	70		4 mtr R/Wall
25	35525	35600	75		4 mtr R/Wall
26	38875	38950	75		4 mtr R/Wall
27	39230	39280	50		4 mtr R/Wall
28	39900	39982	82		4 mtr R/Wall
29	10050	10200		150	2 mtr B/Wall
30	10275	10350		75	2 mtr B/Wall
31	11000	11250		250	2 mtr B/Wall
32	13500	13525		25	2 mtr B/Wall
33	18600	18675		75	2 mtr B/Wall
34	19180	19300		120	2 mtr B/Wall
35	20160	20550		390	2 mtr B/Wall
36	21825	21900		75	2 mtr B/Wall
37	22500	22700		200	2 mtr B/Wall
38	24180	24300		120	2 mtr B/Wall
39	25700	25900		200	2 mtr B/Wall
40	29900	30100		200	2 mtr B/Wall
41	32800	32900		100	2 mtr B/Wall
42	36475	36620		145	2 mtr B/Wall

## 12. Land Requirement

### 12.1 General NOT APPLICABLE

There is no existing track . Thus the project road is a new connectivity road with no existing track.

### 12.2 Proposed ROW

The width of carriageway has been considered as 3.75 m in accordance with the IRC-SP 20: 2002. The total roadway width is limited to 6.00 m with 1.875 m earthen shoulder on either side of carriage way. The proposed ROW generally varies from 12 m – 15 m depending upon the road cut formation and the proposed ROW is even less than 10 m in some stretches of habitation area and in areas having tree plantation.

### 12.3 Additional Land

Local administration and local panchayat need to apprise the villagers about requirement of minor areas in places for development of the road. Villagers are generally highly enthusiastic during site visits for selection of the road. Table 12.1 provides the chainage-wise additional land required.

{Insert a table showing the additional land required for developing the PMGSY road}

**13. Utility shifting/relocation –N/A**

**13.1 Existing utilities**

{Insert list of existing utilities that require relocation along the project road with chainage details in a tabular form. This should connect to the decisions taken during transect walk. The existing utilities must be shown on the drawings. Utilities to be relocated must be highlighted and the new location shown on the drawings}

**13.2 {Insert list of departments responsible for utility shifting}**

**13.3 {Insert rules pertaining to shifting of utilities}**

**13.3 {Insert rules pertaining to shifting of utilities}**

**13.4 {Provide an estimate with breakdown of costs for relocation of utilities}**

Table 13.1 Estimated Cost for Relocation of Utilities

Sl. No.	Utility Type	Qty	Estimated Rate	Estimated Cost
1	{For example, power poles}			
2				
3				
Etc.				
Estimated Total Cost				Nil

## 14. Traffic Management and Road Safety Measures

-Being Stage-I shall be taken up in Stage -II

### 14.1 Road Furniture

Road Furniture details include:

- Cautionary, mandatory and information signs
- KM stones and 200m stones

#### 14.1.1 Road Markings

Road markings perform the important function of guiding and controlling traffic on a highway. The markings serve as psychological barriers and signify the delineation of traffic paths and their lateral clearance from traffic hazards for safe movement of traffic. Road markings are therefore essential to ensure smooth and orderly flow of traffic and to promote road safety. The Code of Practice for Road Markings, IRC: 35-1997 has been used in the study as the design basis. Schedules of Road Markings are included in contract drawings.

#### 14.1.2 Cautionary, Mandatory and Informatory Signs

Cautionary, mandatory and informatory signs are provided depending on the situation and function they perform in accordance with the IRC: 67-2001 guidelines for Road Signs.

Overhead signs are proposed in accordance with IRC: 67-2001.

#### 14.1.3 Kilometer Stone and Hectometer Stone

The details of kilometre stones are in accordance with IRC: 8-1980 guidelines. Both ordinary and fifth kilometre stones are provided as per the schedule. Kilometre stones are located on both the side of the road.

The details of 200m stones conform to IRC: 26-1967. 200m stones are located on the same side of the road as the kilometre stones. The inscription on the stones shall be the numerals 2,4,6 and 8 marked in an ascending order in the direction of increasing kilometerage away from the starting station. Table 14.1 gives the details of Km. stone. 5<sup>th</sup> km. stone and boundary pillars provided.

