

SUMMARY OF THE PROPOSALS

Name of Work –Widening and Geometric improvement including Paved Shouldering work of existing 2-lane to 4-lane of km .92.935 (start point of old NH-82) TO 99.685 km (End Point of Gaya Bypass of NH-83) of NH-120 (Total Length = 6.750 km).

The National Highway Division, Gaya Bihar has decided to The National Highway Division, Gaya Bihar has decided to Widening from 2-lane to 4-lane of km .92.935 (start point of old NH82) to 99.685 km (End Point of Gaya Bypass of NH-83) OF NH-120 (Total Length = 6.750 km). The implementation of rehabilitation and up-gradation of this part to be taken under the control of Road Construction Department N.H. Division Gaya. This section of National Highway No.-120 originates from Km 92.935 of NH-82 (old) in Gaya at intersection of NH-83 bypass and terminates at Km 99.685 of NH-83 in district Gaya. The total project road is 6.750 Km. The Project Road is connecting the missing link of NH-120 at Gaya.

Considering the present heavy vehicle Traffic Scenario and available Right-of Way, up gradation / improvement of these section in terms of Geometric improvement, strengthening of existing road, construction of paved shoulders, drain cum footpath in Built-up section, improvement/widening/re-construction of existing Cross Drainage Structure in the project section as per guidelines. Construction including Paved Shouldering, Widening and geometric improvement work of existing 2- Lane to 4- lane Stretch from Km. 92.935 to Km. 99.685 of NH-120 has been proposed.

The road passes through important township, Villages /habitations or the Built-up sections Hariya, Gaya Airport, Bilahi Village, Vikapari, Cantaarea, Kharati, Bodh-Gaya, Dhanwa, Maspura Village, Amar Bigha, Vidhya Bihar Colony, Bodha Colony.

The total length of the project road is 6.750 km from Km Ch. 92.935 to Km Ch. 99.685 is passing under the administrative boundary of Gaya Forest Division, Bihar. National Highway Division has to Widening the existing road from 2-lane to 4-lane in the public interest. Improvement of Project Highway as per the applicable IRC codes needs to be widened.

There is no reserve forest near the project road, however, the road has been designated as notified protected forest by Govt. of Bihar attached as Annexure-II. Proposal involves felling of trees from the existing plantation which is notified as protected Forest and approx. 25.65 Ha. Forest land will be affected.

- I. **Total length:** - The total length of the project road is 6.750 km from Km Ch. 92.935 to Km Ch. 99.685 of NH-120 has been proposed.
- II. **Carriageway width:** - 7.0 m with earthen shoulder.
- III. **Proposed Carriage way (including width):** - 4-lane with paved shoulder as per enclosed in TCS Gaya bypass.
- IV. **Existing/ Available Row:** - 40 to 45 m.
- V. **Total 2 Nos. of Hume Pipe Culverts and 11 Nos. of Slab Culverts** is falling in the project section.
- VI. **There are T / Y number** of minor Jn. (15 Nos.) are meeting in this project road at different locations throughout the project section from Ch. 92.950 to Ch 99.640. These

minor junctions comprise of adjoining **connected with NH-120** at different locations.
Improvement and flaring of these Junctions in a length of 45 m.

- VII. Existing Road Crust and Pavement Condition-** The existing Road Crust in Project Section in Project Section is presented in Table in Previous Chapter. The avg. thickness of Base & Sub-Base Layer noted is 590 mm (100mm Drainage Layer, 100 mm GSB, 250 mm WMM, 100mm DBM) and for Bituminous layer is 40 mm B.C.
- VIII. CBR of Subgrade:** - Since the present case is widening of highway in terms of paved shoulder & strengthening of existing pavement. The widening of existing Pavement shall be carried out based on the CBR data obtained after field and lab. The borrow area soil, as revealed from laboratory tests, is mostly sandy having MDD of 17.32 to 20.84 KN / cum at OMC 8.91% - 16.24%. Design CBR value has been taken as the CBR at 90%-ile value (i.e., 10% test results fall below which shall be replaced during construction – $\{d=0.1 \times (n-1)\}$). Depending on 4 days soaked CBR, the road stretch has been divided into 3 homogenous sections. From the CBR values it can be concluded that soil is quite good for subgrade and does not warrant stabilization or improvement.
- IX. Design Traffic:** - Design Traffic for Project Section has been taken as 807 commercial vehicles per day and Average vehicle damage factor of 4.5 has been adopted as per clause 4.4.3 of IRC: 37-2018. The data adopted is projected for the design life of road as per clause 4.6 of IRC: 37. As per IRC: 37-2001, the directional distribution factor and lane distribution factor have been taken to be 0.75 for the two-lane single carriageway road with hard shoulder. The probable cumulative million standard axles have been calculated at all the 4 places where CTVC was conducted from the probable date of completion of the project road and opening to traffic in the year 2016 to 10 years design period i.e. year 2026
- X. Recommended Crust Thickness and overlay for adoption under proposed strengthening work of NH-120 from Ch. 92.935 to Ch. 99.685:** - 100mm (GSB First Layer) above subgrade and 100 mm second layer as Drainage Layer is provided, hence total thickness of GSB will be 200mm, 250 mm WMM DBM is provided 100 mm and 40 mm BC.

