

REQUEST FOR BID
(RFB)

Barwa Adda Expressway Limited (BAEL)

Six-Laning of Barwa-Adda- Panagarh Section of NH-2 from km 398.240 to km 521.120 including Panagarh Bypass in the States of Jharkhand and West Bengal

Design, Supply, Installation, Testing & Commissioning for LED Lighting works at various locations in Jharkhand section within km 398.240 to km 521.120 on Barwa Adda Panagarh Road Project

| | |
|--|---|
| Document Downloading Date | From September 07, 2023 (11.00 Hrs.) to September 21, 2023 (11.00 Hrs.) |
| Last Date And Time for Receipt of Bids | September 21, 2023 at 18.00 Hrs. (Soft copy) September 22, 2023 at 18.00 Hrs. (Hard copy) |
| Place of Opening of Bids | Barwa Adda Expressway Limited The IL&FS Financial Center, Plot C-22, G Block, Bandra Kurla Complex, Mumbai- 400051 E-mail: itnl.projectbids@itnlindia.com |
| Officer Inviting Bids | Mr. Sachin Joshi/Mr. Ravi Kumar Praveen Barwa Adda Expressway Limited The IL&FS Financial Center, Plot C-22, G Block, Bandra Kurla Complex, Mumbai- 400051 Tel: +91 022-26594804/022-26593693 Mob: +91 8291087709/919909005809 E-mail: itnl.projectbids@itnlindia.com Website: www.itnlindia.com |

**Barwa Adda Expressway Limited
(BAEL)**

BID DOCUMENT

For

**Six-Laning of Barwa-Adda- Panagarh Section of NH-2 from km 398.240 to km 521.120
including Panagarh Bypass in the States of Jharkhand and West Bengal**

**Design, Supply, Installation, Testing & Commissioning for LED Lighting works at
various locations in Jharkhand section within km 398.240 to km 521.120 on Barwa
Adda Panagarh Road Project**

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Barwa Adda Expressway Limited (BAEL)

The IL&FS Financial Center, Plot C-22, G Block, Bandra Kurla Complex, Mumbai- 400051

Tel.: +91 022-26593609,

E-mail: itnl.projectbids@itnlindia.com, Website: www.itnlindia.com

CIN: U45400MH2013PLC242336

INVITATION FOR BID

Date: September 07, 2023

Sub.: Six-Laning of Barwa-Adda- Panagarh Section of NH-2 from km 398.240 to km 521.120 including Panagarh Bypass in the States of Jharkhand and West Bengal

Design, Supply, Installation, Testing & Commissioning for LED Lighting works at various locations in Jharkhand section within km 398.240 to km 521.120 on Barwa Adda Panagarh Road Project

Dear Sir,

- (1) M/s Barwa Adda Expressway Limited (“BAEL”) hereby invites Sealed Bid from Bidders for the work of “**Six-Laning of Barwa-Adda- Panagarh Section of NH-2 from km 398.240 to km 521.120 including Panagarh Bypass in the States of Jharkhand and West Bengal – “Design, Supply, Installation, Testing & Commissioning for LED Lighting works at various locations on Jharkhand section within km 398.240 to km 521.120 on Barwa Adda Panagarh Road Project”**”.
- (2) The period for completion of Lighting works shall be **6 months** period and while you will be required to maintain road for a **Defect Liability Period of 18 Months for civil & electrical works and 5 years for LED lights from date of final completion certificate issued by Employer to Bidder for the entire works including OEM warranty.**
- (3) Deleted
- (4) Bidding documents may be downloaded by the Bidders, free of cost, from the Employer’s web site www.itnlindia.com from ***September 07, 2023, 11.00 Hrs to September 21, 11.00 Hrs.***
- (5) Bid must be accompanied by **Bid Security as per details provided in following table** for Financial Bid given in Annexure 1 of Section 6, in favor of Barwa Adda Expressway Limited, payable at Mumbai.

| Sr. No. | Particular | Bid Security in ₹ |
|----------------|--|--|
| 1 | Design, Supply, Installation, Testing & Commissioning for LED Lighting works | 4,50,000/- (Rupees Four Lac fifty thousand only) |

Bid Security will have to be in the form as specified in the Bidding Document and shall have to be valid for **60 days beyond the validity of the Bid.**

- (6) The technical and financial bids shall be submitted separately through email id **itnl.projectbids@itnlindia.com**; financial bids shall be submitted with password protection, the password shall be sent to the dedicated email id **itnltolls.password@itnlindia.com** on or before 1800 Hrs IST on September 21, 2023 and
- (7) Hard copy delivered to office of Barwa Adda Expressway Limited, Add: The IL&FS Financial Center, Plot C-22, G Block, Bandra Kurla Complex, Mumbai- 400051 **on or before 1800 Hrs IST, September 22, 2023** by hand or by post/Courier.

Signature of Authorized Officer

Barwa Adda Expressway Limited

SECTION 1:

INSTRUCTIONS TO BIDDERS
(ITB)

SECTION 1: INSTRUCTIONS TO BIDDERS

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A: GENERAL

1. Scope of Works

- 1.1 The Barwa Adda Expressway Limited, (hereinafter be referred to as the “Employer”) proposes to execute **Six-Laning of Barwa-Adda- Panagarh Section of NH-2 from km 398.240 to km 521.120 including Panagarh Bypass in the States of Jharkhand and West Bengal – “Design, Supply, Installation, Testing & Commissioning for LED Lighting works at various locations in Jharkhand section within km 398.240 to km 521.120 on Barwa Adda Panagarh Road Project”** hereinafter referred to as the “Works”.
- 1.1.1 The scope of works for Lighting shall be as per the locations, design standards as per concession agreement & relevant codal provisions. Bidder shall design, supply, install, test and commission, any material, LED lights & fixtures as per technical specifications only from the sources specified in the Contract and/or as may be approved by BAEL/Employer.
- 1.1.2 The Contract will be design based, wherein the design of the street lighting considering minimum requirement of 40 lux for minimum period of 5 years will be the responsibility of the Bidder.
- 1.1.3 The Design, Supply, Installation, Testing & Commissioning for Lighting works is to be carried out by the successful Bidder, inter alia, includes the following but not limited to:
- (i) Main street Light feeder panel: Design, Supply, Installation, testing & commissioning of Main Street Light Feeder Pillar (Location: Below grade separator bridge deck area): Over, Low Voltage &
 - (ii) High mast Feeder Panel: Design, Supply, Installation, testing & Commissioning of High mast Feeder Pillar (Location: Below grade separator bridge deck area)
 - (iii) Truck LAY BYE: Design, Supply, Installation, Testing & commissioning of Truck Lay bye Feeder Pillar (Location: Below grade separator bridge deck area)
 - (iv) LT cable & termination
 - (v) Earthing works:
 - (vi) Pole erection: (Location of poles on Main carriageway on flyover at grade separator + service road - both covered by single pole with separate single/double arm bracket)
 - (vii) High Mast Lighting:
 - (viii) LED Street lighting:
 - (ix) LED light fixtures for Flyover under deck lighting

1.1.4 Apart from scope of works (Design, Supply, Installation, Testing & commissioning works for Street Lighting), the Bidder is required to provide LT Connections at various chainages for energizing street lighting (as per chainage list) incl. of Demand notice, supervision charges, security deposit etc. (including Liaoning).

1.1.5 **Defect Liability:**

Subsequent to completion of the scope of works, Bidder shall be responsible for any defect arising in the executed work for a period of **18 Months from the date of completion of the project for Civil & Electrical works and also have OEM warranty of 5 Years for LED lights.**

The successful Bidder shall have full regard and be responsible for the safety of the Works/road users and all Project Site operations and for all methods of design for temporary structures, construction and maintenance of the Works, the Project Road and the Facility, irrespective of any approval or consent by the Employer and cost for the same is deemed to be included in the Bid Price, as incidental to work.

The successful Bidder shall take full responsibility for operation and maintenance of the existing road & facilities thereto and for Traffic Management, in accordance with Annexure-5B of Supplementary Technical Specifications of Section 5 from the Start Date. The cost of maintenance of the road, Barricading, traffic management, markings and signs, look-out persons, construction of temporary cross-drainage and road diversion works, and other similar works needed during implementation of the Works are deemed to be included by the Bidder in the Bid Price, as incidental to work.

The successful Bidder shall carry out his activities in connection with the Contract in such a manner so as to comply with the Environmental Management Plan in accordance with Annexure-5A of Supplementary Technical Specifications, Section 5 of Specifications and shall assume full responsibility for measures which are required to ensure such compliance and cost for the same is deemed to be included in the Bid Price, as incidental to work.

1.2 The Employer is now inviting bids for **Six-Laning of Barwa-Adda- Panagarh Section of NH-2 from km 398.240 to km 521.120 including Panagarh Bypass in the States of Jharkhand and West Bengal – “Design, Supply, Installation, Testing & Commissioning for LED Lighting works at various locations on Jharkhand section within km 398.240 to km 521.120 on Barwa**

Adda Panagarh Road Project” as defined in the Contract Data and referred to as **“Works”**.

- 1.3 The successful Bidder will be expected to complete the works by the Date as specified in the Contract Data and thereafter responsible for the defects for a period of **18 Months from the date of completion of the project for civil & Electrical works and also have OEM warranty of 5 Years for LED lights.**

2 Deleted.

3 **Eligible Bidders**

- 3.1 All the Bidders who will produce the certificate that they have successfully executed value of works from eligible projects not less than 10 Cr. during last 3 Financial Years are eligible to bid.

An eligible project:

- Should have similar scope of work for 4/6 lane National Highway/State Highway as envisaged for the proposed Project (similarity shall be considered for projects having all the components of works as envisaged for the proposed Project)
- Should have been satisfactorily completed (not less than 90% of contract value) during last 3 financial years.
- Should have executed value of works not less than Rs. 3 Cr.

Bidder has to provide details of eligible projects executed during last 3 years as per form 2A which shall be supported by requisite supporting documents i.e. Work Completion Certificate, Certified value of work done / Payment Received, Agreement / Work Order, etc.

- 3.2 All the bidders who produce the turnover certificate of the Auditor that they have total Annual turnover of Rs 10 Cr. during ***last 3 years are eligible to bid.*** This data **should be supported by Auditor Certificate & Balance Sheet** of the company.
- 3.3 Bidders should not have abandoned any of their contracts and should not be under a declaration of ineligibility or blacklisted for corrupt, fraudulent, and coercive practices or poor quality or delayed implementation of any work by the Government of India (GoI), State Governments, Employer, Developer and/or statutory authorities like National Highways Authority of India.

4 **Qualification of the Bidder**

- 4.1 Bidders should submit, with their Bids, qualification information regarding the Lighting works completed by them as defined in clause 3.1 & 3.2 and other

information correct as on 28 days prior to last date of submission of Bids as per Form 2A, Qualification Information and Other Forms of Section 2.

4.2 All Bidders shall also include the following information and documents with their Bids in the formats prescribed, wherever applicable, in this Bidding Document:

- (a) the certificate that they have successfully completed the requisite minimum value of works defined in clause 3.1 and 3.2 during last 3 financial years;
- (b) the certificate that they have requisite total Annual turnover for participation in Bid in **during last 3 financial years.**
- (c) written Power of Attorney authorizing the signatory of the Bid;
- (d) latest Income Tax clearance certificate from the concerned department;
- (e) major items of construction equipment proposed to carry out the Contract; {as per Clause 4.4 (a)}
- (f) an undertaking confirming the validity of above information
- (g) Deleted
- (h) Information regarding any litigation or arbitration resulting from contracts executed by the Bidder in the last three years or currently under execution. The information shall include the names of the parties concerned, the disputed amount, duration of dispute, cause of litigation, matter in dispute and other relevant details; the Bidders shall also submit the information regarding debaring / expelling of Bidder or abandonment of work by Bidder (as per S. Nos. 1.4 & 1.5 of Form 2A of Section 2);
- (i) deleted
- (j) the proposed methodology and program for the Works including Environment and Traffic Management Plans (barricading etc.), backed with equipment and resources planning and deployment, duly supported with broad calculations and quality control procedures proposed to be adopted, justifying the execution and completion of the Work as per Contract Specifications within the stipulated period of completion. The Bidder shall also submit his proposed Works Program and Monthly Cash Flow Forecast in forms at Annexures 3A and 3B, respectively.

4.3 **Joint Venture:** - *Joint Venture (JV) is not allowed.*

4.4 Each Bidder shall demonstrate:

- (a) Section wise availability of key construction equipment as minimum required is indicated in the Schedules at Annexures-1A. The equipment can be either owned or leased or rented. However, it is entirely the responsibility of the Bidder to deploy sufficient Plant and Equipment to ensure satisfactory compliance with his obligations under the Contract, during the execution of Works and for Maintenance Works/DLP as may be required at the Site.

All Equipment provided by the Bidder at the site of Works shall be of the quality and capacity as approved by the Employer and shall be deemed to be exclusively intended for the execution of the Works, and all these shall be operated, used and maintained in a manner acceptable to the Employer.

(b) Deleted

4.5 Even though the Bidders meet the criteria set out above, they are subject to be declared non-responsive if they have:

- (a) made misleading or false representations in the forms, statements and attachments submitted in proof of the qualification requirements; and/or
- (b) record of poor performance such as abandoning the works, not properly completing the contract, inordinate delays in completion, litigation history, or financial failures etc.; and/or
- (c) have been black listed by any statutory agency/employer during the intervening period between qualification and award of works; and/or
- (d) Participated in bidding for any work and has quoted unreasonably high bid prices and could not furnish rational justification to the Employer.

5 One Bid per Bidder

Each Bidder shall submit only one Bid for the work

6 Cost of Bidding

The Bidder shall bear all costs associated with the preparation and submission of his Bid, and the Employer will in no case be responsible and liable for those costs.

7 Site visit

The Bidder, at the Bidder's own responsibility and risk is encouraged to visit and examine the site and its surroundings and obtain all information that may be necessary for preparing the Bid and entering into a contract for the Works. The costs of visiting the site shall be at the Bidder's own expense and no claim shall be eligible in this regard.

B: BIDDING DOCUMENTS

8 Content of Bidding Document

8.1 The set of Bidding Documents consist of documents listed in the Table below and amendment/addenda issued in accordance with Clause 10 of this Section. A copy of Section 6 (Financial Bid) will be available along with the Bidding Documents to the Bidders to facilitate the Bidder to submit the copy of the duly filled Financial Bid.

| Invitation for Bid | | |
|---------------------------|--|----------|
| Section 1 | Instructions to Bidders | Volume 1 |
| Section 2 | Qualification Information and Other Forms | |
| Section 3 | Part-I : General Conditions of Contract Part-II : Special Conditions of Contract | |
| Section 4 | Contract Data | |
| Section 5 | Specifications Annexure A : List of chainages for Lighting works Annexure B : Typical cross sectional design along with schedule | |
| Section 6 | Financial Bid & Technical Specifications | Volume 2 |
| Section 7 | Securities and Other Forms | |

8.2 One copy of each of Volumes 1 and 2 can be downloaded from the site. Documents to be furnished by the Bidder should be in the formats prescribed in Sections 2, 6 and 7 of the Bid Document and addendum issued pursuant to Clause 10.

9 Clarification on Bidding Documents

9.1 A Bidder requiring any clarification of the Bidding Documents may notify the Employer in writing through post, fax or e-mail at the Employer's address indicated in the Invitation to Bid. The Employer will respond to any request for clarification which he has received at least 3 days before the last date for receipt of Bids. Copies of the Employer's response will be uploaded on the web site at **www.itnlindia.com**.

9.2 Any modification of the Bidding Documents listed in Clause 8.1 which may become necessary as a result of the clarification given to Bidders shall be made by the Employer exclusively through the issue of an Addendum pursuant to Clause 10.

10 Amendment of Bidding Documents

- 10.1 Before the deadline for submission of bids, the Employer may modify the Bidding Documents by issuing addenda.
- 10.2 Any addendum thus issued shall be part of the Bidding Documents and shall be communicated at the employer's web site. All such addenda shall become an integral part of the Bidding Document and it shall be incorporated in Bid prices and duly signed, stamped and submitted along with the Bid documents. Bid shall be deemed to be incomplete if the addendum (addenda) is (are) not enclosed duly signed by the Bidder along with the Bid documents.

C: PREPARATION of BIDS

11 Language of the Bid

11.1 All documents relating to the Bid shall be in the English language.

12 Documents Comprising the Bid

12.1 The Bid submitted by the Bidder shall comprise the following:

- Outer envelope marked as per Sub Clause 19.2 in two sets as “ORIGINAL” and “COPY”.

In outer envelopes (ORIGINAL and COPY) the following two inner envelopes marked (I) and (II) along with the other information/materials and bearing identification and address as per Sub Clause 19.2.

Envelope (I) – marked as Bid security and qualification information

- a. Bid Security in prescribed Form 7B of Section 7.
- b. Qualification Information Form/certificates, undertaking etc. (in prescribed Forms 2A, 2B and 2C of Section 2).

Envelope (II) – marked as Form of Bid and Financial Bid

- c. The Form of Bid (in prescribed Form 7A of Section 7). The Form of Bid needs to be submitted with & bid amount in paragraph 1. (Preferably on letterhead of the Bidder).
- d. Financial Bid needs to be on letterhead of the Bidder. Financial Bid for Lighting works is specified in Section 6 (Annexure-1). The same needs to be submitted inclusive of GST and in line with clause 13.

And any other material required to be submitted by Bidders in accordance with these Instructions to Bidders. The documents listed under Sections 2, 6 and 7 of Sub Clause 8.1 shall be Filled in without exception.

12.2 The Bidder shall submit the Bids in two separate envelopes. One envelope marked (I) shall have submissions as per Sub Clause 12.1 (a) and (b). The second envelope marked (II) shall contain submissions as per Sub Clause 12.1 (c) and (d). The Bidder shall prepare two copies of each of these submissions, marking them “ORIGINAL” and “COPY” respectively, which shall be seaLED and put in a covered envelope accordance with the Sealing and Marking instructions in Clause 19.

12.3 Following documents, which are not submitted with the bid, will be deemed to be part of the bid:

| | |
|-----------|--|
| | <u>Invitation for Bids</u> |
| Section 1 | Instructions to Bidders |
| Section 3 | General Conditions of Contract and Special Conditions of Contract |
| Section 4 | Contract Data |
| Section 5 | Specifications |

13 Bid Prices

- 13.1 The Contract shall be for the Works as described in Contract Data, based on the lump sum price as per Financial Bid for the Works submitted by the Bidder in prescribed Bid Form 7A of Section 7 and Annexure-1 of Section 6.
- 13.2 The Bidder shall prepare & submit the design as per the chainages list & Technical specifications submitted by client. Based on the design, the bidder shall fill lump sum price described in the **Financial Bid** for Lighting works which forms the scope of works – Part A & Part B. Items for which no rate or price is entered by the Bidder will not be paid by the Employer when executed and shall be deemed to be covered by the other rates and prices in the Financial Bid. Corrections, if any, shall be made by crossing out, rewriting and initialing, in ink.
- 13.3 All duties, taxes, and other levies payable by the Bidder under the Contract, or for any other cause shall be included in the rates, prices and total Bid Price submitted by the Bidder.
- 13.4 Deleted

14 Currencies of Bid and Payment

- 14.1 The unit rates and the prices shall be quoted by the Bidder entirely in Indian Rupees, and payment shall be made in Indian Rupees.

15 Bid Validity

- 15.1 Bids shall remain valid for a period not less than sixty (60) days after the deadline date for Bid submission, specified in Clause 20. **A bid valid for a shorter period shall be rejected by the Employer as non-responsive.**
- 15.2 In exceptional circumstances, prior to expiry of the original time limit, the Employer may request the Bidders to extend the period of validity for a specified additional period. The request and the Bidders' responses shall be made in writing or by email. A Bidder may refuse the request without forfeiting his Bid security. A Bidder agreeing to the request will not be required or permitted to modify his Bid but will be required to extend the validity of his Bid security for a period of the extension, and in compliance with Clause 16 in all respects.

16 Bid Security

16.1 The Bidder shall furnish, as part of his Bid, a Bid Security for an amount mentioned in Invitation for Bid. **This Bid Security shall be in favor of “Barwa Adda Expressway Limited”** Payable at Mumbai

Account Details:

Bank Name: Bank of Baroda

Name of Account: Barwa Adda Expressway Limited Escrow Account

Account Number: 29100200000238

Branch: CFS Ballard Estate

IFSC Code: BARB0CFSBAL

and may be in one of the following forms:

- A Bank Guarantee, in the prescribed format is acceptable from the following institutions located in India:
 - (a) State Bank of India or its subsidiaries;
 - (b) Any Indian Nationalized /Scheduled Bank;
 - (c) Foreign Bank with operations in India provided the net worth in respect of the Indian operations shall not be less than ₹ 500 Cr. as per the latest Annual Report of the Bank and that Bank Guarantee is issued by a branch in India.
- Bankers' cheque or Demand draft in favor of “Barwa Adda Expressway Limited” payable at Mumbai.

16.2 Bank guarantees issued as surety for the Bid should be valid for 60 days beyond the validity of the Bid.

16.3 Any Bid not accompanied by an acceptable Bid Security and not secured as indicated in Sub Clauses 16.1 and 16.2 shall be rejected by the Employer as non-responsive.

