

REPORT

1.00

This Detailed Project Report has been framed to access the cost of Construction of Bypass for Gumla Town connecting NH-23 to NH-78 Road. The Detailed survey, Soil Investigation and testing of soil samples and traffic census of the road for various design purposes has been done by team of engineers of Planning and Investigation Division, Road Construction Department, Ranchi. Based upon C.B.R. Value of the under lying soil strata and Traffic volume intensity on the road, this Detailed Project Report has been prepared, which may be summarized as follows:

1. Name of the road	: Construction of Bypass for Gumla Town connecting NH-23 to NH-78
2. Authority and plan provisions	: Chief Engineer, C.D.O., R.C.D. Jharkhand Memo No.613 Dt.19.07.10
3. State	: Jharkhand
4. Department	: R. C. D.
5. Circle	: NH Circle, Ranchi.
6. Division	: NH Division, Gumla.
3. Chainage "0" at	: Silam on NH-78
4. Present carriageway width	: Nil
5. Proposed carriage way width:-	: 7.0 m+2X1.5m
6. Proposed Formation width	: 12.0m
7.(a) Camber of Flexible Pavement:-	: 2.50%
7.(b) Camber of Rigid Pavement:-	: 2.00%
8. Camber of the Earthen shoulder:-	: 3%
9. Superelevation at bends	: As per requirements of the horizontal curves
10. Actual length of the road section:-	: 12.842Km.
11. Embankment slope :-	:
In filling	: 2:1
In cutting	: 1:1
12. Termination point of the road section:-	: 5th km from Gumla (Bahmani village on NH-23, towards Ranchi)
13. Total No. of existing Bridges	: 2
14. Total No. of existing Bridges to be retained :	: Nil
15. Total No. of existing Bridges to be replaced :	: 2
16. Total No. of proposed new Bridges	: 6
17. Total No. of Existing culverts	: 12
(i) Existing to be retained with widening	: Nil
(ii) Existing to be replaced	: 12
17. Proposed New Culverts	: 21

A. H. S. S. S.
14.08.16
Assistant Engineer
Quality Control
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18. (a) Total length of R.C.C. drains	Nil
(b) Total length of Masonary drains	Nil
19. Total length of retaining wall	Nil
20. Existing Right of Way	N.A.
21. No. of Electric Telephone poles/Transformers to be shifted	0
22. Stretch passing through forest area	N.A.
23. Thickness of the Existing crust (excluding - premix carpet)	Nil
24. (a) Proposed Length of Flexible pavement	12.842 Km.
(b) Proposed Length of Rigid pavement	Nil
25. Design Thickness of the crust (Rigid)	N.A.
26. Design thickness of the crust (Flexible)	40mm BC over 130mm DBM over 250mm WMM over 300mm GSB Gr.-I
26. Design Life : Flexible Pavement	15 years
27. 4 days soaked CBR adopted for Design	5.00%
28. Design Traffic intensity	1591 CVPD
29. Crust composition provided as per IRC:58-2002 & IRC-37:2001 Flexible Pavement :- Reconstruction Part	Nil

Assessed
Pm
 14.06.16
 Assistant Engineer
 Quality Control
 National Highway Division
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1.02 PROJECT COST

The estimated project cost is Rs.8712.303 (Rupees eighty seven crores Twelve lakhs thirty thousand three hundred) only. The estimate has been framed on the basis of current schedule of rates of Road Construction Department, Government of Jharkhand effective from 01.04.2013. The cost per Km. comes to Rs.459.50 Lacs.

1.03 AUTHORITY AND PLAN

The DPR of the road has been prepared in the light of order issued by Chief Engineer, C.D.O., R.C.D., Ranchi vide his memo no.613 dt.19.07.2010 under the head 5054 (TSP-Road)

2.00 PROJECT STANDARD, SPECIFICATION AND GUIDELINES

2.01 ROAD STANDARD AND SPECIFICATIONS

The road is proposed to be constructed as per the standards of state highways laid down by the I.R.C. and specifications for road works as per MORT&H, Government of India.

2.02 DESIGN AND DRAWINGS

Flexible pavement as per IRC- 37:2001 whereas the design of drains and cross drainage

3.00

TRAFFIC SURVEY

Origin & Destination(O-D Survey) traffic survey has been conducted at three points; near Salem(on NH-78) , near Dumardih(on NH-23 towards Palkoat)and near Gumla(on NH-23,towards Ranchi).It is obvious from the result of traffic census that the percentage of freight vehicles that will prefer travelling through the proposed Bypass is more than 90% and percentage of passengers vehicles may be more than 60%.ACVD and PCU for three stations are 1377cv/day,5415,503cv/day,2126 and 988 cv/day,4268 respectively.

Attested
[Signature]
14.06.16
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DESIGN AND DRAWINGS

4.01 DESIGN OF PAVEMENT FOR RECONSTRUCTION

The flexible pavement has been designed in accordance with IRC:37-2001.In CBR Method of Design Traffic is defined in terms of cumulative no. of standard axles(8160Kg.) to be carried during design life of the road.It is well known that the structural damage caused by a vehicle depends on the axle load it imposes on the road and equivalent axle load concept is the best method available for design purposes to handle the large spectrum of axle load actually applied to a pavement.The pavement thickness is calculated with the help of design curves/tables/blocks, relating pavement thickness to the cumulative no. of standard axle to be carried for different sub grade strength values in terms of the CBR values of the subgrade. The thickness thus deduced are total thickness of pavement consisting of various combination of bituminous surfacing, granular base and sub base thickness.

