

**GOVT OF JAMMU & KASHMIR**



**I&K RURAL ROADS DEVELOPMENT AGENCY**  
**(BHARAT NIRMAN)**



**PRADHAN MANTRI  
GRAM SADAK YOJANA**

**DISTRICT JAMMU (I&K STATE)**

**NAME OF THE ROAD** : Tanda To Kapai Di Bhan (Part -- 2).  
**BLOCK** : AKHNOOR  
**PACKAGE NO** : JK05-166  
**LENGTH** : 5.950 K.M.  
**ESTIMATED COST** : 778.68 lacs.  
**FIVE YEAR MAINTENANCE COST** : 62.29 lacs.

- 8d -  
 Executive Engineer  
 RMGSY Division  
 Jammu

## 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 Roads

An all-weather road is one which is negotiable during all weathers, with some permitted interruptions. Essentially this means that at cross-drainage structures, the duration of overflow or interruption at one stretch shall not exceed 12 hours for ODRs and 24 hours for VRs in hilly terrain, and 3 days in the case of roads in plain terrain. The total period of interruption during the year should not exceed 10 days for ODRs and 15 days for VRs.

### 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 High ways. 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 centers, 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 said road project **Tanda To Kapai Di Bhan** is a Link Route with road Code **L023** in block **Akhnoor** of District **Jammu**. This road takes off from Tanda and ends at Village Kapai Di Bhan, It directly connects the habitations Kapai di Bhan(360), Khungan(104), Kotli(206), with total population of **570**, the population is scattered all along the alignment with many links & small lanes originate from the said road.

The Stage 1<sup>st</sup> of the Said Road was already sanctioned under Phase Xth upto the length of **3.00Km**, but the habitation **Kapai Di Bhan** is still unconnected, To connect this target Habitation, **Part 2** of the said road is proposed for a length of **5.950 Km**.

### 1.5 Climatic Condition

This area falls in subtropical temperature region, having average minimum temperature of 12 C & maximum temperature of 32C, however extreme minimum temperature falls to 1.00C and maximum temperature shoots to 45C. The climate is moderate to cold in winter and dry in summer. Rainfall depends upon the monsoons but local rains are also encountered.

### 1.6 The Sub-Project Road

The road passes through rolling/hilly terrain.

District: JAMMU  
 Block: AKHNOOR  
 Road Name: Tanda To Kapai Di Bhan Part 2.  
 Road Code: JK51L023  
 Package No: JK05-166  
 Road Length: 5.950 K.m.

Start Point: 32.594 , 74.413

End Point: 33.026 , 74.711

Sl.No.	Habitation benefited	Population benefited		Chaniage	
		Direct	Indirect	From	To
1	Kotli	206	509	RDO	
2	Khungan	104			
3	Kapai Di Bhan	206			

Rainfall Data as applicable for the project road were collected with maximum rainfall occurring in the months of July and August.

**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.

**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.

**7.2 Terrain**

The classification of terrain was selected from plain/rolling/hilly/steep classification for which following criteria will be applicable.

<b>Terrain classification</b>	<b>Cross slope of the country</b>
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Rolling	10-25%	1 in 10 to 1 in 4
Mountainous	25-60%	1 in 4 to 1 in 1.67

**7.3 Design Speed**

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

Road classification	Rolling terrain		Mountainous terrain	
	Ruling	Min.	Ruling	Min.
Rural Roads (ODR and VR)	40	35	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)	15	15-25	15	15-20	12	12	12	9

**7.5 Roadway Width**

Roadway width for this road is given below

Terrain Classification	Roadway Width (m)
Plain and Rolling	8.50
Mountainous and Steep	8.50

**7.5 Carriageway Width**

The width of carriageway for this project road is 3.75m

**7.6 Shoulders**

It is proposed to have {1.5 m and 1.125 m} wide shoulder as the case may be on both sides of which at least 0.875m is hard shoulder where required.

**7.8 Roadway width at cross-drainage structures**

The roadway width at culvert locations for this road is 6.0m in mountainous terrain.

**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
30	30
40	45
50	60

### 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
Plain	90	60

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 minimum super elevation is 4.0% 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	3.5	4.0
Thin bituminous road	3.0	3.5
Rigid Pavement	2.0	2.5

### 7.12 Vertical Alignment

The present road is in plain 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	2:1
Embankment in clay or clayey silt or inundated condition	2.5:1 to 3:1
Cutting in silty/sandy/gravelly soil	1:1 to 0.5:1
Cutting in disintegrated rock or conglomerate	0.5:1 to 0.25:1
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 High way design is to identify technically sound, environment-friendly and economically feasible High way alignment. The ensuing sections deals with obligatory points, which control High way alignment, design of cross-section, High way geometric design & methodology, design of miscellaneous items.