Table 14.1

**Details of Km. stone. 5<sup>th</sup> km. stone and boundary pillars**

Sl.	Name of Road	Chainage (km)	5 <sup>th</sup> . Km. stone (nos.)	Km. stone (nos.)	200m stone (nos.)	Boundary stone (nos.)
	Ganjote to Phalni	9.739-39.982	7	30	151	604

#### 14.1.4 Delineators and Object Markers

Roadway delineators are intended to mark the edges of the roadway to guide drivers on the alignment ahead. Object markers are used to indicate hazards and obstructions within the vehicle flow path, for example, channelising islands close to the intersections.

Delineators and object markers are provided in accordance with the provisions of IRC: 79-1981. They are driving aids and should not be regarded as substitutes for warning signs, road markings or barriers.

#### 14.1.5 Guard Posts, Crash Barriers and Speed Breakers

Guard posts are proposed on embankments of height more than 1.5m and bridge approaches. The spacing of guard post shall be 10.0m c/c in these areas. Typical Guard post consists of pre-cast (M20) CC post of size 200mm x 200mm and a height of 600mm above ground level. They are encased in M15 cement concrete to a depth of 450mm below ground level. Guard posts are painted with alternate black and white reflective paint of 150mm wide bands. Table 14.2 gives the details of guard posts, crash barrier and speed breakers. A layout of a typical speed breaker is given below. {Insert figures in the table below and this should be shown in the drawings also}

Table 14.2  
Details of guard posts, crash barrier and speed breakers

Sl.	Name of Road	Chainage (km)	Guard post (nos.)	Crash Barrier (m)	Speed breakers (nos)

#### 14.2 Temporary traffic control

The road under consideration has to be widened alongwith the bridges and culvert. The list below provides the c/d structures to be widened/reconstructed and temporary traffic control measures to be implemented.

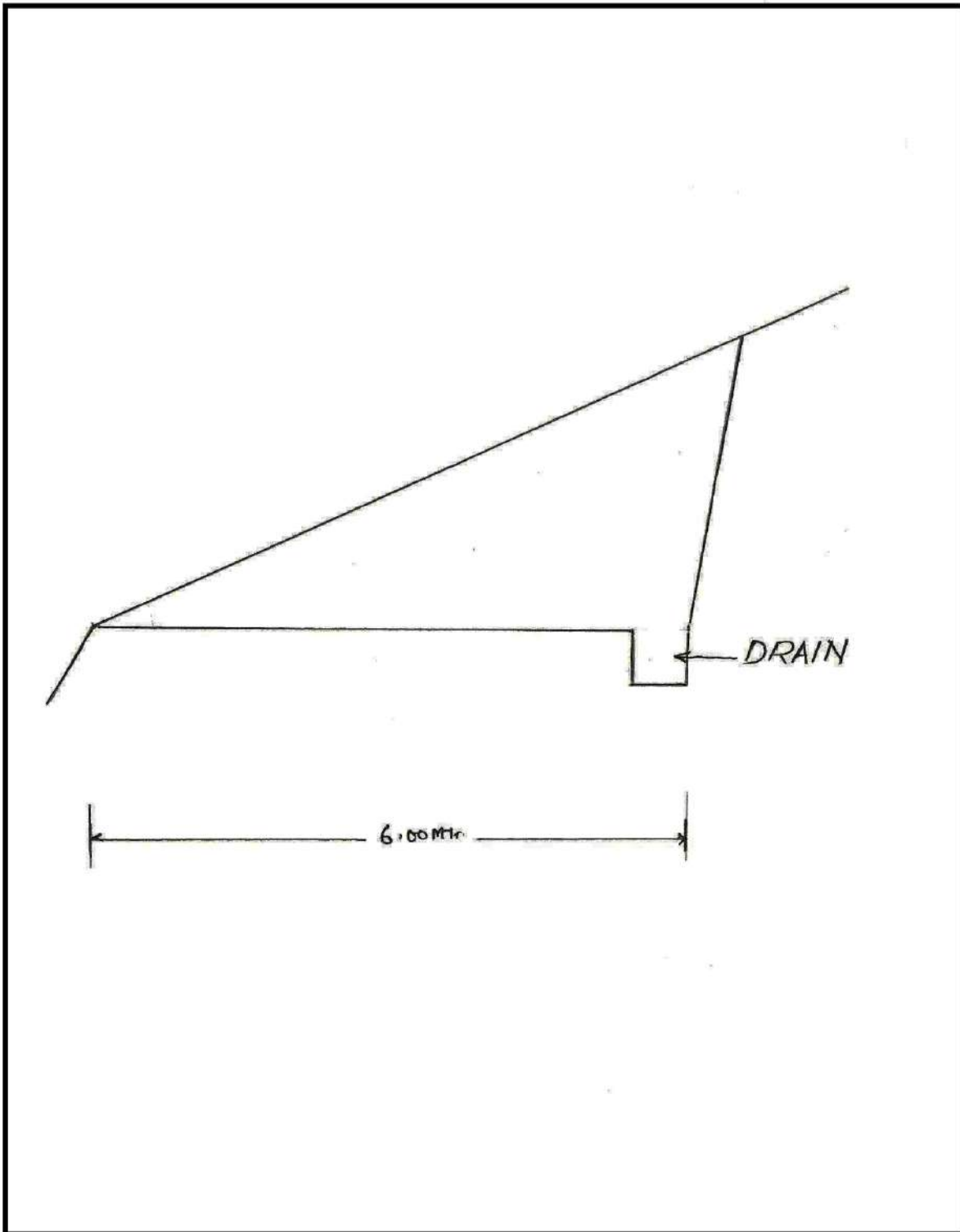
Table 14.3 gives the section-wise details of temporary traffic control measures to be adopted.