16.4 The Bid Security of unsuccessful Bidders other than the evaluated responsive lowest three Bidders will be returned within 30 days of the completion of the bid evaluation process and within the bid validity period, specified in Sub Clause 15.1. The Bid Security of two of the lowest three Bidders, other than the successful Bidder, shall be returned after signing of the Contract Agreement with the successful Bidder.

16.5 The Bid Security of the successful Bidder will be discharged when the Bidder has signed the Agreement.

- 16.6 The Bid Security may be forfeited
- a. if the Bidder withdraws the Bid after Bid opening during the period of Bid validity;
 - b. if the Bidder does not accept the correction of the Bid Price, pursuant to Clause 27; or
 - c. in the case of a successful Bidder, if the Bidder fails within the specified time limit to sign the Agreement

17 Alternative Proposals by Bidders

17.1 Conditional offers or alternative proposals will not be considered.

18 Format and Signing of Bid

- 18.1 The Bidder shall prepare one original and one copy of the documents comprising the Bid as described in Clause 12, and clearly marked “ORIGINAL” and “COPY” as appropriate. In the event of discrepancy between them, the original shall prevail.
- 18.2 The original and copy of the Bid shall be typed or written in indelible ink and shall be signed by a person or persons duly authorized to sign on behalf of the Bidder, pursuant to Sub Clauses 4.2 and 4.3. All pages of the Bid where entries or amendments have been made shall be initialed by the person or persons signing the Bid.
- 18.3 The Bid shall contain no alterations or additions, except those to comply with instructions issued by the Employer, or as necessary to correct errors made by the Bidder, in which case such corrections shall be initialed by the authorized signatory.
- 18.4 The Bidder shall furnish information as described in the Form of Bid (in Form 7A of Section 7) on commissions or gratuities, if any, paid or to be paid to agents relating to this Bid, and to contract execution if the Bidder is awarded the contract.
- 18.5 Deleted

D: SUBMISSION OF BIDS

19 Sealing and Marking of Bids

- 19.1 The Bidder shall seal the original and copy of the Bid together with the soft copy duly filled in separate envelopes as described in Sub Clause 12.2, duly marking the envelopes as "**ORIGINAL**" and "**COPY**". These envelopes (called as inner envelopes) shall then be put inside **one outer envelope**.

In addition to that soft copy of above bid also to be sent on email id: itnl.projectbids@itnlindia.com, and the bids heavy in size can be submitted via link.

- 19.2 The **outer** and two **inner** (marked (I) and (II)) envelopes shall be
- a) addressed to the Employer at the following address:

Barwa Adda Expressway Limited

The IL&FS Financial Center, Plot C-22, G Block, Bandra Kurla Complex, Mumbai- 400051, Tel.: +91 022-26593609, ,

and

- b) bear the following identification on **Outer Single Envelope**:

“Six-Laning of Barwa-Adda- Panagarh Section of NH-2 from km 398.240 to km 521.120 including Panagarh Bypass in the States of Jharkhand and West Bengal – “Design, Supply, Installation, Testing & Commissioning for LED Lighting works at various locations in Jharkhand section within km 398.240 to km 521.120 on Barwa Adda Panagarh Road Project”

DO NOT OPEN ON OR BEFORE 1800 Hrs on September 21, 2023

- 19.3 In addition to the identification required in Sub Clause 19.2, the inner envelopes shall indicate the name and address of the Bidder to enable the Bid to be returned unopened in case it is declared late, pursuant to Clause 21.
- 19.4 If the outer envelope is not sealed and marked as above, the Employer will assume no responsibility for the misplacement or premature opening of the Bid.

20 Deadline for Submission of the Bids

- 20.1** Completed Bids must be received by the Employer at the address specified above no later than **1800 Hrs IST on September 21, 2023** for Soft Copy &

1800 Hrs IST on **September 22, 2023** for Hard Copy. In the event of the specified date for the submission of Bids being declared a holiday for the Employer, the Bids will be received up to the appointed time on the next working day.

20.2 The Employer may extend the deadline for submission of Bids by issuing an amendment in accordance with Clause 10, in which case all rights and obligations of the Employer and the Bidders previously subject to the original deadline will then be subject to the new deadline.

21 Late Submission of Bids

21.1 Any Bid received by the Employer after the deadline prescribed in Clause 20 will be returned unopened to the Bidder.

22 Modification and Withdrawal of Bids

22.1 Bidders may modify or withdraw their Bids by giving notice in writing before the deadline prescribed in Clause 20.

22.2 Each Bidder's modification or withdrawal notice shall be prepared, sealed, marked, and delivered in accordance with Clauses 18 and 19, with the outer and inner envelopes additionally marked "**MODIFICATION**" or "**WITHDRAWAL**", as appropriate.

22.3 No Bid may be modified after the deadline for submission of Bids.

22.4 Withdrawal or modification of a Bid between the deadline for submission of Bids and the expiration of the original period of Bid validity specified in Clause 15.1 or as extended pursuant to Clause 15.2 may result in the forfeiture of the Bid security pursuant to Clause 16.

22.5 Bidders may offer discount or modify the prices of their Bids only by submitting Bid modifications in accordance with this clause or included in the original Bid submission.

E: BID OPENING and EVALUATION

23 Bid Opening

- 23.1 The Employer will open all Bids received (except those received late), including modifications made pursuant to Clause 22, in the presence of the Bidders or their representatives who choose to attend at the time, date and place specified in Clause 20. In the event of the specified date of Bid opening being declared a holiday for the Employer, the Bids will be opened at the appointed time and place on the next working day.
- 23.2 Envelopes marked “**WITHDRAWAL**” shall be opened and read out first. Bids for which an acceptable notice of withdrawal has been submitted pursuant to Clause 22 shall not be opened. Subsequently all envelopes marked “**MODIFICATION**” shall be opened and the submissions therein read out in appropriate detail.
- 23.3 The Employer will open the outer envelope of all the bids received for the project (except those received late). Subsequently, **Envelope (I)** marked containing **Bid security and qualification information** as per Sub Clause 12.1 (a) and (b) shall be opened for all the Bidders.
- 23.4 On confirming the Bid security, **Envelope (II)** marked containing **the Form of Bid and Financial Bid** as per Sub Clause 12.1 (c) and (d) shall be opened for all the Bidders. The Bidder’s names, the Bid prices, the total amount of the Bid, any discounts, Bid modifications and withdrawals, the presence or absence of Bid security, and such other details as the Employer may consider appropriate, will be announced by the Employer at the opening. Determination of the lowest Bidder shall be done after evaluation of the Bids as per terms of the Bid Document.
- 23.5 No bid shall be rejected at bid opening except for late bids pursuant to Clause 21 and conditional bids. Bids (and modifications) sent pursuant to Clause 22 that are not opened and read out at bid opening will not be considered for further evaluation regardless of the circumstances. Late and withdrawn bids will be returned un-opened to Bidders.

24 BID EVALUATION CRITERIA:

1) EVALUATION PROCEDURE

| Sl. No | Particular | Details | Max. Marks | Score | Remarks |
|--------|--|---------|------------|-------|---------|
| a) | Financial standing as certified by Bankers, Total Annual turnover in last Three years, evidence of access to adequate working capital. | | | | |
| | | | 40 | | |
| | | | | | |
| | | | | | |
| b) | Savings in total power consumption considering design & payback period considering investment for last 3 financial years | | 40 | | |
| c) | Experience in executing street lighting works during last 3 financial years | | 20 | | |
| | Total Marks | | 100 | | |

The assessment will be done on above basis. Hence Bidder must submit authenticated information with supporting documents as above.

2) QCBS EVALUATION CRITERIA

1. Technical: -

| Turn Over | Points |
|----------------|--------|
| Minimum 10 Cr | 25 |
| 10 Cr to 25 Cr | 35 |
| 25 Cr or above | 40 |

| Savings & Payback period | Points |
|---|---|
| Savings in total power consumption considering design & payback period considering investment done for last 3 financial years | Maximum savings in total power consumption – 20 points Minimum savings in total power consumption – 10 points No savings in total power consumption – 0 points Minimum Payback period – 20 points Maximum payback period – 0 points |
| Note: The above score shall be limited to a maximum of 40 Points | |

| Experience in execution of street lighting works in last 3 years | Points |
|---|---|
| Experience for execution of street lighting works | Less than 10 Cr. - 0 points 10 Cr. to 25 Cr - 5 points 25 Cr. To 50 Cr. – 10 points 50 Cr. To 75 Cr. – 15 points 75 Cr. & above - 20 points |

To become eligible for short listing in the technical bid, bidder must secure at least 60 marks in aggregate. Based on the highest score, Technical score will be worked out.

2. Financial: -

The lowest bidder shall be assigned a financial score of 100 points and the other bidders shall be assigned financial score in proportion to the Lowest bidder.

25 FINAL EVALUATION FOR SELECTION: (QCBS Evaluation):

The Final Evaluation for selection will be based on combined evaluation of Technical & Financial score. Weightage for Technical and Financial score will be in the ratio of **50:50**

26 MODE OF EVALUATION:

The Evaluation will be QCBS (Quality- Cost Based Selection) Evaluation.

Final Score: $F = 0.5 \times T_s + 0.5 \times F_s$

T_s = Technical Score

F_s = Financial score

27 Clarification of Bids

- 27.1 To assist in the examination, evaluation, and comparison of Bids, the Employer may, at his discretion, ask any Bidder for clarification of his Bid, including breakdowns of all the unit rates. The request for clarification and the response shall be in writing or by cable, but no change in the price or substance of the Bid shall be sought, offered, or permitted except as required to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the Bids in accordance with Clause 27. In case any Bidder refuses to furnish any clarification sought by the Employer, which may affect his Bid Price, then his bid shall be liable to be treated as non-responsive.
- 27.2 Subject to Sub Clause 25.1, no Bidder shall contact the Employer/its representatives on any matter relating to the Bid from the time of the bid opening to the time the contract is awarded. If the Bidder wishes to bring additional information to the notice of the Employer, he shall do so in writing.
- 27.3 Any effort by the Bidder to influence the Employer in the Employer's bid evaluation, bid comparison or contract award decisions may result in the rejection of the Bidder's Bid.

28 Examination of Bids and Determination of Responsiveness

- 28.1 During the detailed evaluation of Bids, the Employer will determine whether each Bid (a) meets the eligibility criteria defined in Clauses 3 and 4, (b) has been properly signed; (c) is accompanied by the required securities, and (d) is substantially responsive to the requirements of the Bidding documents.
- 28.2 A substantially responsive Bid is one which conforms to all the terms, conditions, and specifications of the Bidding Documents, without material deviation or reservation. A material deviation or reservation is one (a) which affects in any substantial way the scope, quality, or performance of the Works; (b) which limits in any substantial way, inconsistent with the Bidding Documents, the Employer's rights or the Bidder's obligations under the Contract; or (c) whose rectification would affect unfairly the competitive position of other Bidders presenting substantially responsive Bids.
- 28.3 If a Bid is not substantially responsive, it will be rejected by the Employer, and shall not subsequently be made responsive by correction or withdrawal of the non-conforming deviation or reservation.

29 Correction of Errors

- 29.1 Bids determined to be substantially responsive will be checked by the Employer for any arithmetic errors. Errors will be corrected by the Employer as follows:

- a. where there is a discrepancy between the rates in figures and in words, the rate in words will govern; and
 - b. where there is a discrepancy between the unit rate and the line-item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted will govern.
 - c. in case different rates are furnished in different sections of the Financial Bid for the same item, then the lowest rate for the item shall prevail for all the places where the item is appearing.
- 29.2 The amount stated in the Bid will be corrected by the Employer in accordance with the above procedure for the Correction of Errors and, with the concurrence of the Bidder. Such adjusted Bid Price shall be considered as binding upon the Bidder. If the Bidder does not accept the corrected amount, the Bid will be rejected and the Bid Security may be forfeited in accordance with Sub Clause 16.6 (b).

30 Evaluation and Comparison of Bids

- 30.1 The Employer will evaluate and compare only the Bids determined to be substantially responsive in accordance with Clause 26.
- 30.2 In evaluating the Bids, the Employer will determine for each Bid the evaluated Bid Price by adjusting the Bid Price as follows:
- a. making any correction for errors pursuant to Clause 27; or
 - b. making an appropriate adjustment for any other acceptable variations, deviations; and
 - c. making appropriate adjustments to reflect discounts or other price modifications offered in accordance with Sub Clause 22.5.
- 30.3 The Employer reserves the right to accept or reject any variation, deviation, or alternative offer. Variations, deviations, and alternative offers and other factors which are in excess of the requirements of the Bidding documents or otherwise result in unsolicited benefits for the Employer shall not be taken into account in Bid evaluation.
- 30.4 Deleted
- 30.5 If the Bid of the successful Bidder is unbalanced in relation to the Employer's estimate of the cost of work to be performed under the Contract, the Employer may require the Bidder to produce detailed rate analysis for any or all items of the Financial Bid, to demonstrate the internal consistency of those rates with the construction methods and schedule proposed.

F: AWARD OF CONTRACT

31 Award Criteria

31.1 Subject to Clause 30, the Employer will award the Contract to the Bidder whose Bid has been determined to be substantially responsive to the Bidding documents and who has offered the Lowest Evaluated Bid Price, provided that such Bidder has been determined to be (a) eligible in accordance with the provisions of Clause 3, and (b) qualified in accordance with the provisions of Clause 4.

32 Employer's Right to accept any Bid and to reject any or all Bids

32.1 Notwithstanding Clause 29, the Employer reserves the right to accept or reject any Bid, and to cancel the Bidding process and reject all Bids, at any time prior to the award of Contract, without thereby incurring any liability to the affected Bidder or Bidders or any obligation to inform the affected Bidder or Bidders of the grounds for the Employer's action.

33 Notification of Award and Signing of Agreement

33.1 The Bidder who's Bid has been accepted will be notified of the award after approval of NHAI/Lenders by the Employer prior to expiration of the Bid validity period by cable, telex or facsimile, and confirmed by registered letter. This letter (hereinafter and in the Conditions of Contract called the "Letter of Acceptance") (Form 7C of Section 7) will state the sum that the Employer will pay the Bidder in consideration of the execution, completion, and maintenance of the Works by the Bidder as prescribed by the Contract (hereinafter and in the Contract called the "Contract Price").

33.2 The notification of award through the Letter of Acceptance will signify the intention of the Employer to enter into a contract, subject to the furnishing of a Performance Security by the Bidder in accordance with the provisions of Clause 32.

33.3 The Agreement (Form 7F of Section 7) will incorporate all clarifications sought and submitted, and all agreements between the Employer and the successful Bidder. It will be signed by the Employer and kept ready in his office for signatures of the successful Bidder within 14 days following the issue of the Letter of Acceptance.

33.4 Upon Signing of Contract by the successful Bidder, the Employer will promptly notify the other Bidders that their Bids have been unsuccessful and refund their bid security.

34 Performance Security and Tender conditions

34.1 Within 7 days of receipt of the Letter of Acceptance, the successful Bidder shall deliver to the Employer a Performance Security in the form of an unconditional Bank Guarantee for an amount equivalent to 5% of the Contract Price (Excluding GST) for works, in accordance with Clause 28.5 of ITB and Clause 48 of General Conditions of Contract of Section 3. The Bank Guarantee, in the prescribed format (Form 7B of Section 7), is acceptable from the following institutions located in India:

- a. State Bank of India or its subsidiaries;
- b. Any Indian Nationalized /Scheduled Bank;
- c. IDBI Bank or Axis Bank or ICICI Bank or HDFC Bank or Yes Bank; or
- d. Foreign Bank with operations in India provided the net worth in respect of the Indian operations shall not be less than ₹ 500 crores as per the latest Annual Report of the Bank and that Bank Guarantee

34.2 Deleted

34.3 Failure of the successful Bidder to comply with the requirements shall constitute sufficient grounds for cancellation, cause for annulment of the award, forfeiture of the Bid Security, Performance Bank Guarantee and any such other remedy the Employer may take under the Contract, and the Employer may resort to awarding the Contract to any other evaluated Bidder.

35 Advance Payment

35.1 The Employer will provide an interest free Advance Payment on the Contract Price to the Bidder, as per Clause 47 of General Conditions of Contract (Section 3) subject to a maximum amount as stated in Contract Data.

36 Corrupt or Fraudulent Practices

36.1 The Employer requires that the Bidders/Bidders, observe the highest standard of ethics during the procurement and execution of the Contracts. In pursuance of this policy, the Employer:

- a) defines, for the purposes of this provision, the terms set forth below:
 - i. “Corrupt practice” means the offering, giving, receiving or soliciting of anything of value to influence the action of Employer/its representatives in the procurement process or in contract execution;
 - ii. “Fraudulent practice” means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Employer, and includes collusive practice among Bidders (prior to or after bid submission) designed to establish Bid Prices at artificial non-competitive levels and to deprive the Employer of the benefits of free and open competition;

- iii. “Coercive practice” means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the procurement process or affect the execution of the Contract.

- b) will reject a proposal for award if the Employer determines that the Bidder recommended for award has engaged in corrupt, fraudulent or coercive practices in competing for the contract in question;

- c) will declare a firm ineligible, either indefinitely or for a stated period of time, if the Employer at any time determines that the firm has engaged in corrupt, fraudulent or coercive practices in competing for, or in executing, contracts.

Annexure – 1A

(Please refer Sub Clause 4.4 (a) of ITB)

**Schedule of Minimum Key Construction Plant and Equipment required to be mobilized
by Bidder for the works**

| Sr. No. | Type of Equipment | Plant & Equipment Nos. |
|----------------|--|-----------------------------------|
| 1 | Hydra (Crane) of 15 Ton capacity or truck mounted bucket lift | 1 |
| 2 | JCB | 1 |
| 3 | Auger | 1 |
| 4 | Tractor | 1 |
| 5 | Drilling machine | 1 |

Note:

The Bidder must mobilize scope wise minimum resources as tabulated above. i.e. Resources to be deployed for respective sections shall be separate from each other, in case work to be started and implemented in various sections at the same time.

Apart from above, minimum equipment, the Bidder shall also mobilize additional equipment / plant / machinery for execution of above works.

The bidder must produce the documentary evidence in support of his owning/leased/ rented of the above equipment. In case the bidder proposes to hire or take the above equipment on lease, he should, along with the lease/rent agreement, attach the proof of ownership of these equipment with the company/ entity from whom the equipment are proposed to be hired on lease/ rent.

SECTION 2:

**QUALIFICATION INFORMATION
AND OTHER FORMS**

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| Form 2B | Undertaking confirming evidence of access or availability of credit facilities | 35 |
| Form 2C | Letter from bidder to bankers authorizing them to provide information to Barwa Adda Expressway Limited /Its Representatives | 36 |

QUALIFICATION INFORMATION

The information to be filled in by the Bidder in the following pages will be used for purposes of the Qualification Information as mentioned in Clause 4 of the Instructions to Bidders. (Separate pages with required details shall be attached)

1. Details of Bidder

Name of Bidder/ Address/ Telephone/ Fax/ Email/ Contact Person and Designation

1.1. Constitution or legal status of Bidder

[Attach copy]

Place of registration: _____

Principal place of business: _____

Power of attorney in favor of signatory of Bid (Attach copy)

1.2. Availability of Bidder's Equipment should be listed below for carrying out the Works. Bidder is to fill the following items regarding the availability of Equipment. The minimum requirement is available at Clause 4.4 (a) of ITB.

| Item of equipment | Minimum Requirement | | Availability proposals | | | | Remarks / Make |
|-------------------|---------------------|----------|------------------------|----------|-----------|-------------------------------|----------------|
| | No | Capacity | Nos | Capacity | Condition | Owned/ Leased/ to be procured | |
| | | | | | | | |
| | | | | | | | |

1.3. Information on litigation history in which the Bidder is involved

{Refer ITB Clause 4.2 (i)}-

| Item Head | Litigation 1 | Litigation 2 |
|--|--------------|--------------|
| Name of Employer | | |
| Month/Year of origin | | |
| Cause of Litigation/ Matter in Dispute | | |
| Disputed Amount (Current Value in Indian Rupees) | | |
| Resolved or pending resolution | | |
| Award <i>For</i> or <i>Against</i> | | |

| | | |
|--|--|--|
| Actual Amount Awarded (Current Value in Indian Rupees) | | |
| Other Claims Made, SettLED/ Rejected | | |

1.4. Information regarding current litigation, debarring / expelling of bidder or abandonment of work by bidder; {(Refer ITB Clause 4.2 (i)}

| | | | |
|---|-----|--|--------|
| 1 | (a) | Has the Bidder or its constituent partners a history of litigation/arbitration | Yes/No |
| | (b) | If yes, give details | |
| 2 | (a) | Has the Bidder or any of its constituent partners been debarred/expelled by any Agency in India, during the last 3 years as on the date of application | Yes/No |
| | (b) | If yes, give details | |
| 3 | (a) | Has the Bidder or any of its constituent partners abandoned any contract work in India during the last 3 years | Yes/No |
| | (b) | If yes, give details | |
| 4 | (a) | Has the Bidder or any of its constituent partners been declared bankrupt during the last 3 years | Yes/No |
| | (b) | If yes, give details, including present status | |

Note: If any information in this schedule is found to be incorrect or concealed, at any time including after the award of works, the Bidder's bid will be treated as non-responsive, and action taken accordingly.