The main components included in the High way design are:

- Cross-sectional elements

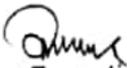
**BHARAT NIRMAN**  
**PRADHAN MANTRI GRAM SADAK YOJANA (PMGSY)**  
**ABSTRACT OF COST**

Name of the Road :- Tanda to Kapai-di-bhan Part 2  
 :- Akhnoor  
 :- JAMMU

PACKAGE No. :- JKO5-166  
 Length of Road :- 5.950 KM

Sl. No.	Items	Quantity	Unit	Rate	Amount (Rs. in Lacs)	
1	Site Clearance	5.950	Hectare	14130.00	0.84	
2	Earth Work in Excavation	85400.00	cum	159.30	136.04	
3	Earth Work in filling	24786.00	cum	58.00	14.38	
4	Preparation of subgrade	5965.85	6251.07	35.00	2.19	
5	GSB Grade -I	2487.75	2604.61	657.00	17.11	
6	WBM Grade -II	1423.66	1447.86	1017.00	14.72	
7	WBM Grade -III	1355.87	1378.91	998.00	13.76	
8	Primer Coat	18385.50	sqm	51.00	9.38	
9	Tack Coat	18385.50	sqm	18.00	3.31	
10	20mm thick Open Graded Premix Carpet.	18385.50	sqm	154.00	28.31	
11	Seal Coat	18385.50	sqm	59.00	10.85	
12	Berm Fillings	2445.55	4914.70	280.00	13.76	
10	Carriage item (5 - 12)		106.02			
a)	Granular Sub-Base	2485.77	2604.61	335.98	8.75	
b)	Stone Aggregate	4151.63	4211.89	287.32	12.10	
c)	Bitumen		60.03	558.86	0.34	
12	Retaining wall				276.14	
a)	2.00 Mtr. Height		490.00	7802.85	38.23	
b)	3.00 Mtr. Height		235.00	12273.56	28.84	
c)	4.00 Mtr. Height		280.325	18284.22	51.19	
13	Breast Wall		845935.00	6158.39	52.03	
14	1.5Mtr. Height Edge wall.		445.00	6425.93	7.39	
15	Parapet		1450.00	1591.74	23.08	
16	Pucca Drain		795.00	1385.83	11.02	
17	Pucca Drain with slab		75.00	3762.74	2.82	
18	Deep Drain with edge wall		50.00	4224.18	2.11	
19	Wire Crates (Gabions)	299.56	155.00	19512.75	30.24	
20	1.0M Span Existing Link Road crossing		5.00	157845.24	7.89	
21	1.0M dia. HPC.		18.00	1.93	34.67	
22	1.50M Span RCC culvert.		7.00	6.41	44.88	
23	2.0M Span RCC culvert.		4.00	8.10	32.38	
21	3.0M Span RCC culvert.		2.00	9.38	18.76	
22	Vented Cause way (2 No.)		50.70	2.47	125.41	
23	Flush Cause way (6.0 mtr. Span)		1.00	4.13	4.13	
24	Road Safety and Traffic Sign Board and logo boards		34	260.23	2.10	
25	Setting out Referenc, Back, Job pillars, DPR Preparation.		53.57	499.79	2.75	
				778.68	Total	778.817.47
						62.29
23	5 Year Maintenance Cost					65.40
				765.53 + 14.38 = 779.91		
				= 62.39		
				= 842.30 lacs		
					Total	882.87
						840.97 lacs

  
 Asstt. Executive Engineer  
 PMGSY Sub-division -II  
 Jammu

  
 Executive Engineer  
 PMGSY Division  
 Jammu

## BHARAT NIRMAN

### Typical Estimate For BT Pavement.

Name of the Road :- Tanda to Kapai-di-bhan Part 2

BLOCK :- Akhnoor

DISTRICT :- JAMMU

PACKAGE No. :- JKO5-  
Length of Road :- 5.950 KM

S. No	Description	L	B	H	Total	Quantity	Unit	Rate / Unit	Amount (Rs. in Lacs)
1	Preparation of subgrade by way of compacting original ground supporting subgrade, loosening of the ground upto a level of 300mm below the surface level, watered, graded and compacting in layers to meet the requirement of the table 300.1 and 300.2 for subgrade construction as per technical specification clause 303.5.2 Add 3% for curves.	5850.60	3.30	0.300	5890.50	5965.85	CuM	35.00	2.19
		5950.00			6069.00				
		Total			173.76				
								2.08	
2	Granular Sub-Base GSB grade- I Construction of Granular Sub-base by providing well graded material, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with smooth wheel roller to achieve the desired density, complete as per Technical Specification Clause 401. Add 3% for curves.	5850.60	3.30	0.125	2413.37	2485.79	CuM	657.0	16.33
		5950.00			2528.75				
		Total			72.40				
								16.61	
3	Water bound macadam with crushable WBM grade- II Providing laying spreading and compacting stone Aggregate Of specific sizes to water bound macadam specification incl. spreading in uniform thickness hand packing rolling with three wheel 80-100Kn static roller in stages to proper grade and camber applying and brooking crushable screening to fill up the interstices of coarse Aggregate Watering and compacting to the required density grading 2 as per technical specification clause 405 of MOST.	5850.60	3.15	0.075	1382.20	1425.66	CuM	1017.00	14.48
		5950.00			1405.7				
		Total			2485.79				