{Insert table showing section/chainages where temporary traffic control measures will be required and type of control like diversion etc.}

Table 14.3  
Details of temporary traffic control measures to be adopted

Sl.	Name of Road	Chainage (km)	Temporary traffic control measures to be adopted			

## TYPICAL CROSS - SECTION





### 14.3 Checklist for Road Safety Measures

{Insert description of road safety issues identified during design and provide details of mitigation measures adopted. Examples of mitigation measures that may be required are:

SI	Road Safety Checklist
A	A minimum 100 mm thickness of pavement GSB layer constructed to the full roadway width.
B	The upper layer of all shoulders of sub-base quality compacted to a minimum thickness of 100 mm.
C	Shoulder side slopes are not be steeper than 2H:1V unless stone pitching of the slope is provided.
D	Speed breakers as per NRRDA circular comply with the requirements of IRC:99-1988 for general traffic.
E	Speed breakers placed at the threshold of a habitation and at regular intervals (150 - 200 m) through the habitation.
F	Within densely populated habitations, a cement concrete (CC) pavement or V-shaped side drain is constructed to the full width of the available roadway.
G	Within habitations, wherever deep side drains are constructed either within or adjacent to the roadway, is covered by slabs laid level with the adjacent pavement and capable of being manually removed.
H	In habitations where child playing areas border the road, a low profile wall, raised kerb or similar form of boundary marking (depending on the site conditions), is constructed to create a physical boundary and act as a deterrent to the random movement of a child onto the road.
I	On roads where, because of the lack of dry land in the general area, the shoulder will be continually occupied and only intermittently available for traffic, speed breakers are installed at regular intervals, not more than 300 m apart, for the entire length of the road.
J	The drawings show all obstructions in the proposed road shoulder with a note that the obstruction is to be removed.
K	If a shoulder obstruction cannot be removed, hazard markers are installed to mark the Obstruction
L	Hazard markers are installed at all pipe culvert headwalls.
M	Hazard markers are installed at each end of all box culverts, river crossing causeways and similar CD structures.
N	Hazard markers are installed at any discontinuity in the shoulder.
O	Directional sight boards are installed on all sharp curves and bends.
P	Speed breakers are provided at sharp curves and bends where the curve design speed is less than 40 km/h in plain and rolling terrain, and less than 25 km/h in mountainous and steep terrain.
Q	Speed breakers are provided and directional sight boards installed at sites where reverse horizontal curves are closely spaced and speed reduction is required.
R	At a main road intersection, signs and pavement markings for STOP control on the PMGSY village road are installed, side road warning signs on the main road and intersection warning signs on the village road are installed, and speed breakers on the PMGSY village road are provided as given in the figures (refer IRC 99-1988).

This DPR may be subjected to a road safety audit by an independent third party. The recommendations of the road safety audit as approved by PIU shall be incorporated in the final DPR.}

Road safety issues identified during the design were and the mitigation measures are included in all designs and shown on the DPR drawings. Details of the issues and measures are: {Insert details in tabular format on chainage wise basis.}

## **15. Specification**

### **15.1 General**

The "Specification for Rural Roads" published by IRC on behalf of the Ministry of Rural Development, Govt. of India has been followed.