1.1. (A) Work performed as prime Bidder/sub-Bidder, work performed in the past as a nominated/approved sub- Bidder provided further that all other qualification criteria are satisfied (in the same name) of a similar nature during the last 3 years.

| Project Name | Name of the Empl oyer* | Descrip tion & Scope of work | Contr act No. | Value of Contract (₹ Crore) | Value of works complete d | Role of Bidder/% of participatio n | Date of issue of work order | Stipulated period of comple tion | Actual date of comp letion * |
|--------------|------------------------|------------------------------|---------------|-----------------------------|---------------------------|------------------------------------|-----------------------------|----------------------------------|------------------------------|
| | | | | | | | | | |

Information on works in progress and works likely to be awarded.

(B) Current Commitments and Works in Progress

| S N | Description of Work | Place & State | Name of the Employer | Contract No. and Date | Value of Contract (₹ Cr.) | Stipulated Period of Completion Date | Value of works completed (₹ Cr.) @ | Value of Works Remaining to be completed (₹ Cr.) | Anticipated Completion Date | Role of Bidder* and Remarks |
|--------|---------------------|---------------|----------------------|-----------------------|---------------------------|--------------------------------------|------------------------------------|--|-----------------------------|-----------------------------|
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | TOTAL | | | | | | | | | |

(C) Contracts for which Bids already submitted and are likely to be awarded

| Sl No | Description of Work | Place & State | Name of the Employer | Estimated Value of Contract ₹ Crores) | Stipulated Period of Completion | Date when Decision is expected | Role of Bidder* and Remarks |
|-------|---------------------|---------------|----------------------|---------------------------------------|---------------------------------|--------------------------------|-----------------------------|
| | | | | | | | |
| | | | | | | | |
| | TOTAL | | | | | | |

Note:

@ : In case of currencies other than Indian Rupees, please indicate the value of works in the original currency as well as Indian Rupees and also the exchange rate assumed.

*: Specify whether works were executed as Main Bidder, and Sub-Bidder or as JV Partner, along with their share.

1.6.1. Suitable certification from Employers to be necessarily attached as part of this Appendix.

2. Deleted

**SAMPLE FORMAT FOR EVIDENCE OF ACCESS TO OR AVAILABILITY OF
CREDIT FACILITIES**

Deleted

**SAMPLE FORMAT FROM BIDDER TO BANKERS AUTHORIZING THEM TO
PROVIDE INFORMATION TO BARWA ADDA EXPRESSWAY LIMITED / ITS
REPRESENTATIVES**

To
Name of Bank/Address/City

Dear Sirs:

We have recently submitted a Bid to Barwa Adda Expressway Limited for implementing the Works **“Six-Laning of Barwa-Adda- Panagarh Section of NH-2 from km 398.240 to km 521.120 including Panagarh Bypass in the States of Jharkhand and West Bengal – Design, Supply, Installation, Testing & Commissioning for LED Lighting works at various locations on Jharkhand section within km 398.240 to km 521.120 on Barwa Adda Panagarh Road Project.** We hereby authorize you to provide all information/data readily about us and our credit status, as may be required by Barwa Adda Expressway Limited and you need not seek any clearance/opinion from us for providing the information/data to Barwa Adda Expressway Limited and/or its authorized representatives.

Sincerely,

Authorized Signatory

SECTION 3:

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SECTION: 3

PART – I: GENERAL CONDITIONS OF CONTRACT

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PART – I GENERAL CONDITIONS OF CONTRACT (GCC)

A: GENERAL

The Bidder acknowledges the fact that the Concession Agreement between NHAI & the Concessionaire is always binding and terms of this Agreement are on back to back basis with the Concession Agreement (limited to the Scope defined in this Agreement) and in case of any discrepancy in whatsoever matter, the clauses of Concession Agreement shall prevail over & above this Agreement and the decision of NHAI/Independent Engineer (IE) shall be binding to all the parties to this Agreement.

1. Definitions

- 1.1. Terms which are defined in the Contract Data are not defined in the Conditions of Contract but keep their defined meanings. Capital initials are used to identify defined terms.

Financial Bid means the completed **Financial Bid** forming part of the Bid.

Compensation Events are those defined in Clause 41.

Contract Completion Date is the date of completion of Bidder's obligations under this Contract for the lighting works as indicated in the Contract Data.

Contract is the contract between the Employer and the Bidder to execute, complete and maintain the Works. It consists of the documents listed in Sub Clause 2.2.

Contract Data defines the documents and other information which comprise the Contract, more specifically refers to Section 4 of the Document.

Bidder is a person or firm, whose Bid to carry out the Works has been accepted by the Employer.

Bidder's Bid is the completed Bidding document submitted by the Bidder to the Employer.

Contract Price is the price stated in the Letter of Acceptance for Lighting works.

Days are calendar days; **months** are calendar months.

Defect is any part of the Works not completed in accordance with the Contract.

Defects Liability Period is the period specified in the Contract Data and calculated from the works Completion Date. For this particular contract, Defects Liability Period is 18 months for civil & electrical works after the works Completion Date and 5 years warranty period for LED lights & fixtures from date of final completion certificate issued by Employer to Bidder for the entire works respect including the OEM warranty.

Design/Drawings include calculations and other information provided.

Employer is the party who will employ the Bidder to carry out the Works or its authorized representative.

Authorized representative is the person (or any other competent person appointed and notified to the Bidder to act in replacement of the Employer) who is responsible for supervising the execution of the Works and administering the Contract.

Equipment is the Bidder's machinery and vehicles' brought, temporarily or otherwise, to the Site to construct the Works.

Intervention Standards is the level of the damage at which road assets need to be intervened and repaired.

Letter of Acceptance means the formal acceptance by the Employer of the Bid.

Materials are all supplies, including consumables, used by the Bidder for incorporation in the Works.

Milestone is a specified date or duration by which specified works are to be completed.

Permanent Works means the permanent works to be executed in accordance with the Contract.

Plant is any integral part of the Works which is to have a mechanical, electrical, electronic or chemical or biological function.

Rectification Standards is the period of time given to repair the damage to the road asset.

Completion Date is the actual date of completion of Lighting works as certified by the Employer in accordance with Sub Clause 50.1.

Road Asset Group is clubbing of similar activities for road maintenance.

Service Quality specifies the condition of the road asset which gives a desirable level of service and comfort.

Site is the area defined as such in the Contract Data.

Specification means the Specifications of the Works included in the Contract and any modification or addition made or approved by the Employer, in writing.

Start Date is given in the Contract Data. It is the date when the Bidder shall commence execution of the Works. It does not necessarily coincide with any of the Site Possession Dates.

Sub Bidder is a person or firm or corporate body who has a contract with the Bidder to carry out a part of the work in the Contract.

Temporary Works are works designed, constructed, installed, and removed by the Bidder which are needed for construction or installation or maintenance of the Works.

Variation is an instruction given by the Employer in writing which varies the Works.

Works means the Lighting works as stated in the Contract Data.

Working Drawings means all Drawings, calculations, samples, patterns, models, maintenance manuals and other technical information of a like nature submitted by the Bidder and approved by the Employer, for execution of the Works.

2. Interpretation

2.1. In interpreting these Conditions of Contract, singular also means plural, male also means female or neuter, and the other way around. Headings have no significance. Words have their normal meaning under the language of the Contract unless specifically defined. The Employer will provide instructions clarifying queries about the Contract.

2.2. The documents forming the Contract shall be interpreted in the following order of priority:

- a) Agreement (if completed)
- b) Letter of Acceptance
- c) Bidder's Bid
- d) Contract Data
- e) Conditions of Contract
- f) Specifications

- g) Financial Bid; and
- h) Any other document forming part of the Contract.

3. **Language and Law**

- 3.1. The language of the Contract and the law governing the Contract are stated in the Contract Data.

4. **Engineer's Duties and Employer**

- 4.1. Deleted
- 4.2. Deleted.
- 4.3. Deleted

5. **Delegation**

- 5.1. Deleted.

6. **Communication**

- 6.1. Communication between parties of the Contract shall be effective only when it is in writing. A notice shall be effective only when it is delivered (in terms of Indian Contract Act).

7. **Subcontracting**

- Whole or any part of Subcontracting of the work is not allowed

8. **Other Bidders**

- 8.1. The Bidder shall cooperate and share the Site with other Bidders, public authorities and the Employer and his representatives. The Bidder shall provide facilities and services for them related to the Work. The Employer may modify the Schedule of Other Bidders and shall notify the Bidder of any such modification.

9. **Personnel**

- 9.1. The Bidder shall employ the key personnel for the Construction works, named in the Details of Key Personnel as referred to in the Contract Data to carry out the functions of the positions stated in Annexures–1C and 1D of the Instructions to Bidders, Section 1 or other personnel approved by the Employer. The Employer will approve any proposed replacement of key personnel only if their qualifications, abilities, and experience are relevant to the nature of duties.
- 9.2. If the Employer asks the Bidder to remove a person who is a member of the Bidder's staff or his work force stating the reasons, the Bidder shall ensure that the person leaves the Site within seven days and has no further connection with the work in the Contract.

10. Employer's and Bidder's Risks

10.1. The Employer carries the risks which this Contract states are Employer's risks, and the Bidder carries the risks which this Contract states are Bidder's risks.

11. Employer's Risks

11.1. The Employer is responsible for the excepted risks which are in so far as they directly affect the execution of the Works in the Employer's country, the risks of war, hostilities, invasion, act of foreign enemies, rebellion, revolution, insurrection or military or usurped power, civil war, riot, commotion or disorder (unless restricted to the Bidder's employees), and contamination from any nuclear fuel or nuclear waste or radioactive toxic explosive.

12. Bidder's Risks

12.1. All risks of loss of or damage to physical property and of personal injury and death which arise during and in consequence of the performance of the Contract other than the excepted risks as at Sub Clause 11.1 are the responsibility of the Bidder.

13. Insurance

13.1. The Bidder shall provide, in the joint names of the Employer and the Bidder, insurance cover from any of the acceptable Insurance Companies in India, valid from the Start Date to the end of the Defects Liability cum Maintenance Period, including extended period, in the amounts and deductibles stated in the Contract Data.

13.2. Policies and certificates for insurance, from the acceptable Insurance Companies in India, shall be delivered by the Bidder to the Employer for the Employer's approval before the Start Date. All such insurance shall provide for compensation to be payable in Indian Rupees, along with the types and proportions required to rectify the loss or damage incurred.

13.3. If the Bidder does not provide any of the policies and certificates required, the Employer may affect the insurance which the Bidder should have provided and recover the premiums the Employer has paid, from payments otherwise due to the Bidder or, if no payment is due, the payment of the premiums shall be a debt due and if warranted, recovered from outstanding payments or from retention money.

13.4. Alterations to the terms of insurance shall not be made without the prior approval of the Employer, in writing.

13.5. The parties shall ensure that insurance is as per the applicable laws, and comply with all conditions of the insurance policies.

13.6. It shall be the responsibility of the Bidder to notify the insurance company of any change in the nature and extent of the Works and to ensure the adequacy of the insurance cover at all times during the period of the Contract or the extended period, if any.

14. Bidder to Construct the Works and Works to be completed by Contract Completion Date

14.1. The Bidder shall undertake the Works in accordance with the Contract as per instructions of the Employer.

14.2. The Bidder shall commence the Works on the Start Date and shall carry out the Works in accordance with the Program submitted by the Bidder, as updated with the consent of the Employer, and complete them by the Contract Completion Date stated in the Contract Data.

14.3. Deleted.

14.4. The works mentioned in FINANCIAL BID, Section 6, Volume 2 shall be undertaken with the approval of the Employer.

15. Safety, Security and Protection of the Environment

15.1. The Bidder shall, throughout the execution and completion of the Works, the remedying of any defects therein and during Defect Liability period:

- (a) have full regard for the safety of all persons entitled to be upon the Site and keep the Site so far as the same is under his control and the Works so far as the same are not completed or occupied by the Employer in an orderly state appropriate to the avoidance of danger to such persons;
- (b) provide and maintain at his own cost all lights, guards, fencing, warning signs and watching, when and where necessary or required by the Employer or by any duly constituted Employer, for the protection of the public or others; and
- (c) take all reasonable steps to protect the environment, on and off the Site, and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as a consequence of his methods of operation.

The Bidder and his Sub Bidders shall abide at all times by all existing enactments on environmental protection and rules made there under, regulations, notifications and bye-laws of the State or Central Government, or local authorities and any other law, bye-law, regulations that may be passed or notification that may be

issued in this respect in future by the State or Central Government or the local Employer. Some of the major laws that are applicable are given below:

- The Water (Prevention and Control of Pollution) Act, 1974.
- The Air (Prevention and Control of Pollution) Act, 1981.
- The Environment (Protection) Act, 1986.
- The Public Liability Insurance Act, 1991.

16. Working Drawings

16.1. Deleted

16.2. The Bidder shall submit Designs, Specifications and Drawings to the Employer who will approve these, if they comply with the specifications & Drawings.

17. Approval by the Employer

17.1. The Employer shall approve the Designs, Specifications and Drawings submitted by the Bidder.

17.2. The Bidder shall obtain approval of other relevant authorities/agencies (if any like the Railways Department etc.) to carry out Works, where required.

17.3. The Employer's approval shall not relieve the Bidder of his obligations.

18. Safety of Traffic

18.1. The Bidder shall be responsible for the safety of all activities on the Site.

19. Discoveries

19.1. Anything of historical or other interest or of significant value unexpectedly discovered on the Site shall be property of the Employer. The Bidder shall notify the Employer of such discoveries and carry out the Employer's instructions for dealing with them.

20. Possession of the Site

20.1. The Employer shall give possession of the Site to the Bidder in accordance with the Contract Data. If possession of minimum 75% of the site is not given by the agreed date stated in the Contract Data, then the lighting works Completion Date shall be postponed by the Employer as may be required for that particular part/stretch. However, this will not be applicable if sufficient work site is made available to the Bidder as and when required, for him to proceed ahead with progress of work and if available work fronts remain unattached/unutilized. Please note that except time extension no other compensation shall be provided.

21. **Access to the Site**

21.1. The Bidder shall allow the Employer and any person authorized by them access to the Site, to any place where work in connection with the Contract is being carried out or is intended to be carried out and to any place where materials or plant are being manufactured / fabricated / assembled /stored for the Works.

21.2. Commencement of the Project

21.3. The Bidder shall commence the Works on Site within the period stated in the Contract Data after receipt by him of a Notice to this effect from the Employer, to be issued within 30 days after signing of the Agreement. Thereafter, the Bidder shall proceed with the Works with due expedition and without delay.

The requirement to commence the Works at Site shall be fulfilled if:

- a. A program has been submitted in accordance with Clause 25 of Conditions of Contract;
- b. The Bidder's authorized representative, with full supporting staff are in position at the Site;
- c. Equipment, Plant, materials and labor for the work programmed for execution in the first two months have been mobilized at the Site.

22. **Instructions**

22.1. The Bidder shall carry out all instructions of the Employer pertaining to the Works, which comply with the applicable laws where the Site is located.

23. **Disputes**

23.1. If either party believes that a decision taken by the Employer/Bidder was either outside the Contract or that the decision was wrongly taken, the objecting party may file notice of dispute to the other party stating that it is giving the notice pursuant to this Clause while stating clearly the basis for the dispute within 21 days of the notification of the decision.

23.2. The party receiving the dispute notice will consider it and reply in writing within 28 days of receipt of the notice. If no reply is received or the reply is not acceptable to the other party, the affected party may refer the dispute for Arbitration to the Arbitral Tribunal.

24. **Procedure for Disputes – Arbitration**

24.1. The arbitration shall be conducted in accordance with the arbitration procedure stated in Clause 7 of the Special Conditions of Contract.

B: TIME CONTROL

25. Program

25.1. Within the time stated in the Contract Data, the Bidder shall submit to the Employer for consent, an updated Program for the awarded Works including Quality Control, Environment and Traffic Management Plans (*as per IRC:SP:55-2014 and Annexure -5B*) showing the general methods, arrangements, order, and timing for all the activities in the Works along with monthly cash flow forecast (Annexure 3A & 3B).

25.2. An update of the Program shall be a program showing the actual progress achieved on each activity and the effect of the progress achieved on the timing of the remaining work including any changes to the sequence of the activities.

25.3. If the Bidder does not submit an updated Program within this period as specified in the Contract Data, the Employer may withhold the amount stated in the Contract Data from the next payment certificate and continue to withhold this amount until the next payment after the date on which the overdue Program has been submitted. An updated Program is to show the effect of Variations and Compensation Events.

25.4. The Employer's consent of the Program shall not relieve the Bidder of his obligations.

26. Extension of the works Completion Date

26.1. The Employer shall extend the works Completion Date as stated in the Contract Data, if a Compensation Event occurs or a Variation is issued which makes it impossible for completion to be achieved by the works Completion Date, without the Bidder taking steps to accelerate the remaining work and which would cause the Bidder to incur additional cost.

26.2. The Employer shall decide whether and by how much to extend the works Completion Date, within 28 days of the Bidder asking the Employer for a decision upon the effect of a Compensation Event or Variation and submitting full supporting information. If the Bidder has Failed to give early warning of a delay or has failed to cooperate in dealing with a delay, the delay by this failure shall not be considered in assessing the new Lighting works Completion Date.

26.3. Deleted.

26.4. Employer is fully empowered to grant extension to the lighting works Completion Date.

26.5. Force Majeure will be applicable on back-to-back basis as per relevant clause of Concession Agreement between NHAH and Employer.

27. Delays Ordered by the Employer

27.1. The Employer may instruct the Bidder to delay the start or progress of any activity within the Works.

27.2. Deleted.

28. Management Meetings

28.1. Either the Employer or the Bidder may require the other to attend a management meeting/site visit. The business of a management meeting shall be to review the progress of work plans for remaining work and to deal with matters raised in accordance with the early warning procedure.

28.2. The Employer shall record the business of management meetings and shall provide copies of his record to those attending the meeting. The responsibility of the parties for actions to be taken is to be decided by the Employer either at the management meeting or after the management meeting and stated in writing to all those who attended the meeting. Failure to attend the management meetings/site visits shall attract penalties at the rate indicated in the Contract Data and in case of non-attendance of more than three such meetings/visits by the Bidder, then the same shall be construed as fundamental breach of the Contract in terms of Clause 54.

28.3. Maintenance Works Program and Review Meetings

(a) Deleted.

(b) Deleted

28.4. Monthly progress reports shall be prepared by the Bidder and submitted to the Employer in six hard copies and one soft copy. The first report shall cover the period upto the end of the first calendar month following the Start Date. Reports shall be submitted within 7 days for each month thereafter.

Each report shall include:

- (i) status of availability of site and problems related thereto, if any,
- (ii) status of mobilization and working of equipment & machinery,
- (iii) details of progress of work with charts and photographs,
- (iv) comparison of actual and planned progress, with details of any events or circumstances which may jeopardize the completion in accordance with the Contract, and the measures being (or to be) adopted to overcome delays,
- (v) status of procurement of material required for the work,
- (vi) list of Variations, notices given etc.,
- (vii) construction problems encountered, if any,

- (viii) copies of quality control documents, tests results and certificate of materials,
- (ix) safety statistics, including details of any hazardous incidents and activities, related to environmental aspects and public relations,
- (x) weather record during the month, day by day, and
- (xi) any other details/matters related to the Work.

29. Early Warning

29.1. The Bidder is to warn the Employer at the earliest opportunity of specific likely future events or circumstances that may adversely affect the quality of the Work, increase the Contract Price or delay the execution of the Works. The Employer may require the Bidder to provide an estimate of the expected effect of the future event or circumstance on the Contract Price and Contract Completion Date. The estimate is to be provided by the Bidder as soon as reasonably possible.

29.2. The Bidder shall cooperate with the Employer in making and considering proposals as to how the effect of such an event or circumstance can be avoided or reduced by anyone involved in the work and in carrying out any resulting instruction of the Employer.

C: QUALITY CONTROL

30. Identifying Defects

- 30.1. The Employer shall check the Bidder's work and notify the Bidder of any Defects that are found. The Employer may instruct the Bidder to search for a Defect and to uncover and test any work that the Employer considers may have a Defect. Such checking/instructions shall not absolve the Bidder of his responsibilities.
- 30.2. The Bidder shall permit the Site visits of the Employer's Technical Auditor/Independent Engineer/Lenders' Engineer to check the Bidder's work and notify the Employer and the Bidder of any Defects that are found. Such a check shall not absolve the Bidder's or the Employer's responsibility as defined in the Contract.

31. Tests

- 31.1. Bidder shall carry out all Quality Test / relevant Test as per relevant applicable MoRTH & IRC Specifications. All necessary testing / test certificate for material used / work executed shall be carried out / provided by the Bidder to the full satisfaction of Employer/IE and Test Reports shall be submitted along with RA Bills
- 31.2. The Bidder shall be responsible for carrying out the tests prescribed for the Works.
- 31.3. The Bidder shall, at his cost, establish suitable testing facility with adequate and suitable equipment and survey equipment in the vicinity of the work Site premises, as prescribed in the Specifications, to the satisfaction of the Employer.
- 31.4. If the Employer instructs the Bidder to carry out a test not specified in the Specification to check whether any work has a defect and the test shows that it does, the Bidder shall pay for the test and sample. If it shows that the work is not defective, then the Employer shall pay for the test and samples.
- 31.5. The Bidder shall furnish all test results as per the approved Quality Control Plan to the Employer, in a monthly progress report as per Sub Clause 28.4 or at a frequency directed by the Employer. The Employer may withhold payment for those works where test results have not been submitted.
- 31.6. The LED lights & fixtures will be under OEM warrantee period of 5 years from date of final completion certificate issued by Employer to Bidder for the entire works.
- 31.7. The Bidder shall provide OEM Warranty certificates for LED Fixtures in favor of BAEL for a period of 5 years from date of handover.