**BHARAT NIRMAN**  
**Typical Estimate For BT Pavement.**

Name of the Road :- Tanda to Kapal-di-bhan Part 2

BLOCK :- AKHNOOR

DISTRICT :- JAMMU

PACKAGE No. :- JKO5-  
Length of Road :- 5.950 KM

S. No	Description	L	B	H	Total	Quantity	Unit	Rate / Unit	Amount (Rs. inLacs)
	Add 3% for curves.			41.46	42.17				
	<b>Total</b>		1423.66		1447.86				
4	<b>Water bound macadam with crushable WBM grade- III</b> Providing laying spreading and compacting stone Aggregate Of specific sizes to water bound macadam specification incl. spreading in uniform thickness hand packing rolling with three wheel 80-100Kn static roller in stages to proper grade and camber applying and brooking crushable screening to fill up the interstices of coarse Aggregate Watering and compacting to the required density grading 2 as per technical specification clause 405 of MOST.	5850.60			1316.38	1378.91	CuM	998.00	43.76
	Add 3% for curves.	6950.0	3.00	0.075	1338.75	1355.87			13.53
	<b>Total</b>		39.49		40.16				
	<b>Total</b>		1355.87		1378.91				
5	<b>Primer Coat</b> (1) Low Porosity Providing and applying primer coat with bitumen emulsion (SS-1) on prepared surface of granular base including cleaning of road surface and spraying primer at the rate of 0.70-1.0 Kg/Sqm using mechanical means as per technical specification clause 502 of MOST.								
	Add 3% for curves.	5950.0	3.00	-	17850.00	18385.50	Sqm	51.00	9.38
	<b>Total</b>				535.50				
	<b>Total</b>				18385.50				
6	<b>Tack Coat</b> Providing and applying tack coat with bitumen emulsion (RS-1) using emulsion distributor at the rate of 0.25 to 0.30Kg per Sam on the								

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**Typical Estimate For BT Pavement.**

Name of the Road :- Tanda to Kapai-di-bhan Part 2

BLOCK :- Akhnoor

DISTRICT :- JAMMU

PACKAGE No. :- JKO5-  
Length of Road :- 5.950 KM

S. No	Description	L	B	H	Total	Quantity	Unit	Rate / Unit	Amount (Rs. in Lacs)
	prepared granular surface treated with primer and cleaned with hydraulic broom as per technical specification clause 503 of MOST.	5950.0	3.00	-	17850.00	18385.50	Sqm	18.00	3.31
	Add 3% for curves.				535.50				
	<b>Total</b>				<b>18385.50</b>				
7	<b>20mm thick open graded premix carpet</b> providing laying and rolling of open graded premix carpet of 20mm thickness composed of 13.2mm to 5.6mm Aggregate Withier using penetration grade bitumen or emulsion to required line grade and level to serve as wearing course on a previously prepared base including mixing in a suitable plant, laying and rolling with a three wheel 80-100KN static roller capacity finished to required level and grades to be followed by seal coat type B as per technical specification clause 508 of MOST. By hot mix plant and pavers.	5950.0	3.00	-	17850.00	18385.50	Sqm	154.00	28.31
	Add 3% for curves.				535.50				
	<b>Total</b>				<b>18385.50</b>				
8	<b>Seal Coat</b> Providing and laying of seal coat sealing the voids in a bituminous surface laid to the specified levels, grade and cross fall using type B as per Technical specification clause 510 of MOST. By Manual Means (type-B). Add 3% for curves.	5950.0	3.00	-	17850.00	18385.50	Sqm	59.00	10.85
	Add 3% for curves.				535.50				
	<b>Total</b>				<b>18385.50</b>				

**BHARAT NIRMAN**  
**Typical Estimate For BT Pavement.**

Name of the Road :- Tanda to Kapai-di-bhan Part 2

BLOCK :- Akhnoor

DISTRICT :- JAMMU

PACKAGE No. :- JKO5-  
Length of Road :- 5.950 KM

S. No	Description	L	B	H	Total	Quantity	Unit	Rate / Unit	Amount (Rs. in Lacs)
	<b>Total</b>				18385.50				
9	Berm filling with approved material obtained from borrow pits with a lifts upto 1.50m transporting to site, spreading, grading required slope and compacted with a lead upto 1000m asper Technical Specification clause 301.5 width = $(6.0 - (3.4 + 3.0)/2) = 2.80m$ .	5850.60 6960-0	2.80 1.90	0.205 0.22	2445.55 4914.70	2445.55 4914.70	CUM	280.00	6.84 <del>13.76</del> 6.96
	<b>Total</b>				4914.70				
								<b>Total</b>	<b>113.39</b>

~~106.82~~  
105.11

  
Asstt. Executive Engineer  
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