### **15.2 Construction Equipment**

Construction by manual means and simple tools has been considered for the project as per the guideline of NRRDA. For handling of bulk materials like spreading of aggregates in sub-base & base courses by mix-in-place method, use of motor grader & tractor-towed rotavator has been allowed in line with the schedule of rate for PMGSY work. Compaction of all items shall be done by ordinary smooth wheeled roller if the thickness of the compacted layer does not exceed 100 mm. It is also considered that, hot mix plant of medium type & capacity with separate dryer arrangement for aggregate shall be used for bituminous surfacing work that can be easily shifted. A self-propelled or towed bitumen pressure sprayer shall be used for spraying the materials in narrow strips with a pressure hand sprayer. Now the vibratory rollers are also being used for rapid progress.

For structural works, concrete shall be mixed in a mechanical mixer fitted with water measuring device.

The excavation shall be done manually or mechanically using suitable medium size excavators.

### **15.3 Construction Methods**

#### **15.3.1 Preparation for Earthwork**

After setting out existing ground shall be scarified to a minimum depth of 150 mm and leveled manually and compacted with ordinary roller to receive the first layer of earthwork. In filling area, existing embankment will be generally widened on both sides as per the alignment plan. Continuous horizontal bench, each at least 300 mm wide, shall be cut on the existing slopes for bonding with the fresh embankment/ subgrade material as per CI 301.7.

#### **15.3.2 Embankment work**

Material from borrow pits will be used for embankment construction as well as the approved material deposited at site from roadway cutting and excavation of drain & foundation may be used. Layer of the earth shall be laid in not more than 25 cm (loose) thick layers & compacted each layer of the soil up to 30 cm below the subgrade level at OMC to meet 97% of Standard Proctor Density.

Material for embankment and sub-grade shall satisfy the requirements of Table 300-1 and 300-2 as per the Specification for Rural Roads.

#### **15.3.3 Sub-grade**

Material from borrow pits will be used for construction of top 30 cm as sub-grade. Soil in these sections is quite good for road construction. Top 30 cm upto the subgrade level and shoulder at OMC to meet 100 % of Standard Proctor Density by proper control of moisture and by required compaction with a smooth wheeled roller.

#### **15.3.4 Sub-base**

Sub base material in the form of stone aggregates and sand as available in the area to be used in GSB Grade II layer.

#### **15.3.5 Base**

Stone aggregates will be used in base course. 63 mm to 45 mm size (Grading 2) aggregate as been proposed for the bottom layer and 53 mm to 22.4 mm (Grading 3) size has been proposed for the top layer.

#### **15.3.6 Shoulder**

Earthen shoulder shall be constructed in layers and compacted to 100% of Proctor's Density. First layer of

shoulder shall be laid after the sub-base layer is laid. Thereafter earth layer shall be laid with base layer of pavement and compacted.

#### 15.3.7 Surfacing

Slow setting bitumen emulsion will be applied as primer on water bound layer. Emulsion shall be sprayed on surface with pressure distributor. Rapid setting bituminous emulsion shall be used for Tack coat.

Premixed carpet and mixed with equivalent viscosity grade bitumen shall be laid as surfacing course. 6 mm thick Type B seal coat is considered for sealing of the premixed carpet.

#### 15.3.8 Structural Works

Following grades of concrete are proposed for Structural works and comply with MORD and IRC specifications:

- Concrete in superstructure of slab culvert – M25 Grade (RCC)
- Concrete in abutment cap, dirt wall of slab culverts – M25 Grade (RCC)
- Concretework in abutment, return wall, headwall – M15 Grade (RCC)
- Concrete below abutment, return wall, headwall – M10 Grade (RCC)

{Insert any other new specification adopted like hard shoulders and rigid pavement.}

## **16. Environmental Issues**

### **16.1 Alignment**

The proposed road has planned to be designed considering the impact on environment. Proposed road alignment follows existing pathway to the maximum extent so that huge land acquisition is not necessary for construction of the project road. Proposed road, when completed, will be an addition to the aesthetics of this rural area.

### **16.2 Environmental Sensitive Area (National Park, Wild Life Sanctuary, Protected /Reserve Forest, Wet land etc.)**

The alignment will be finalise avoiding the environmental sensitive area such as National Park, Wild Life Sanctuary, Protected /Reserve Forest, Wet land etc. It is also necessary to maintain the minimum distance of 500 m of the project road from environmental sensitive area.