32. Correction of Defects

32.1. The Bidder shall undertake measures to rectify the defects in the Work identified by the Employer or any of the Employer's authorized representative at the earliest, but not later than the time period specified by the Employer.

32.2. In case of any failure in quality assurance and performance standards, the Bidder shall rectify the defects at his own risk and cost within 15 days, failing which Employer may im-pose a penalty and can get the rectification done at the risk and cost of the Bidder.

32.3. The Defect Liability Period shall be as given in the Contract Data. The Employer shall give notice to the Bidder of any defects before the end of the Defects Liability Period. The Defects Liability Period shall be extended for as long as defects remain to be corrected.

32.4. After completion of DLP of 18 months, the Bidder shall facilitate replacement of any faulty lights/fixtures under OEM Warranty through OEM and shall provide such Undertaking to that effect. Any assistance in replacement of LED lights/fixtures in the warranty period shall be provided by BAEL after such requests are made by the Bidder

33. Uncorrected Defects

33.1. If the Bidder has not corrected a defect to the satisfaction of the Employer, within the time specified in the Employer's notice, the Employer will assess the cost of having the defect corrected, and the Bidder will pay this amount. In case of failure to pay, the same shall be deducted from any payment due to the Bidder/recovered from his Bank Guarantees under intimation to the Bidder.

D: COST CONTROL

34. Financial Bid

34.1. The Bidder shall prepare the design for street lighting works considering minimum requirement of 40 lux & based on the design, Financial Bid shall be prepared. Post issuance of Letter of Award to the Bidder, the Bidder shall submit design & drawing and seek approval from BAEL/IE/NHAI. However, the FINANCIAL BID may get revised subject to revision in design & drawings as per comments /approval from BAEL/IE/NHAI.

34.2. The Financial Bid- Part A shall contain items for Design, supply, installation, testing and commissioning works to be executed by the Bidder.

34.3. The Financial Bid shall also contain electrical connections – Part B to be executed by the Bidder.

34.4. The Financial Bid shall be the basis to calculate the payment for the above executed works. The Bidder is paid for the quantity of the work done at the rate in the Financial Bid for each item.

34.5. Deleted

35. Changes in the Prices

35.1. Deleted

35.2. The change in price due to modifications in design/drawings as per approval from Employer/IE/NHAI, that is, Variation in Bill and in the Financial Bid, Section 6 of the Bid Document (Volume 2) shall be considered for additional payment as per rates defined in Financial Bid.

35.3. If requested by the Employer, the Bidder shall provide the Employer with a detailed cost breakdown of rate of any item in the Financial Bid.

35.4. ***Barwa Adda Expressway Limited*** is fully empowered to approve the variation of quantity and rates for extra item on the merit of the case.

36. Variations

36.1. The lumpsum price basis quoted for financial Bid shall remain fixed irrespective of any Quantity Variation.

36.2. All Variations during implementation of the works shall be included in updated Programs produced by the Bidder.

36.3. Deleted

37. Payments for Variations

37.1. Deleted

37.2. If the event of variation is in terms of additional/extra item(s) or substitution of any item(s) in the Financial Bid with new item(s), then the rates for the items shall be decided on mutual consent.

37.3.

(a) Deleted

(i) Deleted

(ii) Deleted

(iii) Deleted

(iv) Deleted

(v) Deleted

38. Cash Flow Forecasts

38.1. When the Program is updated, the Bidder shall provide the Employer with an updated cash flow forecast.

39. Payment Certificates

39.1. Lighting works

(a) The Bidder is required to measure the work under the observation and control of the Employer. The Bidder shall submit to the Employer monthly statements of the estimated value of the work executed, less the cumulative amount certified previously and, applicable statutory deductions, outstanding advances supported with detailed measurements of the items of work executed, approved request for inspections (RFI) for the work done during the month, applicable rates and other relevant details, both in hard and soft form (in a Compact Disk of size acceptable to the Employer) along with an abstract statement, in accordance with the provisions of this Contract.

- (b) The Employer shall ascertain and determine by measurement the value of the work in accordance with the Contract. The Employer shall exclude any item in a previous certificate or reduce the proportion of any item previously certified in the light of later information.
- (c) The value of work executed shall comprise the value of lump sum price of the items in the Financial Bid.
- (d) The value of work executed shall include the valuation of Variations.
- (e) Items of the Works for which no lumpsum price has been provided in the financial Bid will not be paid for by the Employer and shall deemed to be covered by other rates and prices in the Contract.
- (f) The certification and payment methodology for supply, installation, testing & commissioning works shall be as given below:
 - (i) The Bidder shall prepare and submit the running account bill as per the milestones for Procurement & Supply of Lighting materials and on monthly basis for Installation Part. The payment milestones shall be given in the contract data.
 - (ii) Employer shall evaluate the payment request in terms of the works executed as per milestones, and if the Employer finds the payment request in order, Employer shall recommend to Project management consultant/ Lender's Independent Engineer for certification of the Bidder's RA bill.
 - (iii) 5% of Retention Amount shall be deducted from each RA Bill which shall be released on successful completion of Defect Liability Period of 18 months. In case Bidder requests for releasing retention money earlier, the same shall be released to the Bidder only upon submission of bank guarantee for equivalent amount from an approved scheduled bank/ nationalized bank in approved format with validity till completion of Defects Liability Period of 18 months.
 - (iv) The Bidder must submit invoices of material purchase for executed works with RA Bills. The RA Bills will not be processed further for release of payment in absence of the material invoices and test reports. Bidder shall also submit original copies relevant Manufacturer Test Certificate and warranty related authentic documents for material used in the work as per relevant Codal Provision at the time of supply of material at site.

39.2. Deleted

40. Delayed and Disputed Payments

40.1. Deleted

41. Compensation Events

41.1. Deleted

42. Tax

42.1. The rates quoted by the Bidder shall be deemed to be inclusive of GST and all other applicable taxes including duties/royalties/levies as may be levied by Central/State Governments and local bodies that the Bidder will have to pay for the performance of this Contract. The Employer will perform such duties in regard to the deduction of such taxes at source as per applicable law on the date of payment of the Bidder's bill.

43. Currencies

43.1. **All payments shall be made in Indian Rupees only.**

44. Changes in Cost and Legislation

44.1. Price Adjustment

Deleted

44.2. Other Changes in Cost

Deleted

44.3. Adjustment Formulae

Deleted

44.4. Base, Current and Provisional Indices

Deleted

44.5. Limit of Price Adjustment

Deleted

45. Liquidated Damages and Penalty

45.1. Lighting works

Liquidated damages shall be imposed at 0.25% of Contract Value per week of delay limited to 10% of the total Contract Value applicable to each milestone completion. However, these Liquidated damages shall be returned on successful completion of the subsequent milestones within scheduled completion date. In case of delay beyond the scheduled completion date, the liquidated damages imposed shall not be returned.

46. Deleted

47. Advance Payment

47.1. The Employer shall, make interest free advance payment to the Bidder, on his request, of the amounts and by the date stated in the Contract Data, against provision by the Bidder of an unconditional Bank Guarantee for an amount equal to the advance payment. The Bank Guarantee, in the prescribed format is acceptable from the following institutions located in India:

- (a) State Bank of India or its subsidiaries;
- (b) Any Indian Nationalized /scheduled Bank;
- (c) Foreign Bank with operations in India provided the net worth in respect of the Indian operations shall not be less than Rs 500 crores as per the latest Annual Report of the Bank and that Bank Guarantee is issued by a branch in India.

The guarantee shall remain effective until the advance payment has been fully recovered, but the amount of the guarantee can be progressively reduced by the amounts repaid by the Bidder.

47.2. The Bidder is to use the advance payment only to pay for Equipment, Plant and Mobilization expenses required specifically for execution of the Works. The Bidder shall demonstrate that advance payment has been used in this way by supplying copies of invoices or other documents to the Employer.

47.3. The advance payment shall be recovered by deducting proportionate amounts as indicated in the Contract Data, from payments otherwise due to the Bidder, following the schedule of completed percentages of the Works on a payment basis. No account shall be taken of the Mobilization & Equipment/Plant advance payment or its repayment in assessing valuations of work done, Variations, price adjustments, Compensation Events, or liquidated damages.

47.4. Deleted

48. **Performance Bank Guarantee (Securities)**

48.1. Bidder shall furnish a Performance Security to the Employer of a sum equivalent to 5% of Agreed Contract Value (Excluding GST) as security for due and faithful performance of its obligations, under and in accordance with the Agreement, during the Work completion Period which shall remain in force and effect till the end of 28 days from Defects Liability Period of 18 months.

49. **Cost of Maintenance**

49.1. Loss or damage to or defective works or materials during the execution of Works shall be remedied by the Bidder at the Bidder's cost to the satisfaction of the Employer.

E: FINISHING THE CONTRACT

50. Completion

50.1. The Bidder shall request the Employer to issue a certificate of completion of Lighting works and the Employer shall do so upon deciding that the Lighting Work is completed.

50.2. No later than 30 days prior to the Contract Completion Date, the Bidder and the Employer shall conduct a condition survey of all the items mentioned in the Road Asset Groups and the items not confirming to the specified Intervention Standard shall be recorded.

Where items not meeting the specified Interventions Standard are identified, the Employer shall:

- (a) provide a written record of the condition survey to the Bidder within 14 days of the completion of the survey. The Employer's decision on the condition of any item of Road Asset Group shall be final.
- (b) direct the Bidder to rectify the deficiencies within the specified Rectification Standard / Period.

50.3. On satisfactory completion of Defect Liability Period, the Bidder shall request the Employer to issue a Certificate of Completion of the Contract. The Employer shall, issue such certificate subject to the Bidder satisfying all provisions under the Contract.

51. Taking Over

51.1. Taking over of the works & Sections

The Works shall be taken over by the Employer when the Works have been completed in accordance with the Contract. The Bidder may apply by notice to the Employer for a Taking-Over Certificate within 14 days. The Employer shall, within 28 days after receiving the Bidder's application issue the Taking-Over Certificate to the Bidder/ reject the application, giving reasons and specifying the work required to be done by the Bidder. If Employer fails to take-over within 28 days of properly completed works, it is deemed to have been taken over.

51.2. Taking over of the Part of the works

No taking-over of part of the Works unless stated in Contract or agreed by both the parties.

51.3. Interference with Tests on Completion

If the Bidder is prevented, for more than 14 days, from carrying out the Tests for which the Employer is responsible, the Bidder shall carry out the Tests.

If Bidder suffers delay and incurs cost due to delay extension of time and Bidder's claim will be applicable.

52. Final Account

52.1. In case of Lighting works, the Bidder shall supply to the Employer a detailed account of the total amount that the Bidder considers payable under the Contract within 60 days after the issue of certificate of completion of lighting works by the Employer as per Sub Clause 50.1. The Employer shall certify any final payment that is due to the Bidder within 60 days of receiving the Bidder's account. If the Employer is not satisfied with the detailed account, then the Employer shall issue within 30 days thereto a schedule that states the scope of the corrections or additions that are necessary. If the Bidder fails to comply with the Employer's instructions within 15 days, Employer will certify as per the schedule of Corrections or addition sent to Bidder and make payment to the Bidder within 45 days.

52.2. The Bidder shall submit his Final Statement of Account within 45 days of the Contract Completion Date and the Employer shall certify within 45 days and submit to the Employer any final payment that is due to the Bidder. Thereafter, the Employer shall make payment to the Bidder within 30 days. If the Employer is not satisfied with the detailed account, then the Employer shall issue within 30 days, thereto, a schedule that states the scope of the corrections or additions that are necessary. If the revised final account is still unsatisfactory after it has been resubmitted, the Employer shall decide on the amount payable to the Bidder and issue a payment certificate within 30 days of receiving the Bidder's revised final account.

53. As Built Drawings and Maintenance Manuals

Deleted

54. Termination

54.1. The Employer or the Bidder may terminate the Contract if the other party causes a fundamental breach of the Contract.

54.2. Fundamental breach of the Contract includes, but shall not be limited to the following:

- (a) the Bidder stops work for 28 days when no stoppage of work is shown on the current program and the stoppage has not been authorized by the Employer;
- (b) the Employer or the Bidder is made bankrupt or goes into liquidation, other than for purposes of reconstruction or amalgamation;
- (c) a payment for certified bills is not paid by the Employer to the Bidder within 60 days of the date of the Employer's certificate;
- (d) the Employer gives notice that failure to correct a particular Defect is a fundamental breach of the Contract and the Bidder fails to correct it within a reasonable period of time determined by the Employer;
- (e) Deleted;
- (f) the Bidder has defaulted in fulfilling his obligations under this Contract;

- (g) the Bidder has contravened Sub-Clause 9.2;
- (h) the Bidder does not adhere to the agreed works program as per Clause 25 and also fails to attend the management meetings (Clause 28);
- (i) the Bidder fails to carry out instructions of the Employer within a reasonable time determined by the Employer in accordance with the Sub Clauses 15.1, 22.1 and 45.1;
- (j) the Bidder has delayed the completion of the Works beyond the period for which the maximum amount of liquidated damages has become payable as defined in the Contract Data;
- (k) if the Bidder, in the judgment of the Employer has engaged in corrupt, fraudulent or coercive practices as defined in Sub Clause 34.1 (a) of ITB in competing for or in executing the Contract.
- (l) Deleted

54.3. When either party to the Contract gives notice of a breach of contract to the Employer for a cause other than those listed under Sub Clause 54.2, the Employer shall decide whether the breach is fundamental or not.

54.4. Notwithstanding the above, the Employer may terminate the Contract for convenience.

54.5. If the Contract is terminated, the Bidder shall stop work immediately, make the Site safe and secure and leave the Site as soon as reasonably possible.

55. **Payment upon Termination**

55.1. If the Contract is terminated because of a fundamental breach of the Contract by the Bidder, the Employer shall issue a certificate for the value of the work done less advance payments made up to the date of the issue of the certificate, less other recoveries due in terms of the Contract, less taxes due to be deducted at source as per applicable law and less the percentage to apply to the work not completed as indicated in the Contract Data. If the total amount due to the Employer exceeds any payment due to the Bidder, the difference shall be a debt payable to the Employer. For this purpose, retention money recovered shall stand forfeited in favor of the Employer without any restrictions or preconditions.

55.2. If the Contract is terminated at the Employer's convenience or because of a fundamental breach of the Contract by the Employer, the Employer shall issue a certificate for the value of the work done, the reasonable cost of removal of Equipment, repatriation of the Bidder's personnel employed solely on the Works, and the Bidder's costs of protecting and securing the Works and less advance payments received up to the date of the certificate, less other recoveries due in terms of the Contract and less taxes due to be deducted at source as per applicable law and the Employer shall pay.

56. **Property**

56.1. If the Contract is terminated because of Bidder's default, all materials on the Site, Plant, Equipment, Temporary works and the Works are deemed to be the property of the Employer, till completion of the work. The Employer shall make use of the available materials and equipment for completion of the Work.

57. **Release from Performance**

57.1. If the Contract is frustrated by the outbreak of war or by any other event entirely outside the control of either the Employer or the Bidder, the Employer shall certify that the Contract has been frustrated. The Bidder shall make the Site safe and stop work as quickly as possible after receiving this certificate and shall be paid for all Works carried out before receiving the certificate and for any work carried out afterwards to which commitment was made.

58. **Details to be Confidential.**

58.1. The Bidder shall treat the details of the Contract as private and confidential and shall not publish or disclose the same or any particulars thereof in any trade or technical paper or elsewhere without the previous consent in writing of the Employer. If any dispute arises causing the necessity of any publication or disclosure for the purpose of the Contract, the same shall be referred to the Employer whose determination shall be final.

59. **Life-saving Appliances and First-aid Equipment**

59.1. The Bidder shall provide and maintain upon the Works and the Site, sufficient, proper and efficient life-saving appliances and first-aid equipment, to the satisfaction of the Employer. The appliances and equipment shall be available for use at all times during the pendency of the Contract.

SECTION: 3

PART – II: SPECIAL CONDITIONS OF CONTRACT

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| 7 Arbitration | 64 | Annexure – 3A | 67 |
| B Maintenance Management System | | Bidder’s Work Program and Cash flow forecast | |
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| 9 Deleted | 65 | Monthly Cash Flow Forecast | |

PART – II SPECIAL CONDITIONS OF THE CONTRACT (SCC)

A: GENERAL

1. Labor

- 1.1. The Bidder shall, unless otherwise provided in the Contract, make his own arrangements for the engagement of all staff and labour, local or other, and for their payment, housing, feeding and transport.
- 1.2. The Bidder shall, if required by the Employer, deliver to the Employer a return in detail, in such form and at such intervals as the Employer may prescribe, showing the staff and the numbers of the different classes of labour from time to time employed by the Bidder on the Site and such other information as the Employer may require.
- 1.3. During continuance of the Contract, the Bidder and his Sub-Bidders shall abide at all times by all existing labour enactments and rules made thereunder, regulations, notifications and bye laws of the State or Central Government or local Employer and any other labour law (including rules) that may be passed or notification that may be issued under any labour law in future either by the State or the Central Government or any competent Employer.
- 1.4. The Bidder shall keep the Employer indemnified in case any action is taken against the Employer by the competent Authority on account of contravention of any of the provisions of any Act or rules made thereunder, regulations or notifications including amendments. If the Employer is caused to pay or reimburse, such amounts as may be necessary to cause or observe, or for non-observance of the provisions stipulated in the notifications/bye laws/Acts/Rules/regulations including amendments, if any, on the part of the Bidder, the Employer shall have the right to deduct any money due to the Bidder. The Employer shall also have the right to recover from the Bidder any sum required or estimated to be required for making good the loss or damage suffered by the Employer.
- 1.5. The employees of the Bidder and the Sub-Bidder in no case shall be treated as the employees of the Employer at any point of time.

2. Statutory Clearances

- 2.1. List of clearances to be obtained by the Employer and the Bidder are given below. It may be noted that the list below may not be exhaustive and in case any additional clearances are required, the same shall be procured by the Bidder, unless otherwise specified in the Law / guidelines of statutory agencies.

(a) **Employer's Responsibility:**

- (i) Environmental clearance for the project, if any;
- (ii) Permission for shifting of utilities;
- (iii) Permission for cutting trees;
- (iv) Land acquisition;

(b) **Bidder's Responsibility:**

- (i) All police and traffic management related clearances at the work sites;
- (ii) Employing labour and other labour related clearances (ESI / Contract Labour / Health / PF etc.);
- (iii) Electrical connections and Water Supply;
- (iv) Employment of migrant labour;
- (v) Establishing and operating labour camps;
- (vi) Location of fuel storage tanks / containers etc.;
- (vii) Clearances for using / storing explosives;
- (viii) All clearances required from the Fire Department; and
- (ix) Any other clearances that are not specifically included in Employer's list and may be required according to prudent utility practices or instructed by Employer/as per Concession Agreement.

3. **Revision of Quality Control Plan**

3.1. The Employer shall instruct the Bidder to revise and/or resubmit his Quality Control Plan, if required before giving approval. The Bidder shall implement any required changes to improve the Quality Control Plan. The approval of the Employer shall not absolve the Bidder of his responsibilities and obligations under the Contract.

4. **Measuring / Monitoring Equipment**

4.1. The Bidder shall ensure properly calibrated and functional measuring/ monitoring equipment, to the satisfaction of the Employer, at all times during the Contract.

5. Deleted

6. Deleted

7. **Arbitration (Refer GCC Sub Clause 24.1)**

7.1. The procedure for arbitration shall be as follows:

(a) In case of Dispute or difference arising between the Employer and the Bidder relating to any matter arising out of or connected with this agreement referred for arbitration, shall be settled in accordance with the Arbitration and Conciliation Act, 1996.

(b) The Arbitral Tribunal shall consist of three Arbitrators, one each to be appointed by the Employer and the Bidder. The third Arbitrator shall be

chosen by consensus by the two Arbitrators so appointed by the Parties and shall act as the Presiding Arbitrator. In case of failure of the two Arbitrators appointed by the parties to reach upon a consensus within a period of 30 days from the appointment of the Arbitrators, then the Presiding Arbitrator shall be appointed by the Indian Roads Congress on the request of the Employer.

- (c) If one of the parties fails to appoint its Arbitrator in pursuance of Sub Clauses (a) and (b) within 30 days after receipt of the notice of the appointment of its Arbitrator by the other party, then the Indian Roads Congress shall appoint the Arbitrator on the request of the Employer. In case the Employer fails to do so within 30 days, the Bidder will approach the Indian Roads Congress for appointment of Arbitrator. A certified copy of the order of the Indian Roads Congress, making such an appointment shall be furnished to each of the parties.
- (d) Arbitration proceedings shall be held at Mumbai and the language of the arbitration proceedings and that of all documents and communications between the parties shall be English.
- (e) The decision of the majority of Arbitrators shall be final and binding upon both parties. The cost and expenses of Arbitration proceedings will be paid as determined by the Arbitral Tribunal and shared equally by both the parties.
- (f) Performance under the Contract shall continue during the arbitration proceedings and payments due to the Bidder by the Employer shall not be withheld, unless they are the subject matter of the arbitration proceedings.