Pavement Design: -

- (i) Widening portion:** - The Highway Pavement in project section is flexible throughout from Ch. 92.935 to 99.685 for widening of existing two-lane to 4- lane highway with paved shoulder. Flexible Pavement has been proposed in entire length of project Section.

Design of Flexible Pavement Widening / Paved Shouldering

Design Life: The design life has been adopted as 15 years as recommended by IRC-37, vide clause 4.3.2. Similarly, the design of overlay has been done for 15 years period as per guidelines of IRC 81. After 15 years period, further strengthening layer making up the short falls in pavement thickness along with a profile corrective course after evaluation of structural strength by non-destruction test, will be provided.

Sub Grade: Since the present case is widening of highway in terms of paved shoulder & strengthening of existing pavement. The widening of existing Pavement shall be carried out based on the CBR data obtained after field and lab.

Design Traffic: Design Traffic for Project Section has been taken as 807 commercial vehicles per day and Average vehicle damage factor of 4.5 has been adopted as per clause 4.4.3 of IRC: 37-2018. The data adopted is projected for the design life of road as per clause 4.6 of IRC: 37

Design Thickness of Pavement Layers: Based upon design CBR values obtained from soil tests of existing sub-grade soil and Borrow pits and design traffic in msa, the thickness of component layers of the pavement (paved shoulder) was obtained from the corresponding thickness design chart in IRC: 37 – 2001.

The design of the pavement has been followed to be as at par with the contiguous project of BSRDCL, so that there is a consistency in the maintenance and subsequent strengthening etc.

Design of Flexible Pavement Widening / Paved Shouldering in Project section

Recommended Crust Thickness and overlay for adoption under proposed strengthening work of NH-120 from Ch. 92.935 to Ch. 99.685: - 100mm (GSB First Layer) above subgrade and 100 mm second layer as Drainage Layer is provided, hence total thickness of GSB will be 200mm, 250 mm WMM DBM is provided 100 mm and 40 mm BC.

As per outcome of Design of Flexible Pavement for Paved shoulder as per IRC 37-2018 and Strengthening Overlay design as per IRC 81, the proposed Crust Composition for adoption.

Government of India has decided to upgrade the project stretch for better connectivity to people in order to improve the condition of the road transport network of the state and contribute to its economy development.

The National Highway Division, Gaya Bihar has decided to The National Highway Division, Gaya Bihar has decided to Widening from 2-lane to 4-lane of km .92.935 (start point of old NH82) TO 99.685 km (End Point of Gaya Bypass of NH-83) OF NH-120 (Total Length = 6.750 km). The implementation of rehabilitation and up-gradation. / Improvement of these section in terms of Geometric improvement, strengthening of existing road, construction of paved shoulders, drain cum footpath in Built-up section, improvement/widening/re-construction of existing Cross Drainage Structure of this part to be taken under the control of Road Construction Department N.H. Division Gaya.

The project road section traverse through built-up area but avenue plantation of existing road has been declared as Notified Protected Forest by the Government of Bihar under the Forest (Conservation) Act. 1980. Therefore Forest Clearance to be accorded from Ministry of Environment Forest & Climate change, Government of India for felling of trees under Notified Protected Forest Land.

A total of 25.65 Ha. Notified Forest land will be affected under the jurisdiction of Dist. Gaya Forest Division, Bihar is required for rehabilitation and up-gradation of existing existing 2- Lane to 4- lane Stretch from Km. 92.935 to Km. 99.685 of NH-120, to cater the better traffic facility as per the Indian Road Congress (IRC) guidelines.

The project will not generate directly employment opportunities to people but it can arise opportunity of employment in the future construction work of project road will be awarded to employment in the future. Contractor will hire some skilled and non-skilled persons as per the requirement of construction work.

Total Cost of the project is **119.60 Crores**. Alignment has been designed carefully for the requirement of forest area.


Executive Engineer
N. H. Division, Gaya

Executive Engineer
N.H. Division, Gaya

Date:- 18.07.2021

Place:- Gaya