### **16.3 Construction Camp**

Construction camps will be established away from forest area/water body. The minimum facilities such as water supply, sanitation, storm water drainage, solid waste management and first aid box will be provided during the construction period of the project. Necessary provision for rehabilitation or restoration after the completion of construction phase will be done.

### **16.4 Permit / Clearance required prior to commencing of civil work**

- No objection Certificate- This will be taken by PIU from SPCB.
- Forest Department- If the project road passing thorough forest land and acquisition of the same is involved and it will be taken by PIU from Forest Department
- Consent to establish (CFE) and Consent to Operate (CFO) - This is required for Plant Hot Mix Plant, WMM Plant, Batching Plant required for the project and the same will be taken by the Contractor from SPCB.
- Lease from Mines & Geology- This will be taken by the Contractor for new Stone Quarry required for the project.

### **16.5 Borrow area**

The filling soil will have to be procured from borrow pit. Borrow area will be so excavated that the lands can reused as agricultural field. The depth of borrow pit shall not exceed 450 mm (150 mm top soil included). The top soil shall be stripped and stacked and shall be spread back on the land. As far as possible the borrow pits shall not be dug close to the road embankment. The Redevelopment of borrow area will be done before closure of the same and it will be as per agreement between landowner and the Contractor.

### **16.6 Erosion Control**

Turfing of the embankment slopes and earthen shoulder to prevent erosion of slopes of the embankment, rain cuts and erosion of shoulder is being suggested.

### **16.7 Drainage**

Suitable cross drainage structures have been provided on the basis of hydrological survey of the area. So, there will be no obstruction to the natural drainage of the area. Road side drainage is also duly considered in a manner so that surface water is led to the low points and is drained through the CD structures.

### **16.8 Use of Material**

Cut back bitumen is not proposed in the project to avoid contamination with Kerosene. Bitumen emulsion is proposed for primer coat and tack coat.

## 17. Analysis of Rates

### 17.1 General

Rates for various item of works of the project have been derived from the “Schedule of Rates December,2013 for Road works, Culvert works & Carriage etc. JKSRDA and “Addendum & Corrigendum to Schedule of Rates” effective from Dec,2013. However in general the basic rates of material have been taken from source by conducting market survey and also compared with jksr2008Prepared by Design directorate of jammu. The rates of different items have been worked out inclusive of all labour charges, hire charges of Tools & Plants, Machineries and all other cost estimates for the item of work, overhead and contractor's profit @ 12.5% and 1% cess on these.

### 17.2 Basic Rate of Material

The basic rates for stone materials & river bed materials have been taken from Geological and Mining deptt of J&K Govt..

For bituminous materials, basic rate at (location) for equivalent viscosity grade bitumen and for emulsion the basic rate of (location) has been considered as suggested in from {Insert document from which the rates were taken}.

Basic rate of other materials like coarse & fine sand, are as per the latest from Geological and Mining deptt of J&K Govt.and for cement from supplier of cement on whole sale rate .

Basic rate of steel materials at Rail head of SAIL has been considered in analysis .

### 17.3 Lead for Materials

For stone aggregates and sand, lead from source to work site is calculated from the district map and block level map of core network and finalizing the same in discussion with PIU. The supply of different materials to worksite is by road. Lead for bituminous & steel materials are similarly obtained using SOR.

{ analysis of rates for item for which rates are not provided in the SOR}.

POLYGON/RANDOM RUBBLE MASONRY LAID DRY					
S NO	DISCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
1	Nallah stones for rubble masonry (stack measurement reduced by 15%)	Cum	1.15	544.50	626.18
2	Mason class 2 <sup>nd</sup> (0.16 mandays including for dressing of quoins etc.)	Day	1.03	450.00	463.50
3	Mazdoors(0.16 mandays including for dressing of quoins etc.)	Day	2.16	300.00	648.00
4	Sundries linked to WPI for all commodities	Index	0.03	500.00	15.00
5	Through bond stones	No	7	50.00	350.00
6	<b>TOTAL=</b>				<b>2102.68</b>
7	Contractor s profit and overhead charges @ 12.5 % on total				262.83
	<b>G TOTAL=</b>				<b>2365.51</b>

## 18. Cost Estimate

### 18.1 General

Cost Estimate of project has been arrived on the following basis

- Selection of Items of work
- Estimation of item wise quantities
- Analysis of Rates