B: MAINTENANCE MANAGEMENT SYSTEM

8. **Deleted**

9. **Deleted**

C: GENERAL MAINTENANCE REQUIREMENTS

10. **Maintenance Survey**

Deleted

11. **Management of Spoil and Excess Road Making Material**

Deleted

12. **Underground Sewer Pipelines**

Deleted

**D: EVALUATION OF SERVICE QUALITY LEVELS FOR PAYMENT OF
MONTHLY CERTIFICATE FOR MAINTENANCE WORKS**

13. **Deleted**

14. **Compliance by Bidder**

Deleted

BIDDER’S WORKS PROGRAM AND CASH FLOW FORECAST

Bidder shall cover the following:

1. Program of Supply & Installation, backed with material planning and deployment, duly supported with broad calculations as per Site handing over.
2. Critical Path Method and Schedule and/PERT or bar chart, with resource allocations based on Bidder’s work program.
3. Quality assurance procedures proposed to be adopted.
4. A concise method statement in narrative form covering all major activities.
5. Details of Bidder’s schedule of site takeover
The Bidder shall include additional INFORMATION necessary to complement and accurately describe the proposed work program and possession of site schedule.

SECTION 4:

CONTRACT DATA

CONTRACT DATA

| Sr. No. | Item | Clause Reference of CC | | | | | | | | | |
|---------------------|--|---------------------------------|----------------------|----------------------------|---------------------|--|--|---|---|---------------------------------|-----------|
| 1 | The Employer is : Barwa Adda Expressway Limited The IL&FS Financial Center, Plot C-22, G Block, Bandra Kurla Complex, Mumbai- 400051 Tel.: +91 022-26593693/022-26594804 E-mail: tender. itnl.projectbids@itnlindia.com Website: www.itnlindia.com Contact Person- Mr. Ravi Praveen Kumar/ Mr. Sachin Joshi | 1.1 GCC | | | | | | | | | |
| 2 | The Employer is BAEL | 1.1 GCC | | | | | | | | | |
| 3 | The project work is “Design, Supply, Installation, Testing & Commissioning for LED Lighting works at various locations within km 398.240 to km 521.120 on Barwa Adda Panagarh Road Project in the States of Jharkhand and West Bengal” (“Project”). | 1.1 GCC | | | | | | | | | |
| 4 | The Works consists of Design, Supply, Installation, testing & commissioning for Lighting works as per scope of works & Technical Specifications. Financial Bid is enclosed at Volume 2 – Section 6 | 1.1 ITB | | | | | | | | | |
| 5 | The Start Date (Commencement Date) shall be within 7 days from the date of issue of Letter of Award / signing of the Contract Agreement for the works whichever is earlier. | 1.1 and 21.2 GCC | | | | | | | | | |
| 6 | The language of the Contract documents is English | 3 GCC | | | | | | | | | |
| 7 | The law which applies to the Contract is the laws of Union of India | 3 GCC | | | | | | | | | |
| 8 | The following documents are also part of the Contract in addition to documents mentioned in Sub Clause 2.2 of GCC: Details of Minimum Key Construction Plant and Equipment required to be mobilized by Bidder for the works (as per Annexures–1A) Deleted | 4.4 (a) of ITB 9 GCC | | | | | | | | | |
| 9 | Insurance requirements are as under: <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Sr. No.</th> <th style="text-align: left;">Description of Cause</th> <th style="text-align: left;">Minimum Cover of Insurance</th> </tr> </thead> <tbody> <tr> <td colspan="3"><i>During works</i></td> </tr> <tr> <td style="text-align: left;">i</td> <td>Bidder’s All Risk Policy covering loss or damage to Works, and Material for full replacement value including earthquake, terrorism,</td> <td>Contract Price + 15% escalation</td> </tr> </tbody> </table> | Sr. No. | Description of Cause | Minimum Cover of Insurance | <i>During works</i> | | | i | Bidder’s All Risk Policy covering loss or damage to Works, and Material for full replacement value including earthquake, terrorism, | Contract Price + 15% escalation | 13 GCC |
| Sr. No. | Description of Cause | Minimum Cover of Insurance | | | | | | | | | |
| <i>During works</i> | | | | | | | | | | | |
| i | Bidder’s All Risk Policy covering loss or damage to Works, and Material for full replacement value including earthquake, terrorism, | Contract Price + 15% escalation | | | | | | | | | |

| | | |
|----|--|-----------|
| | <p>storm, tempest, flood, inundation cover & defect liability cover.</p> <p>ii Loss or damage to Property, other than (i) and (ii) above, in connection with the Contract ₹ 50 Lakh</p> <p>iii Personal injury or death insurance. Unlimited number of accidents. After each accident, Bidder will pay additional premium necessary to increase the limit make insurance valid for unlimited number of accidents always ₹ 5 Lacs per person per accident for unlimited number of accidents</p> <p>v Public Liability Policy</p> <p>i) For duration of the Project – ₹ 1 Crore</p> <p>ii) Any one accident – ₹ 0.50 Crore/accident</p> <p>vi Against liabilities for death or injury to any person or loss of or damage to any third-party property In accordance with statutory requirements, applicable in India.</p> <p>vii Advance Loss of Profit Policy Sum sufficient to cover anticipated loss</p> <p>viii Any other insurance cover In accordance with statutory requirements, applicable in India.</p> <p>Note: For the above purpose “Roads” include: Main road with service roads, subways, culverts, toe wall, dividing median, crash barriers, electrical poles, separator, public toilets etc. and other infrastructure related to insured trade including sign boards and other property of the project along with electrical fittings, side separator, crash barrier, dividing median various culverts, Cat Eyes, Delineators, W-Beam Crash Barrier, Gantry Sign Boards, Single LED Sign Boards, Double legged Sign Boards, Cantilever Sign Boards, Bollards, Road Marking, and other properties of insured.</p> | |
| 10 | <p>Contract Completion Date for:</p> <p>i. Lighting works: - 6 Months from the Start Date of the Works</p> <p>(b) Defect Liability Period: - 18 Months for civil & electrical works & 5 years for LED lights & fixtures from date of final completion certificate issued by Employer to</p> | 14 GCC |

| | | | | |
|----|---|--------------------|--|---|
| | Bidder for the entire works respect including the OEM warranty. | | | |
| 11 | The Site Possession shall be given within 3 days from Start Date | | | 20 GCC |
| 12 | The period between Program Updates shall be 30 days | | | 25 GCC |
| 13 | The amount to be with-held for late submission of an updated Program shall be Rs 50,000/- each time | | | 25 GCC |
| 14 | Penalty for not attending Management Meetings/ Site visits including Weekly Meetings: Rs 5000/- per incidence | | | 28 GCC |
| 15 | The following are Compensation Events unless they are caused by the Bidder: (a) Deleted | | | 41 GCC |
| 16 | The item rates to be quoted shall be inclusive of GST. The component of GST shall be released on submission of the GST paid challans and on receipt of payment from NHAI towards the same. The Bidder shall be Responsible for the payment of Labor Cess to the concerned Department. | | | 42.1 GCC |
| 17 | Changes in Cost and Legislation Deleted | | | 44 GCC |
| 18 | Penalty and Liquidated Damages: | | | 45 GCC |
| | S. No. | Particulars | Penalty / Liquidated Damages | |
| | 1 | Delay of work | Penalty shall be applicable @ 0.25% value of the Contract Price per week of delay for non- completion of the work applicable to each milestone completion. However, these Liquidated damages shall be returned on successful completion of the subsequent milestones within Scheduled completion date. In case of delay beyond the scheduled completion date, the liquidated damages imposed shall not be returned. | Maximum cumulative (total) penalty shall be applicable @10% of the Contract Price |
| 20 | Deleted | | | 46 GCC |

| | | |
|----|--|-------------|
| 21 | <p>Interest free Material Advance aggregate amounting to 10% of Contract Value against Bank Guarantee valid up to scheduled work completion date of same amount in a manner & format mutually agreed by the Parties.</p> <p>The Recovery of material advance shall be made proportionately from each monthly RA Bills in a manner commencing on achievement of financial progress of 20% of contract value and shall be completed before 90% of Contract Values disbursed to the Bidder.</p> <p>Form 7H in Section 7 of the Bidding Documents.</p> | 47 GCC |
| 22 | <p>Performance Bank Guarantee: - 5% of Agreed Contract Value (Excluding GST) to be submitted from an approved scheduled bank/ nationalized bank in approved format. The Performance Bond will be valid right through the contract and till the end of 28 days from defects liability period of 18 months.</p> <p>Form 7I in Section 7 of the Bidding Documents.</p> | 48 GCC |
| 22 | <p>Defects Liability Period & Warrantee: 18 Months for civil & electrical works. However, in case of any delay by the Authority for issuing a Final Completion Certificate to Employer due to incomplete or unsatisfactory work of Bidder's scope, DLP shall be started after final completion certificate issued by the Authority to Employer.</p> <p>The LED lights & fixtures will be under OEM warrantee period of 5 years from date of final completion certificate issued by Employer to Bidder for the entire works.</p> <p>The Bidder shall provide OEM Warranty certificates for LED Fixtures in favor of BAEL for a period of 5 years from date of handover. After completion of DLP of 18 months, the Bidder shall facilitate replacement of any faulty lights/fixtures under OEM Warranty through OEM and shall provide such Undertaking to that effect. Any assistance in replacement of LED lights/fixtures in the warranty period shall be provided by BAEL after such requests are made by the Bidder.</p> | 32 GCC |
| 23 | <p>The Works shall be taken over by the Employer when the Works have been completed in accordance with the Contract. The Bidder may apply by notice to the Employer for a Taking-Over Certificate within 14 days. The Employer shall, within 28 days after receiving the Bidder's application issue the Taking-Over Certificate to the Bidder/ reject the application, giving reasons and specifying the work required to be done by the Bidder. If Employer fails to take-over within 28 days of properly completed works, it is deemed to have been taken over.</p> | 51 GCC |
| 24 | Deleted | 55.1 GCC |
| 25 | Deleted | 125 of STS |

| 26 | Deleted | 126 of STS | | | | | | | | | | | | |
|--------|---|---|-------------------|-----------------|---|---|---|---|---|--|---|---|---|-----------|
| 27 | The Bidder shall solely be responsible for implementation of Traffic Management and Diversion during execution of awarded work as per IRC:SP:55-2014 “Guidelines on Traffic Management in Work Zones, other relevant IRC Codes, Clause 112 of Specifications for Road & Bridge Works (5th Revision) and as per Annexure -5B of RFB Volume I. Upon <i>Failing to adhere to implement Traffic Management, Diversion and Safety as per agreed & defined norms the Employer shall have the right to impose deduction of 2% of amount from each Running Account Bill of the Bidder as penalty.</i> | Annexure -5B | | | | | | | | | | | | |
| 28 | Bidder shall carry out all Quality Test/relevant Test as per relevant applicable MoRTH & IRC Specifications. All necessary testing / test certificate for material used / work executed shall be carried out / provided by the Bidder to the full satisfaction of Employer/IE and Test Reports shall be submitted along with RA Bills. | 31 GCC | | | | | | | | | | | | |
| 29 | <p>The Bidder shall prepare and submit the running account bill as per the milestones for Procurement & Supply of Lighting materials and on monthly basis for Installation Part.</p> <p>The payment milestones are as below:</p> <table border="1"> <thead> <tr> <th>Sr No.</th> <th>Payment Milestone</th> <th>% of Work Value</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Delivery & receipt of materials at site</td> <td>60% payment shall be released to the Bidder within 14 working days from submission of E-way bill & PI subject to verification of 100% materials receipt at site by employer</td> </tr> <tr> <td>2</td> <td>Completion of Erection & Installation works</td> <td>20% payment shall be released to the Bidder within 14 working days from submission of PI & verification of works by Employer</td> </tr> <tr> <td>3</td> <td>Testing, Commissioning & Handover to Employer</td> <td>20% payment shall be released to the Bidder within 14 working days from Testing, commissioning & handover documents</td> </tr> </tbody> </table> <p>60% payment of the contract value shall be released to the Bidder only upon delivery & receipt of 100% material at site & verification of materials received at site by BAEL representatives as per the requirement specified in the Bid.</p> | Sr No. | Payment Milestone | % of Work Value | 1 | Delivery & receipt of materials at site | 60% payment shall be released to the Bidder within 14 working days from submission of E-way bill & PI subject to verification of 100% materials receipt at site by employer | 2 | Completion of Erection & Installation works | 20% payment shall be released to the Bidder within 14 working days from submission of PI & verification of works by Employer | 3 | Testing, Commissioning & Handover to Employer | 20% payment shall be released to the Bidder within 14 working days from Testing, commissioning & handover documents | 39 GCC |
| Sr No. | Payment Milestone | % of Work Value | | | | | | | | | | | | |
| 1 | Delivery & receipt of materials at site | 60% payment shall be released to the Bidder within 14 working days from submission of E-way bill & PI subject to verification of 100% materials receipt at site by employer | | | | | | | | | | | | |
| 2 | Completion of Erection & Installation works | 20% payment shall be released to the Bidder within 14 working days from submission of PI & verification of works by Employer | | | | | | | | | | | | |
| 3 | Testing, Commissioning & Handover to Employer | 20% payment shall be released to the Bidder within 14 working days from Testing, commissioning & handover documents | | | | | | | | | | | | |

The material receipt Challans needs to be submitted by the Bidder for verification. The Material (100% procurement) shall be stored at the designated places in consultation with BAEL as directed by Engineer In Charge and shall be jointly recorded. Ward & watch of the procured material shall be the sole responsibility of the Bidder.

The representatives of BAEL and Bidder shall jointly sign off on the material receipt and confirm 100% receipt of the material at site as per the requirement specified in the Financial Bid. The issue of material during construction shall be recorded each time material is issued from the store and jointly signed by BAEL and the Bidder's representative. The record has to be kept safe till successful completion of installation and commissioning of the lighting work.

For installation & Erection part, The Bidder shall submit invoices for the Supply Part along with RA Bills. The RA Bills will not be processed further for release of payment in absence of the material invoices and test reports. The Bidder shall also submit relevant Manufacturer Test Certificate for material used in the work as per relevant Codal Provision at the time of supply of material at site.

Employer shall evaluate the payment request in terms of the works executed as per milestones, and if the Employer finds the payment request in order, Employer shall recommend to Project management consultant/ Lender's Independent Engineer for certification of the Bidder's RA bill.

BAEL shall review / revise (if required) and then certify the same for release of payment. The Bidder shall follow all the procedures stipulated with NHAI for certification of the Running Account bills including the certification of IE & NHAI representative. BAEL will assist the Bidder, however the responsibility of following the same solely lies with the Bidder. Work shall be executed under the supervision of Employer's representatives and payment shall be released to the Bidder after certification from Employer, Project management consultant/ Lender's Independent Engineer.

For Electrical connections, liasioning for application shall be done by Bidder with concerned electrical department & charges for obtaining electrical connections shall be borne by Bidder. 50% payment shall be released to the Bidder upon filing of application in electrical department (Application submission receipt will act as proof for payment) & balance 50% payment shall be released upon work completion. (Charging of connection).

Security Amount deposited by Bidder to Electrical department shall be refunded to Bidder after project completion as the same amount would be

| | | |
|--|--|--|
| | <p>credited to BAEL.</p> <p>Material Invoices: - The Bidder must submit invoices of material Purchase for executed works with RA Bills. The RA Bills will not be processed further for release of payment in absence of the material invoices and test reports. Bidder shall also submit original copies of relevant Manufacturer Test Certificate and warranty related authentic documents for material used in the work as per relevant Codal Provision at the time of supply of material at site.</p> | |
|--|--|--|

SECTION 5: SPECIFICATIONS

| Sr No | Description | Page no |
|--------------|---|----------------|
| 1 | General Technical Specifications | 78 |
| 2 | Annexure A – List of chainages for Lighting works | 90 |
| 3 | Annexure B – Typical cross sectional Design along with schedule | 92 |

SECTION: 5

SPECIFICATIONS

1. General Technical Specifications

- 1.1. The Specifications contained herein shall be read in conjunction with the other Bidding Documents as specified in Section 1.
- 1.2. Wherever reference is made in the Contract to specific standards/codes to be met by the materials, plant, and other supplies to be furnished, and work performed or tested, the provisions of the latest current edition or revision of the relevant standards and codes shall apply, unless otherwise expressly stated in the Contract. Where such standards and codes are national, or relate to a particular country of region, other internationally recognized standards and codes specified will be accepted subject to the Employer's prior review and written approval.

2. General Requirement

The Specifications in accordance with which the entire work shall be constructed and maintained by the Bidder are as described hereunder: The technical specifications for Design, Supply, Installation, Testing & Commissioning for Lighting works is to be carried out by the successful Bidder as mentioned in Annexure II (Volume 2 – Section 6 of RFB)

The project / project facilities under this contract shall conform to the minimum design requirements set out in the Concession Agreement.

3. DESIGN STANDARDS:

As per IRC the highway LED lighting has been designed to obtain Minimum lux value of 40 at Main Carriage Way, Service Road, Major Junctions Truck Lay by etc. The light designs have been done through Lux Calculation software. The concept of light distribution is based on some parameter, viz. spread, throw & control. To indicate the suitability or otherwise for a given application, luminaries characteristics are to be specified by the above parameters based on –

- The extent to which light is thrown along the road
- The degree of sideways spread of light across a road, and
- The amount of control exercised over light emitted at high angles.

Road lighting design involves finding out the various values relevant to the installation viz. the luminance, uniformity ratio, glare value etc. In addition, road

lighting luminaries must withstand winds up to gale force. Wind pressures on the luminaries also influence the design of poles as per IS 875 (Part 3) 2015.

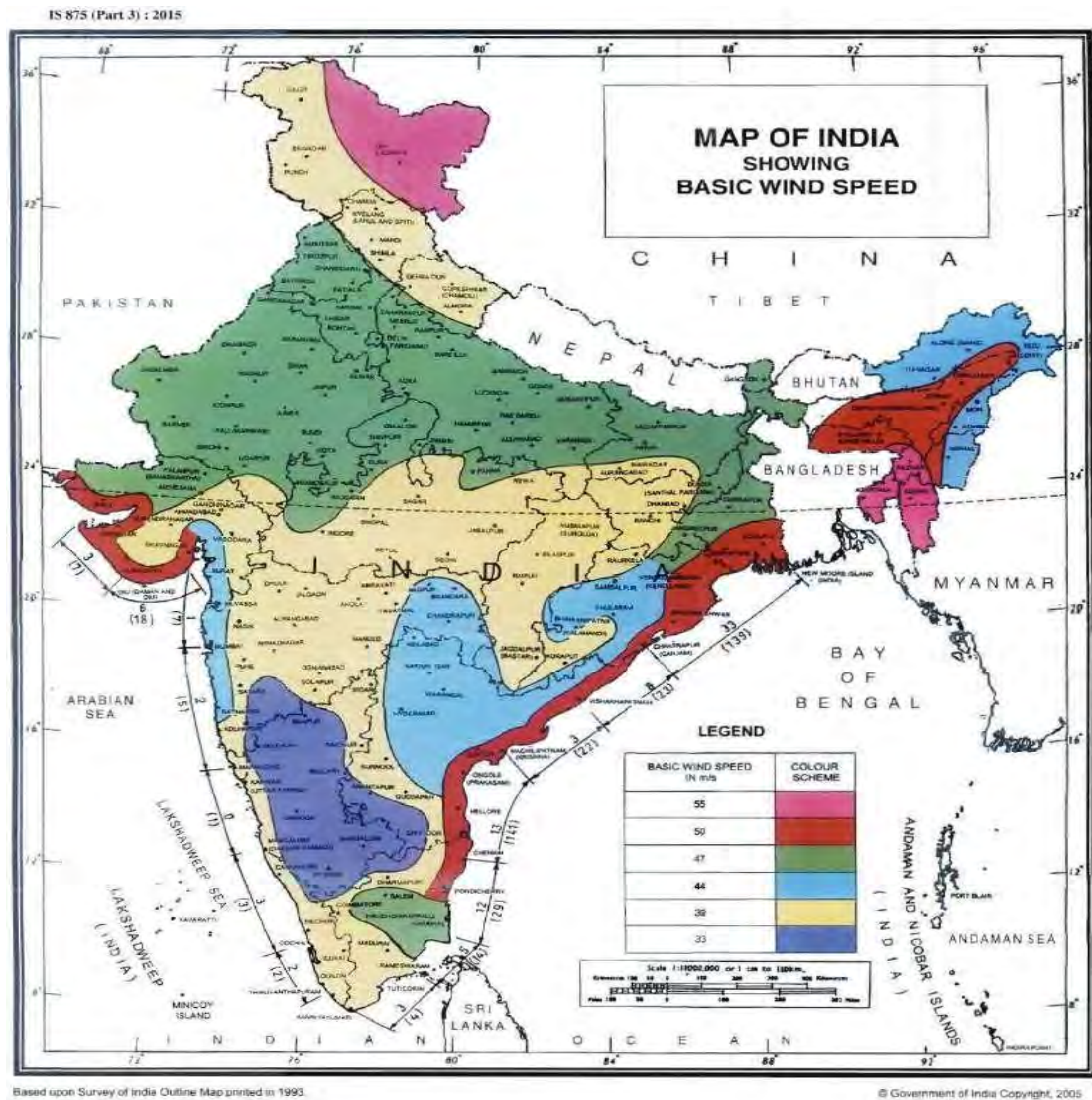


FIG. 1 BASIC WIND SPEED IN m/s (BASED ON 50 YEARS RETURN PERIOD)

4. DESIGN CRITERIA:

4.1 We are proposing energy efficient LED based street lighting that can be coupled with an effective street lighting control by means of a group-based street lighting control system.