4.02 DRAWINGS

Drawing such as Plan Longitudinal section, Typical cross section, detailed cross section, section of drains, guard walls and cross drainage works have been prepared in accordance with IRC:SP-19-2001

5.00 DESCRIPTION OF THE PROJECT & PROPOSED CONSTRUCTION

The existing road falls under the jurisdiction of NH Division ;Gumla. The road originates from Salem village on NH-78 and terminates at Bahmini Village on NH-23,towards Ranchi.The Proposed road is new alignment combination of existing village Road and virgin alignment.The entire stretch is Rollin terrain.with view to crossing of vehicles without using shoulder, the provision of road to 7.0m carriageway and 1.50m Paved shoulder has been made.This will insure safe movement of vehicles through Bypass.Quarry chart for the procurement of stone metal, stone chips and other materials required for the construction of the project has been obtained from NH Division(works) Gumla.

Attested
14.06.16
Assistant Engineer
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5.01 HISTORY, GEOGRAPHY, CLIMATE, NECESSITY OF THE ROAD AND PROPOSED SPECIFICATION

The road basically falls under the jurisdiction of NH division Gumla. In fact the junction point of NH-78 and NH-23 falls in heavily crowded area of Gumla Town. Vehicular traffic plying on NH-23 and NH-78 very often face jam problem after entering into the town area. Their smooth travel often gets disturbed due to frequent jams and accidents while traversing this segment. Local people and their representatives have raised the demand for construction of a BY PASS of GUMLA town. In the light of fact stated above this DPR has been prepared. It is pertinent to mention here that the existing alignment of NH-78 consists of two segment with steep gradient where the Loaded vehicles find it very difficult to traverse this segment. By constructing the proposed by pass, this problem will automatically get solved. The proposed By Pass originates from Silam village on NH-78 and meets NH-23 towards Birmitrapur near Dumardih village and finally terminates near Bhamani village on NH-23 towards Ranchi. Five soil samples per Km. have been collected and tested for various soil parameters including CBR. Perusal of soil report reveals that CBR of major stretches is 5.0% or above except in 10th, 11th, 12th, 13th Km. where only few samples have indicated CBR of soil adjoining area less than 5.0%. The construction of Embankment in these Kms. should also be done with soil of CBR 5.0% or more which is available within the lead provided in the rate of E/W for embankment construction.

6.0 Climatic Conditions :-

The Climatic and Geographical condition of the region is almost similar to other regions of Jharkhand. The road region fall in semi arid zone.

7.0 Economic profile of the region and road influence area

The road passes through Rural areas. The road will provide inhancement in forest related business activities in the area.

8.0 Route selection and Alignment:- Three possible alignment was explored through reconnaissance survey and the merit and demerit of every alignment was discussed with Chief Engineer NH wing, R.C.D. Jharkhand and Regional Officer, NH, Jharkhand. After detailed discussion and inspection of the alignments by the Regional Officer, NH, Jharkhand, this alignment has been finalised.

9.0

MATERIALS

Sl. No.	Material	Place	Av. Lead (Km.)
1	Boulder	Karaundhi	8
2	Metal	Karaundhi	8
3	Chips	Karaundhi	8
4	Moorum	Local	5
5	Sand	Nagfeni river	13
6	Steel	Gumla	8
7	Cement	Gumla	8
8	Bitumen	Namkum	111

11.0

LABOUR

Skilled, Semi skilled and unskilled labours are available in abundance in the region.

12.0

QUALITY ASSURANCE / QUALITY CONTROL

To achieve high quality in construction the execution of the project should be assigned to efficient and reputed contractors and effective monitoring should be done by official of Road Construction Department. The officials whether from the contractor side or from the Government side should be given sufficient training to know the essentials of quality construction. The responsibility of achieving quality in construction should be assigned to these trained officials. A provision of 1% of the estimated cost has been made exclusively for QUALITY CONTROL AT SITE during execution of the project.

Site laboratory fully equipped and functional as MOSRT&H(4th edition) with graduate material engineer and adequate number of experienced technical staffs to carry out the routine tests is a must to achieve quality work. Q-3 level of quality is proposed for the above work. Roughometer/ Bumpindicator should be used to check riding quality after construction of the road before taking it over. The concrete mix should be prepared in transit mixer or in batching and mixing plant. The mix should be spread with electronic paver with sensor.

13.0 SPECIFICATIONS

The technical specification will be as per The specification for Roads and Bridge works(Fourth Revision) of Ministry of Road Transport and Highways.

14.0 Working Season :- The working season starts from mid october and ends by mid June.

15.0 COST ESTIMATES

The cost estimates have been prepared for the construction of Bypass Road and bridges along with approach road and approach slabs. This comprises Rate analysis, preparation of Bill of quantities and abstract of cost.

The cost estimates have been worked out on the basis of analysis of rates and bill of quantities. Also the following percentages for contingencies have been considered for arriving the total project cost.

Sl. No.	Description	%age over the basic cost
1	Contingency	2.80%
2	Quality control	1.0%
3	Work charge	1.5%
4	Agency charge	9.0%

15.01 Rate Analysis

The basic rates of various items have been taken from the schedule of rates of National Highway Wing, RCD, Jharkhand effective from 26.08.11. The finished rate is inclusive of 4% extra vat and 1.0% labour cess.

15.02 Bill of Quantities

Quantities of various items of work involved have been worked out on the basis of detailed drawings prepared after detailed design.

Sd/-

J.E.

P.I. Division, R.C.D.
Ranchi

Sd/-

A.E.

P.I. Sub-Division, R.C.D.
Hazariabagh

Sd/-

E.E.

P.I. Division, R.C.D.
Ranchi

Handwritten signature
14-06-16

Assistant Engineer
Quality Control
National Highway Division
Gumla