### 18.2 Estimation of Quantities

All the relevant road and structure work Items will be identified as per survey, design and drawings. Following major item of works considered are given below:

- Site clearance, dismantling and earthwork
- Pavement works (GSB, WBM, Bituminous layers)
- Cross drainage structure works
- Drainage and protective works
- Utility relocation
- Road safety and furniture
- Maintenance works

Quantity of earthwork will be derived from the proposed cross section drawings. Volume of cut and fill will be obtained directly using the design package software. Quantity derived from software will be manually verified. There are some stretches of the road in cut section. The details are provided chain age wise in Table-18.1 of total cut and fill volume. The soil obtained from roadway excavation shall be used for construction of embankment and shall be paid as per item no.4. All other quantities will be computed from the drawings of finished road, miscellaneous drawings & drawings of CD Structures.

### 18.3 Abstract of Cost

Unit rates will be derived by using the “Schedule of Rates for Road Works, Culvert works and Carriage etc. { JKRRDA}”. The abstract of Cost estimate is given in the Table below.

S.No	Description of Item	Unit	Quantity	Rate (Rs)	Amount (In Lacs)
1	<b>Earthwork in excavation in hilly terrain</b>				
a.	All kinds of soil	Cum	382034	115	439.34
b.	Ordinary rock not requiring blasting	Cum	254690	201	511.93
c.	Hard Rock	Cum	212241	343	727.99
d.	Earth filling in embankment	Cum	13059	58	7.57
e.	Disposal of excavated mulba including Loading, unloading av. Lead 1km	Cum	84896	50	42.45
				T=	1729.28
2.	<b>C.D Works</b>				
a.	Const. of 1.0 Mtr Dia HP Culvert	No	70	2.76	193.2
b.	Const. of 2m span RCC Culvert	No	11	8.36	91.96
c.	Const. of 3m span RCC Culvert	No	12	11.63	139.56

d.	Const. of 6m span RCC Culvert	No.	6	26.05	156.3
e.	Const. of 6.00 Mtr Long Scupper	No.	19	5.58	106.02
				T=	687.04
3.	Const. of Semi Pucca Walling:-				
a	Semi Pucca R/Wall Av. Height 3.0 m	Rmt			
b.	Semi Pucca R/Wall Av. Height 4.0 m	Rmt	3276	18608	609.59
c.	Semi Pucca B/Wall Av. Height 2.55 m	Rmt	2125	5615	119.31
d.	Parapets	No.			
				T=	728.90
4.	Providing & Fixing of PMGSY Boards:-				
a	P/F of Citizen Informatory Board	Each	7	14494	1.01
b	P/F of PMGSY Logo after every 2Km	No.	15	10000	1.50
c	P/F Road Sign Boards @ 3Nos/Km	Each			
d	P/F Kilo Meter Stones Ordinary	Each			
e	P/F 200 Mtrs Stones recast	Each			
f.	P/F Boundary Pillars In RCC M-15 @ 100 Mtr C/C	Each			
g.	Provision for tracer path cutting including survey and setting out etc.	Km	30.24	27000	8.16
h.	Provision for CBR Tests Including Preparation of DPR	LS	-	-	0.30
				T=	10.98
				G.TOTAL	3156.20 Lacs

18.4 Maintenance : **Being stage –I DPR, shall be reflected in stage-II DPR**

Cost of Annual Maintenance for five years after completion of project will be estimated as per the PMGSY Guidelines. Different activities of ordinary repairs are done as and when.

{Insert total Cost of 5 year Routine Maintenance Works in Format F6}.

## 19. Construction Program

### 19.1 General

Assuming that the Construction of the Batch – {I} roads will start from {Insert possible construction date.} This is a high rainfall area and rainy season extends from April to September. However, the construction program is based for a total working period of 12 months, considering the program set out by MoRD. Generally, dry working season of about 8 months are required for construction of PMGSY roads. However, works will be affected for the monsoon during the month June to September.

It is anticipated that some activity like collection of materials, CD works etc. will continue in monsoon period also.