4.2 The Technical specifications of Street Lighting, LED illuminations & High Mast is tabulated below:

a) **Streetlight (Pole)**

| Sr. No. | Particular | Requirement |
|---------|-------------------------|---|
| 1 | Make: - | Bajaj, Utkarsh, Valmont, Jindal, Havells or Equivalent make |
| 2 | Length | 9000mm |
| 3 | Top Dia | 70mm |
| 4 | Bottom Dia | 155mm |
| 5 | Thickness of sheet | 3mm |
| 6 | PCD | 260mm |
| 7 | Thickness of Base Plate | 16mm |

b) **LED Luminaires Wattage – As per Design**

| Sr. No. | Particular | Requirement |
|---------|---------------------------|--|
| 1. | Wattage of LED | As per Design |
| 2. | Make and Model No. of LED | Philips, Bajaj, Wipro, Crompton, Havells |
| 3. | Min. Lux to be Achieved | 40 Lux |
| 4. | Warranty on LED Fixtures | 5 Years (60 months) from the date of Commissioning |
| 5. | IP Rating | Min. IP 66/67 |
| 6. | Lumen / Watt | Min. 120 to 145 Lumen / Watt |
| 7. | SPD Protection | 10KV & 5 KV internal & outer |
| 8. | Driver voltage Protection | up to 120V to 395V with potted driver |
| 9. | Lifetime | (up to 50000Hrs) as per L80 |
| 10. | THD | < 20% |
| 11. | Casting | Aluminum Die Cast |
| 12. | Glass | Extra Clear Flat Glass |
| 13. | P.F. | 0.95 |

c) **High Mast Light Specifications:**

| Sr No. | Particular | Requirement |
|--------|-----------------------------|--|
| 1 | Height of High mast- | 30 MTR (Make: - Bajaj, Utkarsh, Valmont, Jindal) |
| 2 | No. of sections | 3 |
| 3 | Material Construction shaft | BS-EN10 025, S-355 |
| 4 | Thickness | Top-3mm Middle-4 mm, Bottom 5 mm |
| 5 | Base & Top Diameter | Bottom- 540 Top- 150 mm |
| 6 | Metal protection Treatment | Hot Dip Galvanized |
| 7 | Method of Dipping- | Single Dipping |

| | | |
|----|------------------------------------|-------------------------|
| 8 | Average Thickness of Galvanization | As per BS EN ISO 1461 |
| 9 | PCD | 650 mm |
| 10 | Foundation Bolt | M30/ 850x12 |
| 11 | Luminaire Capacity | 12 |
| 12 | Grade | AISI 316 |
| 13 | Number of Ropes | 3 Rope System |
| 14 | Construction- | 7/19 |
| 15 | Centre core material | Stainless steel core |
| 16 | Diameter (mm) | 6 mm |
| 17 | Braking Load Capacity | 2350 |
| 18 | Factor of Safety | >5 for system full load |
| 19 | Number of Drum/winch | Double Drum type |
| 20 | Gear Ratio | 53:1 |
| 21 | Capacity | 750 KG |
| 22 | Method of Operation | Manual/Electrical |
| 23 | Lubrication Arrangement | Permanent Oil Bath |

2- LED Luminaires Wattage – 400 W

5. DESIGN PARAMETERS:

- a. Design Lux – 40 Lux (Min.)
- b. Boom Length – 1.0m /1.5m /2.0m /2.5m

6. POWER SUPPLY:

Power supply shall be provided by distribution Sub feeder pillar to the Poles/ High Mast with Metering provision only. The Sub feeder pillar shall be suitable for outdoor application catering to IP54.

All the LT / HT cable shall be rated for 85°C operation with XLPE insulation. The cable network shall be so designed that voltage drop is within permissible limits.

The pole junction box shall be in built type which shall house MCB & looping strip. All MCB shall be rated for 10 KA of suitable current rating.

In accordance with the Indian Electricity rules (IER), the supply companies & undertakings are supposed to maintain (a) the voltage at consumer terminal $\pm 5\%$ of the declared LT voltage & $\pm 12.5\%$ of the declared HT voltage (b) the supply frequency at 50 Hz cycles & variation allowed is $\pm 1\%$. At 230 V, voltage drop should not be more than 5.6V. ($2\% \pm 1V$). For three phase loads/ industrial load, the voltage drop should not be more than 5%.

ENVIRONMENTAL MONITORING PLAN

| Sl.# | Environmental Issue | Description |
|------|---------------------|--|
| 1 | Ambient Air Quality | Installation Phase <ul style="list-style-type: none">• Ambient air quality monitoring for 24 hours twice in a week during summer, winter and post monsoon seasons near residential areas in each of the contract packages, where construction activities are undertaken for parameters like SPM, SO₂, NO_x, CO & HC. In the event of violation of 24 hourly average Indian standard for residential areas, construction activities should be restricted from 6 am to 6 pm. |
| 2 | Noise Quality | Installation Phase <ul style="list-style-type: none">• L_{eq day} and L_{eq night} to be monitored on monthly basis (other than for monsoon months) during construction phase near residential areas in each of the contract packages. In case of violations, construction activities are to be scheduled in such a way that the resultant noise levels are adhered to as per the standards. |
| 3 | Water Quality | Installation Phase <ul style="list-style-type: none">• Monitoring of at least 4 grab samples of surface water and 2 grab samples of groundwater for physical, chemical and biological parameters – once during each season including monsoon season. |
| 4 | Soil Quality | Installation Phase <ul style="list-style-type: none">• Monitoring of at least 1 grab sample of soil from each of the contract packages once during a season (other than monsoon season). The samples should be picked up from 60-70 m distance from centerline in the areas where construction activities are undertaken. The samples should be analyzed for heavy metals and oil & grease. |

To implement the EMP, an Environmental Management Cell (EMC) should be constituted before start of the Lighting work. EMC will undertake environmental monitoring and audits during construction and operation phases of the project and will check that environmental management measures are satisfactorily implemented with appropriate environmental performance. Specialized training should be imparted to construction Employers, Bidders, staff and workers for effective implementation of the suggested EMP.

TRAFFIC SAFETY AND CONTROL

1. Description

The Bidder shall solely be responsible for implementation of Traffic Management and Diversion during execution of awarded work as per IRC: SP:55-2014 “Guidelines on Traffic Management in Work Zones, other relevant IRC Codes, Clause 112 of Specifications for Road & Bridge Works (5th Revision) and as per details provided herein.

These specifications describe the traffic management and safety measures to be taken by the Bidder throughout the Lighting works period for ensuring the safe and convenient passage of public traffic through the project road on one hand and safety of the project workers on the other. It shall be understood that the Bidder is solely responsible for all the traffic management and safety measures which should be got approved by the Employer prior to taking up any Lighting work on the project.

Any Lighting work on or near a public travelLED way will pose a set of new situations, which may include diversion of road users on to unfamiliar paths, exposure of road users to moving construction equipment and workers, stacking of light fixtures/materials to cause reduction in the space available for public traffic, inadequate space for maneuvering, etc. which may pose several surprises. These may cause to develop hazardous situations in case adequate advance precautions in the form of notification, traffic etc. is not taken. Within the construction area itself, the workers may be handling materials like steel reinforcement/ Bar bending machine and moving road construction equipment which may prove to be a cause of serious accident if adequate precaution and safety measures are not taken. Thus, the guiding principles on which the Bidder shall base the traffic management and safety measures will include:

- i) advance warning of road users about the road situation including diversion ahead.
- ii) providing clear and safe demarcated channels for guiding the public traffic.
- iii) providing necessary traffic warning/ guiding devices such as signs, safety cones, pavement markings, red lights, reflecting studs/tapes, etc.
- iv) barricading construction area with CGI sheets so that public traffic steer clear of these and do not come into conflict with construction activities.
- v) providing the project workers with necessary safety gears such as gum boots, luminous yellow jackets, crash helmets etc. as appropriate.
- vi) taking all other necessary measures so that safety is ensured during all hours of day and night.

2. Traffic Management and Safety

Any construction activity on the project will pose a hazardous situation to the road users. For least disturbance to safe passage of public traffic appropriate traffic management and safety measures should be adopted throughout the construction period. In this regard, the construction zone in which conflict from safety angle may arise between the road users on one hand and the construction activities on the other shall be divided into 4 sub zones, and safety measures to be adopted therefore shall be as described hereunder:

a) Advance Warning Zone

This warning sub-zone is meant to inform, alert and prepare the approaching driver well in advance by providing information regarding the distance and extent/type of hazard ahead so that he is able to reduce the speed and be in readiness to carry out the necessary manoeuvres as he meets with the changed situation. For the operating speeds on the project road, length of this sub-zone shall be 100 mtr and 500 m, in plain and hilly terrain respectively. Information in this sub-zone will be conveyed through a series of traffic signs, which will include “Men at Work” and the speed reduction signs at the start and middle of this sub-zone.

b) Transition Sub-Zone

This sub-zone is the area in which the traffic is steered and guided into and out of the diverted path around the work sub-zone. This is the most crucial sub-zone from safety angle as vehicles have to be guided on to the diverted path, and most of the movements will be of turning type. The elements for designing this sub-zone are speed of the vehicles, extent of lateral shift and elevation difference between the normal and the diverted paths. The essential safety measures shall include delineation of the travel path and prevention of wayward movements of vehicles by means of barricades, channelizers, red cones, and red lamps during hours of darkness etc., as appropriate.

In the design of this sub-zone adequate attention shall be paid for providing necessary turning radius of the curves, grade to permit for safe passage of animal driven vehicles, drainage and dust-proofing. Where necessary traffic control shall be effected through manual flagging and by battery operated traffic lights during hours of darkness. Where vehicles have to wait, the waiting area shall be demarcated by stop lines.

Length of the sub-zone will generally be between 50 and 100 m.

c) Work Sub-Zone

This is to the area where construction activity takes place, and the main concern relates to safety of workers are also prevention of public traffic from entering the

work area. In this sub-zone, path of traffic shall be clearly delineated to avoid intrusion of public traffic moving on to the work area or construction equipment moving on to the public traffic. It shall be ensured that adequate distance is available between 2 consecutive work zones (2 Km. on urban section and 5-10 km. in rural sections) so that vehicles get sufficient breather space for overtaking slow vehicles, lane adjustment etc. Traffic across this sub-zone shall be guided through with the help of various traffic control devices, such as signs, delineation of travel path by cones/drums, barricades, luminous tapes etc. as appropriate.

d) Termination Sub-Zone

The sub-zone is intended to inform the road users of the end of the construction zone. This shall be effected through suitable informatory sign boards.

The standard on “Safety During Construction” may be referred for compliance.

3. Traffic Control Devices

Traffic control devices in the construction zones perform the crucial task of warning, informing and alerting drivers apart from guiding the vehicle movements so that the drivers of the vehicles as well as the workers on site are not faced with situations posing surprise/hazard, and safe passage to traffic is affected.

The primary traffic control devices used in work sub-zone are signs, delineators, barricades, cones, pylons, pavement marking, flashing lights etc. They shall be such that they are easily understood without any confusion, are clearly visible during day and night, conform to the prevailing speed in immediate vicinity, stable against sudden adverse weather conditions and are easy in installation, renewal and maintenance. Broad details of the different devices are hereunder:

a) Signs

The construction signs fall into 3 major categories namely, regulatory signs, warning signs and guide or informatory sign as defined and detailed in IRC:67-2012, Code of Practice for Road Signs (Third Revision). These signs shall be placed on the left hand side of the travel path.

The common Regulatory signs used in the construction zones are “No Entry”, “Road Closed”, “Speed Limit” etc. These shall be used in consultation with the local police and / or authorities.

The warning signs to alert the drivers of the possible danger ahead in the construction zones are “Lane Closed”, “Diversion to other carriageway”, “Divided carriageway Starts”, “Divided carriageway End”, “Two way Traffic” etc. It will be advisable to explain the signs with the help of a rectangular definition plate of

size of appropriate to the size of warning triangle and placed 0.15 m below, from the bottom of the triangle.

Guide signs in construction zones shall different background colour than the normal informatory signs of IRC:67-2012, These signs shall have black messages and arrows on yellow (Traffic Yellow of IS : 5-1978) background. The guide signs to be commonly used are “Diversion “Road Ahead Closed”, “Sharp Deviation of Rout” etc.

The commonly used temporary signs during construction are depicted in the drawings. These should preferably be of reflectorized type to be visible during hours of darkness.

b) Delineators

Delineators are channelizing devices such as cones, traffic cylinders, tapes, drums etc. which are placed in or adjacent to the roadway to guide the driver along a safe path and to control the flow of traffic. These shall normally be retro-reflectorized for night visibility. IRC: 79-2019 (Recommended Practice for Road Delineators – *First Revision*) gives details of some of the delineators. The types of delineators commonly used are traffic cones, drums and barricades.

c) Traffic Cones

Traffic cones shall normally be 0.5 m to 0.75 m high and 0.3 m to 0.4 m diameter or in square shape at the base. These shall be made of plastic or rubber with retro reflectorized red and white band and have suitable anchoring so that they are not easily blown over or displaced. The cones shall be placed close enough together (spacing 3-9m) to give an impression of the continuity. Larger sized cones shall be used for high speeds or where more conspicuous guidance is required.

d) Empty Metal / Bitumen / Emulsion Drums

Empty bitumen drums can be used as channelizing device since they are highly visible, give the appearance of being formidable objects, thereby commanding the respect of the drivers. These drums can also be of plastic which are lighter, easy to transport and store. As delineators, these drums shall be painted in circumferential strips 0.10 m to 0.15 wide, alternatively in black and white colours.

e) Barricades

When ever the traffic has to be restricted from entering the work areas such as excavations or material storage sites so that hazardous locations are barred for public and protection to workers is provided, or there is need for separation the two way traffic, barricades shall be used. The barricades may be of portable or fixed type and can be made of wooden planks, metal or other suitable material. The horizontal component facing the traffic shall be made of 0.30 m wide wooden planks joined together and painted in alternate yellow and white strips of 0.15 m

width and sloping down at an angle of 45° in the direction of traffic. Suitable support or ballasting shall be provided so that they do not over turn or are not blown away in strong winds. In case of fixed type barricades, a gate or moveable section shall be separately provided to allow the movement of the construction/supervision vehicles.

f) Flagmen

In large construction sites, flagmen with flags and sign paddles shall be effectively used to guide the safe movements. The flags for signaling shall be 0.60m x 0.60m size made of good red cloth and securely fastened to a staff of approximately 1 meter in length. The sign paddles shall conform to IRC:67-2012 and provided with a rigid handle.

For one-way operation at a time hours of darkness, battery operated red/green lights shall be used at either end of the affected section.

4. **Safety and Management Practices**

Measures for providing safe movement of traffic in some of the most commonly occurring work-zones on highways shall be as follows:

a) Detour on Temporary Diversion

In certain situations during the project construction period it may become necessary to pass the traffic on temporary diversion constructed parallel to highway.

A temporary diversion road shall basically satisfy the following requirements

- ❖ It shall have smooth horizontal and vertical profile for easy negotiation by vehicles.
- ❖ It shall not get overtopped by flood or drainage discharge under any circumstances.
- ❖ It shall have adequate capacity to cater for the diverted traffic
- ❖ It shall be dust free and shall ensure clear visibility at all times of the day and night. Pavement and riding surface for the diversion will depend on the duration over which the diversion will be used, and shall be as directed by the Employer.
- ❖ It shall be provided with the required safety standards and specifications.

The warning for the construction ahead shall be provided by the sign “Men at Work” about 1 Km. in advance of the work zone. In addition a supplementary plate indication “Diversion 1Km. Ahead” and a sign “Road closed Ahead” shall be placed. It shall be followed by “Compulsory Turn right/left sign”. The “Detour” and sharp deviation” sign shall be used to guide the traffic on to the diversion. Hazard markers shall be placed where the railings for the cross drainage structures on the diversion start.

b) Switch over of traffic from widened section and vice-versa

In the course of construction there may be situations in which the traffic passing through the full width road would have to pass on and merge with narrowed diverted section and vice-versa. For such cases, apart from “Men At Work” signs with distance plate in the advance warning zone, the signs indicating “Road Narrowing” or “Road widening” as appropriate shall be installed.

5. Precautions for Safety

The following general precautions shall apply to all the work sites.

a) General Measures

- i) All the sign and delineators shall be maintained in clean and brightly painted conditions at all times.
- ii) Adequate lighting arrangements shall be made for proper visibility during night travel through the work area.
- iii) Adequate arrangements for frequent sprinkling of water shall be made to keep the area dust free.

b) For Safety of Workmen

- i) Workmen shall be trained in use of tools and plant.
- ii) First –aids kits shall be provided
- iii) Workers required on site during night hours shall be provided with fluorescent jackets with reflective tapes.

c) For Safety of Road User

- i) As far as possible, the material, equipment and machinery shall be installed/parked in places sufficient away from the berms in the available road land. Only in avoidable cases the same is allowed near the edge of berms.
- ii) Machinery shall be parked at appropriate places away from the path of public traffic, and shall be provided with red flags and red lights.
- iii) Only minimum quantity of material required for the construction operations shall be collected at site near the public traveled way.

6. Safety Audit

Safety audit shall be conducted periodically on the safety measures adopted during the constructions operations. The main aspects to be covered shall include:

- a) Machinery
- b) Temporary works
- c) Equipment & Vehicles
- d) Material storage and handling
- e) Construction procedures

- f) Environment
- g) Site safety guidelines
- h) Miscellaneous services

The Bidder shall constitute special teams from his staff for the above audit, and shall take appropriate corrective measures to the directions of the Employer.

ANNEXURE A:

LIST OF LOCATIONS FOR LIGHTING WORKS

Annexure A- Lighting Locations in Jharkhand Section

| 1. Structure Lighting Scope | | | | | | |
|---------------------------------|-------------------|----------|--------|------------|------|-------------------------------|
| SI no | TYPE OF Structure | Chainage | | Length (m) | Side | Remarks |
| | | From | To | | | |
| 1 | PUP | 398270 | 399500 | 1230 | BHS | |
| 2 | GS | | | | | |
| 3 | PUP | | | | | |
| 4 | VUP | 403180 | 403870 | 690 | BHS | |
| 5 | VUP | 411020 | 411700 | 680 | BHS | |
| 6 | VUP | 413615 | 414340 | 725 | BHS | |
| 7 | PUP | 417810 | 418160 | 350 | BHS | |
| 8 | VUP | 421120 | 421635 | 515 | BHS | |
| 9 | PUP | 424350 | 424750 | 400 | BHS | |
| 10 | VUP | 433100 | 433900 | 800 | BHS | |
| 11 | OP | 437200 | 438100 | 900 | BHS | |
| 12 | Toll Plaza | 438100 | 438800 | 700 | BHS | |
| 2. Truck Lay Bye Lighting Scope | | | | | | |
| SI no | TYPE OF Structure | Chainage | | Length (m) | Side | Remarks |
| | | From | To | | | |
| 1 | TLB | 400750 | 401050 | 300 | LHS | Extra Taper length 105m +70 m |
| 2 | TLB | 402250 | 402350 | 100 | LHS | |
| 3 | TLB | 405950 | 406100 | 150 | LHS | |
| 4 | TLB | 413200 | 413300 | 100 | RHS | |
| 5 | TLB | 431200 | 431300 | 100 | LHS | |
| 3. Bus Laybye Lighting Scope | | | | | | |
| SI no | Structure | Chainage | | Length (m) | Side | Remarks |
| | | From | To | | | |
| 1 | BLB | 399350 | 399395 | 45 | LHS | Extra Taper length 105m +70 m |
| 2 | BLB | 398400 | 398445 | 45 | RHS | |
| 3 | BLB | 409050 | 409095 | 45 | LHS | |
| 4 | BLB | 408800 | 408845 | 45 | RHS | |
| 5 | BLB | 411500 | 411545 | 45 | LHS | |
| 6 | BLB | 411250 | 411295 | 45 | RHS | |
| 7 | BLB | 414200 | 414245 | 45 | LHS | |
| 8 | BLB | 414300 | 414345 | 45 | RHS | |
| 9 | BLB | 428350 | 428395 | 45 | LHS | |
| 10 | BLB | 428500 | 428545 | 45 | RHS | |

| 4. Truck Parking Lighting Scope | | | | | | |
|---------------------------------|-------------------|----------|--------|------------|------|---------|
| SI no | TYPE OF Structure | Chainage | | Length (m) | Side | Remarks |
| | | From | To | | | |
| 1 | TP | 401500 | 402000 | 500 | LHS | |

| 5. High Mast Lighting Scope | | | | | | |
|-----------------------------|-------------------|----------|--------|---------|------|---------|
| SI no | TYPE OF Structure | Chainage | | No | Side | Remarks |
| | | From | To | | | |
| 1 | Truck Parking | 401500 | 402000 | 03 No's | | |

| 6. De-scope Four Lane retained section Lighting Scope | | | | | | |
|---|--------------------|----------|--------|------------|------|----------------------|
| SI no | TYPE OF Structure | Chainage | | Length (m) | Side | Remarks |
| | | From | To | | | |
| 1 | Four lane at grade | 406850 | 409680 | 2830 | BHS | Separator area light |
| 2 | | 427100 | 430000 | 2900 | BHS | |

| 7. Built up section Lighting Scope | | | | | | |
|------------------------------------|-------------------|----------|--------|------------|------|---------|
| SI no | TYPE OF Structure | Chainage | | Length (m) | Side | Remarks |
| | | From | To | | | |
| 1 | Built up section | 404100 | 405150 | 1050 | BHS | |
| 2 | Built up section | 414340 | 414750 | 410 | BHS | |
| 3 | Built up section | 415350 | 415600 | 250 | BHS | |
| 4 | Built up section | 418200 | 418700 | 500 | BHS | |
| 5 | Built up section | 421635 | 422200 | 565 | BHS | |
| 6 | Built up section | 430650 | 431550 | 900 | BHS | |
| 7 | Built up section | 433900 | 434200 | 300 | BHS | |