ACTIVITY		MONTH																	
		2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36
Setting of site office & laboratory		■																	
Possession of site,identifying alignment RDs,drain crossings& causeways		■																	
ACTUAL EXECUTION	Earthwork		■	■	■	■	■	■	■	■	■	■	■	■	■	■			
	CD work					■	■	■	■	■	■	■	■	■	■	■			
	Protection Work						■	■	■	■	■	■	■	■	■	■	■		
Furnishing & completion of work																■	■	■	■

### 19.2 Realistic duration

30 working months



**Community Consultation Checklist – Engineering**

Question	Yes	No	N/a
<b>1. Are there any flood prone areas on the road?</b>			
If yes:			
1.1 Are locations specified and inspected?			
1.2. Is high flood level specified for each stretch?			
1.3 Are locations specified and inspected?			
<b>2. Are there any locations on the road where irrigations ducts need to be provided?</b>			
If yes:			
2.1 Are locations specified and inspected?			
<b>3. Can the road be used as a shortcut by through traffic?</b>			
<b>4. Does the road lead to any quarries, mining areas, brick kilns, logging areas, tourist attractions etc.?</b>			
<b>5. Are there plans to build new schools, hospitals, temples etc</b>			
<b>6. Is there potential for double connectivity?</b>			
If yes on any of 3-6:			
6.1 Is information on location, size and nature of additional traffic generators and specific routes obtained?			
<b>7. Is there a need for deviations from existing track?</b>			
If yes:			
7.1 Were the proposals for deviation shown on site and explained to the community?			
7.2 Is the land availability checked?			
7.3 If there is a need for donation, were the owners consulted regarding their agreement to donate the land?			
<b>8. Is there a need for speed breakers?</b>			
If yes:			
8.1 Is location and rational for speed breakers identified?			
8.2 Is rationale verified and checked on site?			
8.3 Are alternative or additional locations discussed?			
<b>9. Are all existing intersections checked with the community on site?</b>			
9.1 Is the use of intersecting roads identified (e.g. school children, farm machinery, etc)?			
<b>10. Are proposed culvert locations verified with the community?</b>			
10.1 Is there a need for additional culverts?			
10.2 If yes, are locations identified?			
<b>M</b>			
11.1 If yes, are locations identified?			

For DPR consultant	For PIU	For PIC
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**PRADHAN MANTRI GRAM SADAK YOJANA**  
**CHECK LIST FOR P.I.U. & S.T.A.**

**To be filled in by PIU**

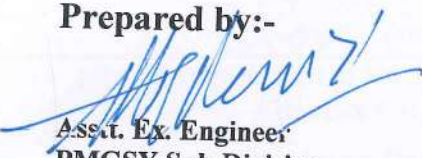
1	Location : State J&K	District: Reasi	Block: Mahore
2	Package No JK - 14		
3	Name of Road : From : Ganjote to Phalni (Part-II) upto Hassot.		
4	Length (Kms): Total: 30.242 Kms. In built up area: 2.2 Kms. In open area: 28.042 Kms.		
5	Estimated cost:- <del>3156.2</del> lacs		Cost/Kms :Rs <del>104.37</del> lacs
6	Type of Proposal:	2289.62 lacs 75.71 lac/km New connectivity	
*	If the proposed road is a New Connectivity	Yes	
-	Is the road is the part of core network	L039	
-	Name of the un-connected habitation (to be cross checked with CN-6)	Bagai, Chakal, Chana, Chatal, Dobatal, Dogian, Hassot, Kotli, Nehosi, <del>Phalni</del>	
-	Does the proposed road lead up to the habitation for which it is supposed to provide connectivity (in other words are you sure that the road is not being made partially?)	Yes	
-	Does the proposed road connect the un-connected habitation to	(a)	(b)
	a) Another Habitation having all weather road b) Directly to an All-weather road If (b), indicate the nature of road to which proposed road leads.	RR	MDR SH NH
*	If the Proposal is for Up-gradation	Yes/No	
-	Is the road apart of the core network	Yes/No	
-	Is it associated Through Route or not (in case if it is not associated TR)		
-	Whether		
-	PCI has been done	Yes/No	
-	Age of road given	Yes/No	
-	It is certified that there are no other un-connected habitations in the District.	Yes/No	
	Population sub-served by the proposed road	5812 Souls	
7.	(a) Whether the proposed road has the desired carriageway width, Roadway width and road land width (RL.W)	Yes /No	
	(b) Indicate the actual widths of the following for the proposed road.	In the Built up area (m)	In the open area (m)
	(i) Carriage way	3.00	3.00
	(ii) Roadways	6.00	6.00

	(iii) Road land width	Varies					12.00			
8.	Base year traffic volume									
									Total	
Bus /Truck	LCV/Mini Bus	Cars/ Vans Jeeps	Three Wheelers	Two Wheelers	Cycle Ricks haw	Cyc les	Bullock Carts	Motorized	Non- Motoriz ed	
9.	Growth rate adopted (%)		6.00%		Project traffic:			CVPD		
10.	Sub Grade CBR									
	Chainage	Km		Km				Avg.		
	Design CBR (%)	%		%				%		
11	Cost details:									
	(a) Clearing and Grubbing									
	(b) Pavement Components									
	For Black Top				For unsealed					
	Item	Thickness		Co.t (Rs.)	Item	Thickness (mm)		Cost (Rs.)		
	Earthwork				Earthwork	993.28		1543.16 Lacs		
	Subgrade Preparation (GSB)				Subgrade Preparatio n					
	WBM-1				Wearing surface					
	WBM-2									
	WBM-3									
C.	Bituminous Layers									
	Prime coat			--				--		
	BM/BBM			--				--		
	Tack Coat			--				--		
	MSS			--				--		
	PMC with Seal Coat									
E.	CD Works	No. of existing CD works								
		Do they require any improvement								
		Yes/No								
		If yes, cost of improvement								
		No. of proposed CD works								
		118 Nos								
		Cost of proposed CD works								
		667.94 Lacs								
		652.50								
F.	Protection work	Length:		5401 Rmt	Cost:		728.70 Lacs			
				5400			635.18			
G.	Pucca side Drains (if provided)	Length:		Rmt	Cost		Lacs			




1.	Road Logo, other Road furniture	Cost <del>11.98</del> lacs 8.66 lac
	Total =	3156.20 lacs
1.	Five Year Routine Maintenance	Yr 1 Yr 2 Yr 3 Yr 4 Yr 5 Cost <u>Re. 2289.62</u> lacs % of Const. Cost @ 75.71 lac/km
12.	Whether the road has Geometric as per Rural roads manual (RRM)	Yes
13.	Whether CD works/protection work are provided as per RRM.	Yes
14.	Whether the cost estimates are as per standard data analysis and SSR	Yes
	Certified that information provided is true	


Prepared by:-

  
Asst. Ex. Engineer  
PMGSY Sub-Division  
Arnas.

Checked by:-

  
Executive Engineer  
PMGSY Division  
Mahore.

Scrutinized by:-

  
Superintending Engineer  
PMGSY Circle  
Reasi.

Ganjote - Phalun (Part II)  
upto Hassot.

To be filled by S.T.A

Name of the STA: SCET JAMMU.

15	If the proposal is for new connectivity	Yes / No
	▪ Have you satisfy yourself that the proposed road is a part of the Core Network.	Yes / No
	▪ Is the unconnected habitation (s) part of list of unconnected habitation as per CN - 6	Yes / No
	▪ Does the proposal ensure full connectivity of the target habitation	Yes / No
16	Are you satisfied width the following	Yes / No
	▪ Engineering Survey	Yes / No
	▪ Soil Material Investigation	Yes / No
	▪ Traffic Survey / Estimation	Yes / No
	▪ Hydraulic Studies	Yes / No
17	Is the design of the following elements as per roads Manual:	Yes / No
	▪ Alignment & Geometric	Yes / No
	▪ Pavement Design	Yes / No
	▪ CD Work and protection Measures	Yes / No
	▪ Side Drains	Yes / No
	▪ Drainage Layers	Yes / No
18	Does the estimation confirm to standard rate analysis and SSR	Yes / No
19	Does the proposal have provision for	Yes / No
	▪ PMGSY Logo Sign Boards	Yes / No
	▪ Km / Hm Stones.	Yes / No
	▪ Guard Stones (where necessary)	Yes / No
	▪ Traffic Sign board (as per necessary)	Yes / No
	▪ 5 year routine maintenance, estimate on lump-sum basis	Yes / No
20	Specific Remarks, if any by STA <u>STAGE - I.</u> Length of said road as per C.N = 50 km. In Part-I, sanctioned road length (under Phase - I) is 9.74 km. In Part II proposed road length to reach (30.242 km)	

Certified that the Design and Estimation for the proposed roads work are based on the Data and SSR provided by Engineers. The Proposal may be cleared.  
Target habitation Hassot. The last Target habitation Phalun is

Technical Scrutiny said to be already Done by connected by a PWD road.  
Coordinator  
S.T.A.

Signature :

Name :

Designation :

Signature 17/03/2017  
(DR. S.K. GUPTA)

Name :

Designation :