ANNEXURE – B

**TYPICAL CROSS-SECTIONAL DESIGN WITH
SCHEDULE**

1/12/2024

| SR.NO | APPLICABLE LOCATIONS | | LENGTH (M) | TCS - TYPE | DESCRIPTION OF TCS |
|-------|----------------------|--------|------------|----------------|---|
| | FROM | TO | | | |
| 1 | 398240 | 398320 | 80 | TCS-3AA (R/C) | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE RECONSTRUCTION AND WITH LEFT SIDE SERVICE ROAD (BUILT-UP SECTION) |
| 2 | 398320 | 398510 | 190 | TCS-9AA | 6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (BUILT-UP SECTION) |
| 3 | 398510 | 398680 | 170 | TCS-9CC | 6-LANE DIVIDED HIGHWAY WITH LOP SIDED APPROACHES (RHS GREATER THAN LHS) OF FLYOVER / GRADE SEPARATOR / UNDERPASS (BUILT-UP SECTION) |
| 4 | 398680 | 399000 | 320 | TCS-13AA (R/C) | 6-LANE DIVIDED HIGHWAY WITH RIGHT SIDE (UNI DIRECTIONAL) GRADE SEPARATOR APPROACH WITH BOTH SIDE SERVICE ROAD (BUILT-UP SECTION) |
| 5 | 399000 | 399100 | 100 | TCS-9CC | 6-LANE DIVIDED HIGHWAY WITH LOP SIDED APPROACHES (RHS GREATER THAN LHS) OF FLYOVER / GRADE SEPARATOR / UNDERPASS (BUILT-UP SECTION) |
| 6 | 399100 | 399140 | 40 | TCS-9FF | 6-LANE DIVIDED HIGHWAY WITH LOP SIDED APPROACHES (RHS GREATER THAN LHS) OF FLYOVER / GRADE SEPARATOR / UNDERPASS (OPEN COUNTRY) |
| 7 | 399140 | 399480 | 340 | TCS-9BB | 6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (OPEN COUNTRY) |
| 8 | 399480 | 400750 | 1270 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 9 | 400750 | 401050 | 300 | TCS-6B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 10 | 401050 | 401500 | 450 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 11 | 401500 | 401600 | 100 | TCS-4B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH RIGHT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 12 | 401600 | 402050 | 450 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 13 | 402050 | 402080 | 30 | TCS-3B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH LEFT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 14 | 402080 | 402250 | 170 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 15 | 402250 | 402350 | 100 | TCS-6B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD & LEFT SIDE TRUCK LAYBY (OPEN COUNTRY) |
| 16 | 402350 | 403120 | 770 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 17 | 403120 | 403740 | 620 | TCS-9BB | 6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (OPEN COUNTRY) |
| 18 | 403740 | 404100 | 360 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 19 | 404100 | 405000 | 900 | TCS-2AA | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH RIGHT SIDE SERVICE ROAD (BUILT-UP SECTION) |
| 20 | 405000 | 405050 | 50 | TCS-4AA | 6-LANE DIVIDED HIGHWAY WITH LOP SIDED APPROACHES OF NEW BRIDGE ON LEFT SIDE AND RETAINING EXISTING (2+2 LANE) BRIDGES ON RIGHT SIDE |
| 21 | 405050 | 405580 | 530 | TCS-15 | 6-LANE DIVIDED HIGHWAY WITH APPROACHES OF NEW BRIDGE ON LEFT SIDE AND RETAINING EXISTING (2+2 LANE) BRIDGES ON RIGHT SIDE |
| 22 | 405580 | 405700 | 120 | TCS-4B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH RIGHT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 23 | 405700 | 406000 | 300 | TCS-C1 | TYPICAL CROSS SECTION WITH BOTH SIDE WIDENING & WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 24 | 406000 | 406530 | 530 | TCS-C1 | TYPICAL CROSS SECTION WITH BOTH SIDE WIDENING & WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 25 | 406530 | 407100 | 570 | TCS-32 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (BUILT-UP SECTION) |
| 26 | 407100 | 409070 | 1970 | TCS-32A | CROSS SECTION AT GRADE SEPARATOR / VUP & PUP APPROACHES |
| 27 | 409070 | 409250 | 180 | TCS-32B | 6-LANE DIVIDED HIGHWAY WITH LOP SIDED APPROACHES (LHS GREATER THAN RHS) OF FLYOVER / GRADE SEPARATOR / UNDERPASS (BUILT-UP SECTION) |
| 28 | 409250 | 409840 | 590 | TCS-32C | 6-LANE DIVIDED HIGHWAY WITH LEFT SIDE (UNI DIRECTIONAL) GRADE SEPARATOR APPROACH WITH LEFT SIDE SERVICE ROAD (BUILT-UP SECTION) |
| 29 | 409840 | 410100 | 260 | TCS-15A | 6-LANE DIVIDED HIGHWAY WITH APPROACHES OF NEW BRIDGE ON LEFT SIDE AND RETAINING EXISTING (2+2 LANE) BRIDGES ON RIGHT SIDE WITH SERVICE ROAD LEFT SIDE |
| 30 | 410100 | 410550 | 450 | TCS-B1 | TYPICAL CROSS SECTION FOR WITH BOTH SIDE WIDENING & WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 31 | 410550 | 411040 | 490 | TCS-C1 | TYPICAL CROSS SECTION FOR WITH BOTH SIDE WIDENING & WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 32 | 411040 | 411680 | 640 | TCS-9B2 | 6-LANE DIVIDED HIGHWAY WITH VEHICULAR & PEDESTRIAN UNERPASS APPROACHES (OPEN COUNTRY) |
| 33 | 411680 | 413200 | 1520 | TCS-C1 | TYPICAL CROSS SECTION FOR WITH BOTH SIDE WIDENING & WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 34 | 413200 | 413300 | 100 | TCS-F | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD & RIGHT SIDE TRUCK LAYBY (OPEN COUNTRY) |
| 35 | 413300 | 413620 | 320 | TCS-C1 | TYPICAL CROSS SECTION FOR WITH BOTH SIDE WIDENING & WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 36 | 413620 | 414100 | 480 | TCS-9B2 | 6-LANE DIVIDED HIGHWAY WITH VEHICULAR & PEDESTRIAN UNERPASS APPROACHES (OPEN COUNTRY) |
| 37 | 414100 | 414300 | 200 | TCS-9A2 | 6-LANE DIVIDED HIGHWAY WITH VEHICULAR & PEDESTRIAN UNERPASS APPROACHES (BUILT-UP SECTION) |
| 38 | 414300 | 414700 | 400 | TCS-C | TYPICAL CROSS SECTION FOR WITH BOTH SIDE WIDENING & WITH BOTH SIDE SERVICE ROAD (BUILT-UP SECTION) |
| 39 | 414700 | 414750 | 50 | TCS-4AA | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH RIGHT SIDE SERVICE ROAD (BUILT-UP SECTION) |
| 40 | 414750 | 415350 | 600 | TCS-15A | 6-LANE DIVIDED HIGHWAY WITH APPROACHES OF NEW BRIDGE ON LEFT SIDE AND RETAINING EXISTING (2+2 LANE) BRIDGES ON RIGHT SIDE |
| 41 | 415350 | 415550 | 200 | TCS-4AA | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH RIGHT SIDE SERVICE ROAD (BUILT-UP SECTION) |
| 42 | 415550 | 416300 | 750 | TCS-3B1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH LEFT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 43 | 416300 | 416650 | 350 | TCS-C1 | TYPICAL CROSS SECTION FOR WITH BOTH SIDE WIDENING & WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 44 | 416650 | 417250 | 600 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 45 | 417250 | 417380 | 130 | TCS-4B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH RIGHT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 46 | 417380 | 417820 | 440 | TCS-C1 | TYPICAL CROSS SECTION FOR WITH BOTH SIDE WIDENING & WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 47 | 417820 | 418200 | 380 | TCS-9B2 | 6-LANE DIVIDED HIGHWAY WITH VEHICULAR & PEDESTRIAN UNERPASS APPROACHES (OPEN COUNTRY) |
| 48 | 418200 | 418700 | 500 | TCS-C | TYPICAL CROSS SECTION FOR WITH BOTH SIDE WIDENING & WITH BOTH SIDE SERVICE ROAD (BUILT-UP SECTION) |
| 49 | 418700 | 419900 | 1200 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 50 | 419900 | 420150 | 250 | TCS-14 | 4-LANE DIVIDED HIGHWAY - RETAINING EXISTING CARRIAGEWAY CONFIGURATION |
| 51 | 420150 | 420250 | 100 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 52 | 420250 | 421070 | 820 | TCS-C1 | TYPICAL CROSS SECTION FOR WITH BOTH SIDE WIDENING & WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 53 | 421070 | 421400 | 330 | TCS-9B2 | 6-LANE DIVIDED HIGHWAY WITH VEHICULAR & PEDESTRIAN UNERPASS APPROACHES (OPEN COUNTRY) |
| 54 | 421400 | 421710 | 310 | TCS-9A2 | 6-LANE DIVIDED HIGHWAY WITH VEHICULAR & PEDESTRIAN UNERPASS APPROACHES (BUILT-UP SECTION) |
| 55 | 421710 | 422200 | 490 | TCS-C | TYPICAL CROSS SECTION FOR WITH BOTH SIDE WIDENING & WITH BOTH SIDE SERVICE ROAD (BUILT-UP SECTION) |
| 56 | 422200 | 422250 | 50 | TCS-4B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH RIGHT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 57 | 422250 | 424200 | 1950 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 58 | 424200 | 424250 | 50 | TCS-C1 | TYPICAL CROSS SECTION FOR WITH BOTH SIDE WIDENING & WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 59 | 424250 | 424730 | 480 | TCS-9B2 | 6-LANE DIVIDED HIGHWAY WITH VEHICULAR & PEDESTRIAN UNERPASS APPROACHES (OPEN COUNTRY) |

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REVIEWED

Under review

| SR.NO | APPLICABLE LOCATIONS | | LENGTH (M) | TCS - TYPE | DESCRIPTION OF TCS |
|-------|----------------------|----------|------------|------------|--|
| | FROM | TO | | | |
| 60 | 424730 | 424800 | 70 | TCS-C1 | TYPICAL CROSS SECTION FOR WITH BOTH SIDE WIDENING & WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 61 | 424800 | 424950 | 150 | TCS-4B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH RIGHT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 62 | 424950 | 425590 | 640 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 63 | 425590 | 425640 | 50 | TCS-3B1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH LEFT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 64 | 425640 | 426100 | 460 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 65 | 426100 | 426110 | 10 | TCS-4B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH RIGHT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 66 | 426110 | 426250 | 140 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 67 | 426250 | 426260 | 10 | TCS-3B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH LEFT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 68 | 426260 | 426850 | 590 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 69 | 426850 | 426900 | 50 | TCS-32 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH RIGHT SIDE SERVICE ROAD |
| 70 | 426900 | 427100 | 200 | TCS-32 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD |
| 71 | 427100 | 427800 | 700 | TCS-32 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (BUILT-UP SECTION) |
| 72 | 427800 | 428630 | 830 | TCS-32A | CROSS SECTION AT GRADE SEPARATOR / VJP & PUP APPROACHES |
| 73 | 428630 | 429300 | 670 | TCS-32 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (BUILT-UP SECTION) |
| 74 | 429300 | 429700 | 400 | TCS-32 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH RIGHT SIDE SERVICE ROAD (BUILT-UP SECTION) |
| 75 | 429700 | 429850 | 150 | TCS-32 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH RIGHT SIDE SERVICE ROAD |
| 76 | 429850 | 430010 | 160 | TCS-15 | 6-LANE DIVIDED HIGHWAY WITH APPROACHES OF NEW BRIDGE ON LEFT SIDE AND RETAINING EXISTING (2+2 LANE) BRIDGES ON RIGHT SIDE |
| 77 | 430010 | 430150 | 140 | TCS-15 | 6-LANE DIVIDED HIGHWAY WITH APPROACHES OF NEW BRIDGE ON LEFT SIDE AND RETAINING EXISTING (2+2 LANE) BRIDGES ON RIGHT SIDE |
| 78 | 430150 | 430290 | 140 | TCS-4B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH RIGHT SIDE SERVICE ROAD (Median width 0.51 m) |
| 79 | 430290 | 430650 | 360 | TCS-C1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING & WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 80 | 430650 | 431200 | 550 | TCS-C | TYPICAL CROSS SECTION FOR WITH BOTH SIDE WIDENING & WITH BOTH SIDE SERVICE ROAD (BUILT-UP SECTION) |
| 81 | 431200 | 431300 | 100 | TCS-E1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (BUILT-UP SECTION) |
| 82 | 431300 | 431550 | 250 | TCS-C | TYPICAL CROSS SECTION FOR WITH BOTH SIDE WIDENING & WITH BOTH SIDE SERVICE ROAD & LEFT SIDE TRUCK LAYBY (BUILT-UP SECTION) |
| 83 | 431550 | 432030 | 480 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 84 | 432030 | 432390 | 360 | TCS-3B1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 85 | 432390 | 433000 | 610 | TCS-C1 | TYPICAL CROSS SECTION FOR WITH BOTH SIDE WIDENING & WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 86 | 433000 | 433450 | 450 | TCS-9A2 | 6-LANE DIVIDED HIGHWAY WITH VEHICULAR & PEDESTRIAN UNERPASS APPROACHES (BUILT-UP SECTION) |
| 87 | 433450 | 433900 | 450 | TCS-9B2 | 6-LANE DIVIDED HIGHWAY WITH VEHICULAR & PEDESTRIAN UNERPASS APPROACHES (OPEN COUNTRY) |
| 88 | 433900 | 434200 | 300 | TCS-C | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING & WITH BOTH SIDE SERVICE ROAD (BUILT-UP SECTION) |
| 89 | 434200 | 434400 | 200 | TCS-C1 | TYPICAL CROSS SECTION FOR WITH BOTH SIDE WIDENING & WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 90 | 434400 | 434500 | 100 | TCS-3B1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH LEFT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 91 | 434500 | 435100 | 600 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 92 | 435100 | 435475 | 375 | TCS-4B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH RIGHT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 93 | 435475 | 436100 | 625 | TCS-C1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING & WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 94 | 436100 | 436400 | 300 | TCS-4B | TYPICAL CROSS SECTION FOR WITH BOTH SIDE WIDENING AND WITH,RIGHT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 95 | 436400 | 436690 | 290 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 96 | 436690 | 436720 | 30 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 97 | 436720 | 436770 | 50 | TCS-4B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 98 | 436770 | 437200 | 430 | TCS-15 | 6-LANE DIVIDED HIGHWAY WITH APPROACHES OF NEW BRIDGE ON LEFT SIDE AND RETAINING EXISTING (2+2 LANE) BRIDGES ON RIGHT SIDE |
| 99 | 437200 | 437300 | 100 | TCS-4B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH RIGHT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 100 | 437300 | 438100 | 800 | TCS-18 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH RIGHT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 101 | 438100 | 438220 | 120 | TCS-18 | 6-LANE DIVIDED HIGHWAY WITH OVERPASS AND WITH BOTH SIDE SERVICE ROADS |
| 102 | 438220 | 438487.5 | 268 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 103 | 438487.5 | 438912.5 | 425 | TOLL PLAZA | (TOLL PLAZA) |
| 104 | 438912.5 | 439000 | 88 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 105 | 439000 | 439160 | 160 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 106 | 439160 | 439400 | 240 | TCS-3B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH LEFT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 107 | 439400 | 439670 | 270 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 108 | 439670 | 439720 | 50 | TCS-4B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH RIGHT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 109 | 439720 | 440300 | 580 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 110 | 440300 | 441565 | 1265 | TCS-14 | 4-LANE DIVIDED HIGHWAY - RETAINING EXISTING CARRIAGEWAY CONFIGURATION |
| 111 | 441565 | 441740 | 175 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 112 | 441740 | 441790 | 50 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 113 | 441790 | 441990 | 200 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 114 | 441990 | 442210 | 220 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 115 | 442210 | 442410 | 200 | TCS-11B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH RIGHT SIDE TRUCK LAYBY (OPEN COUNTRY) |
| 116 | 442410 | 442550 | 140 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 117 | 442550 | 442750 | 200 | TCS-11A | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH LEFT SIDE TRUCK LAYBY (OPEN COUNTRY) |
| 118 | 442750 | 442950 | 200 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |

APPROVED

GOOD FOR CONSTRUCTION



Under review
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| SR.NO | APPLICABLE LOCATIONS | | LENGTH (M) | TCS - TYPE | DESCRIPTION OF TCS |
|-------|----------------------|--------|------------|------------|--|
| | FROM | TO | | | |
| 119 | 442950 | 443200 | 250 | TCS-3B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH LEFT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 120 | 443200 | 443710 | 510 | TCS-9BB | 6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (OPEN COUNTRY) |
| 121 | 443710 | 444200 | 490 | TCS-9BB | 6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (OPEN COUNTRY) |
| 122 | 444200 | 445075 | 875 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 123 | 445075 | 445125 | 50 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 124 | 445125 | 445250 | 125 | TCS-3B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH LEFT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 125 | 445250 | 445950 | 700 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 126 | 445950 | 446040 | 90 | TCS-3B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH LEFT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 127 | 446040 | 446125 | 85 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 128 | 446125 | 447140 | 1015 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 129 | 447140 | 447420 | 280 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 130 | 447420 | 448300 | 880 | TCS-9BB | 6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (OPEN COUNTRY) |
| 131 | 448300 | 448460 | 160 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 132 | 448460 | 449100 | 640 | TCS-14 | 4-LANE DIVIDED HIGHWAY - RETAINING EXISTING CARRIAGEWAY CONFIGURATION |
| 133 | 449100 | 449365 | 265 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 134 | 449365 | 449415 | 50 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 135 | 449415 | 449800 | 385 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 136 | 449800 | 449900 | 100 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 137 | 449900 | 450420 | 520 | TCS-15 | 6-LANE DIVIDED HIGHWAY WITH APPROACHES OF NEW BRIDGE ON LEFT SIDE AND RETAINING EXISTING (2+2 LANE) BRIDGES ON RIGHT SIDE |
| 138 | 450420 | 450550 | 130 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 139 | 450550 | 450680 | 130 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 140 | 450680 | 451480 | 800 | TCS-9BB | 6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (OPEN COUNTRY) |
| 141 | 451480 | 452150 | 670 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 142 | 452150 | 452200 | 50 | TCS-4B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH RIGHT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 143 | 452200 | 452850 | 650 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 144 | 452850 | 452870 | 20 | TCS-3B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH LEFT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 145 | 452870 | 452920 | 50 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH LEFT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 146 | 452920 | 453610 | 690 | TCS-3B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH LEFT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 147 | 453610 | 453800 | 190 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 148 | 453800 | 454700 | 900 | TCS-14 | 4-LANE DIVIDED HIGHWAY - RETAINING EXISTING CARRIAGEWAY CONFIGURATION |
| 149 | 454700 | 455000 | 300 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 150 | 455000 | 455115 | 115 | TCS-4B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH RIGHT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 151 | 455115 | 455165 | 50 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 152 | 455165 | 455700 | 535 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 153 | 455700 | 455800 | 100 | TCS-4B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH RIGHT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 154 | 455800 | 455940 | 140 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 155 | 455940 | 456700 | 760 | TCS-9BB | 6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (OPEN COUNTRY) |
| 156 | 456700 | 457100 | 400 | TCS-4B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH RIGHT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 157 | 457100 | 457950 | 850 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 158 | 457950 | 458470 | 520 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 159 | 458470 | 458850 | 380 | TCS-3B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH LEFT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 160 | 458850 | 459740 | 890 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 161 | 459740 | 460480 | 740 | TCS-9BB | 6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (OPEN COUNTRY) |
| 162 | 460480 | 460750 | 270 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 163 | 460750 | 461365 | 615 | TCS-4B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH RIGHT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 164 | 461365 | 461420 | 55 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 165 | 461420 | 461500 | 80 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 166 | 461500 | 461870 | 370 | TCS-15 | 6-LANE DIVIDED HIGHWAY WITH APPROACHES OF NEW BRIDGE ON LEFT SIDE AND RETAINING EXISTING (2+2 LANE) BRIDGES ON RIGHT SIDE |
| 167 | 461870 | 462080 | 210 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 168 | 462080 | 462130 | 50 | TCS-4B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH RIGHT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 169 | 462130 | 463165 | 1035 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 170 | 463165 | 463190 | 25 | TCS-3B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH LEFT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 171 | 463190 | 463310 | 120 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 172 | 463310 | 463425 | 115 | TCS-3B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH LEFT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 173 | 463425 | 463750 | 325 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 174 | 463750 | 464500 | 750 | TCS-13BB | 6-LANE DIVIDED HIGHWAY WITH RIGHT SIDE (UNI DIRECTIONAL) GRADE SEPARATOR APPROACH WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 175 | 464500 | 465010 | 510 | TCS-16 | 6-LANE DIVIDED HIGHWAY WITH APPROACHES OF NEW BRIDGE ON RIGHT SIDE AND RETAINING EXISTING (2+2 LANE) BRIDGES ON LEFT SIDE |
| 176 | 465010 | 465730 | 720 | TCS-3B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH LEFT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 177 | 465730 | 466800 | 1070 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |

APPROVED

GOOD FOR CONSTRUCTION



M. Srinivas Reddy
REVIEWED

| SR.NO | APPLICABLE LOCATIONS | | LENGTH (M) | TCS - TYPE | DESCRIPTION OF TCS |
|-------|----------------------|--------|------------|------------|---|
| | FROM | TO | | | |
| 178 | 466800 | 467300 | 500 | TCS-9BB | 6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (OPEN COUNTRY) |
| 179 | 467300 | 467620 | 320 | TCS-9AA | 6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (BUILT-UP SECTION) |
| 180 | 468200 | 468200 | 580 | TCS-2AA | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (BUILT-UP SECTION) |
| 181 | 468200 | 468320 | 120 | TCS-3AA | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH LEFT SIDE SERVICE ROAD (BUILT-UP SECTION) |
| 182 | 468320 | 468400 | 80 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 183 | 468400 | 468900 | 500 | TCS-15 | 6-LANE DIVIDED HIGHWAY WITH APPROACHES OF NEW BRIDGE ON LEFT SIDE AND RETAINING EXISTING (2+2 LANE) BRIDGES ON RIGHT SIDE |
| 184 | 468900 | 469000 | 100 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 185 | 469000 | 469530 | 530 | TCS-22A | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (BUILT-UP SECTION) |
| 186 | 469530 | 470000 | 470 | TCS-22B | 6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (BUILT-UP SECTION) |
| 187 | 470000 | 470170 | 170 | TCS-22B | 6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (Open Country) |
| 188 | 470170 | 470250 | 80 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 189 | 470250 | 470700 | 450 | TCS-3B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH LEFT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 190 | 470700 | 471150 | 450 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 191 | 471150 | 471390 | 240 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 192 | 471390 | 472200 | 810 | TCS-3B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH LEFT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 193 | 472200 | 472500 | 300 | TCS-3AA | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH LEFT SIDE SERVICE ROAD (BUILT-UP SECTION) |
| 194 | 472500 | 472980 | 480 | TCS-2AA | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (BUILT-UP SECTION) |
| 195 | 472980 | 473700 | 720 | TCS-9AA | 6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (BUILT-UP SECTION) |
| 196 | 473700 | 475300 | 1600 | TCS-2AA | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (BUILT-UP SECTION) |
| 197 | 475300 | 475620 | 320 | TCS-9AA | 6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (BUILT-UP SECTION) |
| 198 | 475620 | 476000 | 380 | TCS-9DD | 6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (BUILT-UP SECTION) |
| 199 | 476000 | 476120 | 120 | TCS-12AA | 6-LANE DIVIDED HIGHWAY WITH LOP SIDED APPROACHES (LHS GREATER THAN RHS) OF FLYOVER / GRADE SEPARATOR / UNDERPASS (BUILT-UP SECTION) |
| 200 | 476120 | 476640 | 520 | TCS-9DD | 6-LANE DIVIDED HIGHWAY WITH LOP SIDED APPROACHES (LHS GREATER THAN RHS) OF FLYOVER / GRADE SEPARATOR / UNDERPASS (BUILT-UP SECTION) |
| 201 | 476640 | 476950 | 310 | TCS-2AA | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH LEFT SIDE SERVICE ROAD (BUILT-UP SECTION) |
| 202 | 476950 | 477000 | 50 | TCS-3AA | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 203 | 477000 | 477300 | 300 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 204 | 477300 | 477600 | 300 | TCS-11A | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH LEFT SIDE TRUCK LAYBY (OPEN COUNTRY) |
| 205 | 477600 | 477880 | 280 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 206 | 477880 | 478770 | 890 | TCS-3B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH LEFT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 207 | 478770 | 479480 | 710 | TCS-9BB | 6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (OPEN COUNTRY) |
| 208 | 479480 | 479700 | 220 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH LEFT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 209 | 479700 | 480600 | 900 | TCS-4B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 210 | 480600 | 480670 | 70 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH RIGHT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 211 | 480670 | 480690 | 20 | TCS-4B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 212 | 480690 | 480800 | 110 | TCS-14 | 4-LANE DIVIDED HIGHWAY - RETAINING EXISTING CARRIAGEWAY CONFIGURATION |
| 213 | 480800 | 482380 | 1580 | TCS-14 | 4-LANE DIVIDED HIGHWAY - RETAINING EXISTING CARRIAGEWAY CONFIGURATION |
| 214 | 482380 | 482430 | 50 | TCS-14 | 4-LANE DIVIDED HIGHWAY - RETAINING EXISTING CARRIAGEWAY CONFIGURATION + RHS SR |
| 215 | 482430 | 483850 | 1420 | TCS-14 | 4-LANE DIVIDED HIGHWAY - RETAINING EXISTING CARRIAGEWAY CONFIGURATION |
| 216 | 483850 | 483950 | 100 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 217 | 483950 | 484000 | 50 | TCS-3B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH LEFT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 218 | 484000 | 484050 | 50 | TCS-4B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH RIGHT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 219 | 484050 | 485400 | 1350 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 220 | 485400 | 485550 | 150 | TCS-3B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH LEFT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 221 | 485550 | 485860 | 310 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 222 | 485860 | 486700 | 840 | TCS-9AA | 6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (BUILT-UP SECTION) |
| 223 | 486700 | 486920 | 220 | TCS-9BB | 6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (OPEN COUNTRY) |
| 224 | 486920 | 487100 | 180 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 225 | 487100 | 487850 | 750 | TCS-3B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH LEFT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 226 | 487850 | 487930 | 80 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 227 | 487930 | 488550 | 620 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 228 | 488550 | 489340 | 790 | TCS-2AA | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (BUILT-UP SECTION) |
| 229 | 489340 | 490140 | 800 | TCS-9AA | 6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (BUILT-UP SECTION) |
| 230 | 490140 | 490300 | 160 | TCS-2AA | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (BUILT-UP SECTION) |
| 231 | 490300 | 490400 | 100 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 232 | 490400 | 490600 | 200 | TCS-6B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD & LEFT SIDE TRUCK LAYBY (OPEN COUNTRY) |
| 233 | 490600 | 491000 | 400 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 234 | 491000 | 491100 | 100 | TCS-2AA | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 235 | 491100 | 491820 | 720 | TCS-9AA | 6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (BUILT-UP SECTION) |
| 236 | 491820 | 491980 | 160 | TCS-2AA | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (BUILT-UP SECTION) |

APPROVED

GOOD FOR CONSTRUCTION



REVIEWED


| SR.NO | APPLICABLE LOCATIONS | | LENGTH (M) | TCS - TYPE | DESCRIPTION OF TCS |
|-------|----------------------|--------|------------|---------------|--|
| | FROM | TO | | | |
| 237 | 491980 | 492180 | 200 | TCS-6AA | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD & LEFT SIDE TRUCK LAYBY (BUILT-UP SECTION) |
| 238 | 492180 | 492600 | 420 | TCS-2AA | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (BUILT-UP SECTION) |
| 239 | 492600 | 492690 | 90 | TCS-3AA | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH LEFT SIDE SERVICE ROAD (BUILT-UP SECTION) |
| 240 | 492690 | 493000 | 310 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 241 | 493000 | 493170 | 170 | TCS-3AA | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH LEFT SIDE SERVICE ROAD (BUILT-UP SECTION) |
| 242 | 493170 | 493960 | 790 | TCS-2AA | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (BUILT-UP SECTION) |
| 243 | 493960 | 494760 | 800 | TCS-9AA | 6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (BUILT-UP SECTION) |
| 244 | 494760 | 495300 | 540 | TCS-2AA | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (BUILT-UP SECTION) |
| 245 | 495300 | 495340 | 40 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 246 | 495340 | 495500 | 160 | TCS-3B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH LEFT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 247 | 495500 | 495800 | 300 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 248 | 495800 | 495900 | 100 | TCS-3B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH LEFT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 249 | 495900 | 496180 | 280 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 250 | 496180 | 497060 | 880 | TCS-9BB | 6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (OPEN COUNTRY) |
| 251 | 497060 | 497520 | 460 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 252 | 497520 | 497760 | 240 | TCS-4B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH RIGHT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 253 | 497760 | 498075 | 315 | TCS-15 | 6-LANE DIVIDED HIGHWAY WITH APPROACHES OF NEW BRIDGE ON LEFT SIDE AND RETAINING EXISTING (2+2 LANE) BRIDGES ON RIGHT SIDE |
| 254 | 498075 | 498180 | 105 | TCS-4B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH RIGHT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 255 | 498180 | 498500 | 320 | TCS-4B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH RIGHT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 256 | 498500 | 499020 | 520 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 257 | 499020 | 499860 | 840 | TCS-18 | 6-LANE DIVIDED HIGHWAY WITH OVERPASS AND WITH BOTH SIDE SERVICE ROADS |
| 258 | 499860 | 499940 | 80 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 259 | 499940 | 500400 | 460 | TCS-17A | 6-LANE DIVIDED HIGHWAY WITH UNDERPASS APPROACHES AND WITH LEFT SIDE WIDENING |
| 260 | 500400 | 500620 | 220 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 261 | 500620 | 500750 | 130 | TCS-3B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH LEFT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 262 | 500750 | 500950 | 200 | TCS-6B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD & LEFT SIDE TRUCK LAYBY (OPEN COUNTRY) |
| 263 | 500950 | 501250 | 300 | TCS-3B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH LEFT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 264 | 501250 | 501540 | 290 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 265 | 501540 | 502500 | 960 | TCS-9BB | 6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (OPEN COUNTRY) |
| 266 | 502500 | 502520 | 20 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 267 | 502520 | 502700 | 180 | TCS-4B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH RIGHT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 268 | 502700 | 503600 | 900 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 269 | 503600 | 503730 | 130 | TCS-4B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH RIGHT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 270 | 503730 | 503985 | 255 | TCS-4B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH RIGHT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 271 | 503985 | 504030 | 45 | TCS-23A | 6-LANE DIVIDED HIGHWAY WITH UNDERPASS APPROACHES, WITH RIGHT SIDE WIDENING AND WITH BOTH SIDE SERVICE ROADS (With RE Wall) |
| 272 | 504030 | 504260 | 230-170 | TCS-13BB | 6-LANE DIVIDED HIGHWAY WITH RIGHT SIDE (UNI DIRECTIOAL) GRADE SEPARATOR APPROACH WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 273 | 504260 | 504350 | 90-150 | TCS-13BB-13AA | 6-LANE DIVIDED HIGHWAY WITH RIGHT SIDE (UNI DIRECTIOAL) GRADE SEPARATOR APPROACH WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) Built-up Section |
| 274 | 504350 | 504640 | 290 | TCS-9FF-9CC | 6-LANE DIVIDED HIGHWAY WITH LOP SIDED APPROACHES (RHS GREATER THAN LHS) OF FLYOVER / GRADE SEPARATOR / UNDERPASS (OPEN COUNTRY) Built-up Section |
| 275 | 504640 | 504860 | 220 | TCS-9BB | 6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (OPEN COUNTRY) |
| 276 | 504860 | 505080 | 220 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 277 | 505080 | 505780 | 700 | TCS-3B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH LEFT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 278 | 505780 | 506700 | 920 | TCS-13BB | 6-LANE DIVIDED HIGHWAY WITH RIGHT SIDE (UNI DIRECTIOAL) GRADE SEPARATOR APPROACH WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 279 | 506700 | 506800 | 100 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 280 | 506800 | 507350 | 550 | TOLL PLAZA | (TOLL PLAZA) |
| 281 | 507350 | 507650 | 300 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 282 | 507650 | 507780 | 130 | TCS-24 | 6-LANE DIVIDED HIGHWAY WITH ECCENTRIC WIDENING AND WITH LEFT SIDE SERVICE ROAD (BUILT-UP SECTION) |
| 283 | 507780 | 508710 | 930 | TCS-25B | 6-LANE DIVIDED HIGHWAY WITH ECCENTRIC WIDENING AND WITH LEFT SIDE 5.5M & RIGHT SIDE 7.0m SERVICE ROAD (BUILT-UP SECTION) |
| 284 | 508710 | 509290 | 580 | TCS-25A | 6-LANE DIVIDED HIGHWAY WITH ECCENTRIC WIDENING AND WITH BOTH SIDE 5.5m SERVICE ROAD (BUILT-UP SECTION) |
| 285 | 509290 | 509800 | 510 | TCS-26 | 6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES |
| 286 | 509800 | 510120 | 320 | TCS-15 | 6-LANE DIVIDED HIGHWAY WITH APPROACHES OF NEW BRIDGE ON LEFT SIDE AND RETAINING EXISTING (2+2 LANE) BRIDGES ON RIGHT SIDE |
| 287 | 510120 | 510400 | 280 | TCS-2B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY) |
| 288 | 510400 | 510960 | 560 | TCS-9BB | 6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (OPEN COUNTRY) |
| 289 | 510960 | 512370 | 1410 | TCS-1 | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITHOUT SERVICE ROADS (OPEN COUNTRY) |
| 290 | 512370 | 512540 | 170 | TCS-3B | 6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH LEFT SIDE SERVICE ROAD (OPEN COUNTRY) |
| 291 | 512540 | 513200 | 660 | TCS-9BB | 6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (OPEN COUNTRY) |
| 292 | 513200 | 513550 | 350 | TCS-20 | 6-LANE DIVIDED HIGHWAY WITH REALIGNED / BYPASS SECTIONS AND WITH BOTH SIDE SERVICE ROAD |
| 293 | 513550 | 514800 | 1250 | TCS-20 | 6-LANE DIVIDED HIGHWAY WITH REALIGNED / BYPASS SECTIONS AND WITH BOTH SIDE SERVICE ROAD |
| 294 | 514800 | 515200 | 400 | TCS-9BB | 6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (OPEN COUNTRY) |
| 295 | 515200 | 515550 | 350 | TCS-20 | 6-LANE DIVIDED HIGHWAY WITH REALIGNED / BYPASS SECTIONS AND WITH BOTH SIDE SERVICE ROAD |

APPROVED

3/11/16

GOOD FOR CONSTRUCTION



Reviewed

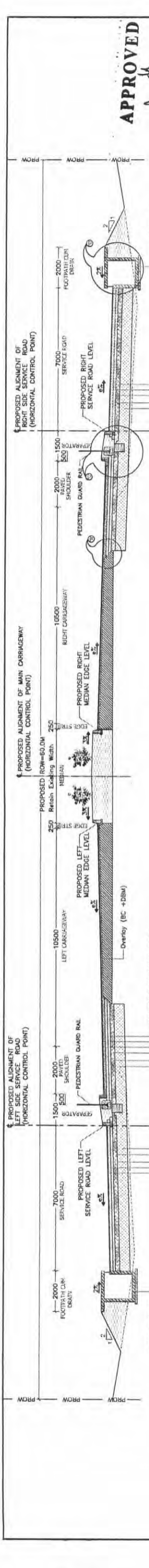
| SR.NO | APPLICABLE LOCATIONS | | LENGTH (M) | TCS - TYPE | DESCRIPTION OF TCS |
|-------|----------------------|--------|------------|------------|---|
| | FROM | TO | | | |
| 296 | 515550 | 516450 | 900 | TCS-9BB | 6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (OPEN COUNTRY) |
| 297 | 516450 | 516700 | 250 | TCS-20 | 6-LANE DIVIDED HIGHWAY WITH REALIGNED / BYPASS SECTIONS AND WITH BOTH SIDE SERVICE ROAD |
| 298 | 516700 | 517715 | 1015 | TCS-19 | 6-LANE DIVIDED HIGHWAY WITH NEW CONSTRUCTION OF REALIGNED / BYPASS SECTIONS WITHOUT SERVICE ROAD |
| 299 | 517715 | 517900 | 185 | TCS-20 | 6-LANE DIVIDED HIGHWAY WITH REALIGNED / BYPASS SECTIONS AND WITH BOTH SIDE SERVICE ROAD |
| 300 | 517900 | 518600 | 700 | TCS-9BB | 6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (OPEN COUNTRY) |
| 301 | 518600 | 519100 | 500 | TCS-19 | 6-LANE DIVIDED HIGHWAY WITH NEW CONSTRUCTION OF REALIGNED / BYPASS SECTIONS WITHOUT SERVICE ROAD |
| 302 | 519100 | 519700 | 600 | TCS-9BB | 6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (OPEN COUNTRY) |
| 303 | 519700 | 519830 | 130 | TCS-20 | 6-LANE DIVIDED HIGHWAY WITH REALIGNED / BYPASS SECTIONS AND WITH BOTH SIDE SERVICE ROAD |
| 304 | 519830 | 520150 | 320 | TCS-9BB | 6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (OPEN COUNTRY) |
| 305 | 520150 | 521120 | 970 | TCS-10 | 6-LANE DIVIDED HIGHWAY WITH ELEVATED R.O.B. APPROACHES AND WITH BOTH SIDE SERVICE ROADS |

Subinsh.  **REVIEWED**

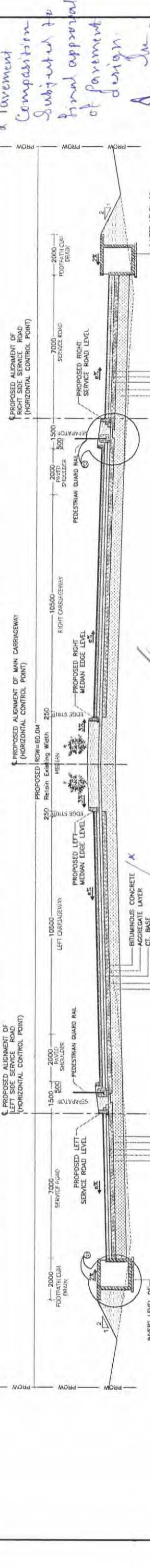
APPROVED

 3/12/14
GOOD FOR CONSTRUCTION

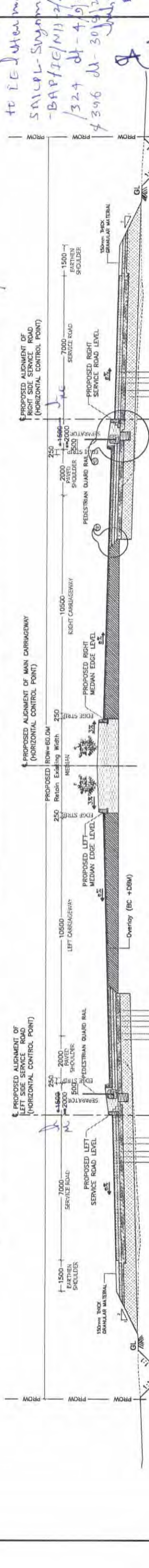




TCS - 02A
6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (BUILT-UP SECTION)
 (APPLICABLE WHERE SITE CONSTRAINT AND LIMITATION OF PROPOSED R.O.W.)



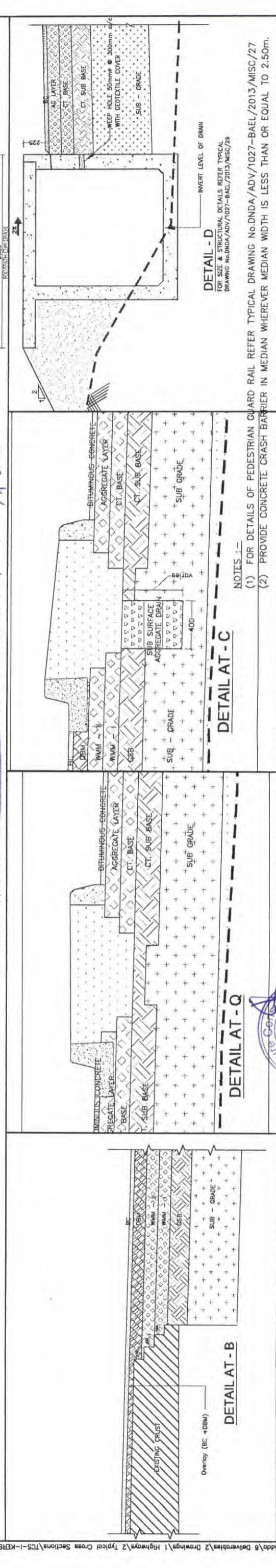
TCS - 02A (R/C)
6-LANE DIVIDED HIGHWAY WITH RECONSTRUCTION AND WITH BOTH SIDE SERVICE ROAD (BUILT-UP SECTION)
 (APPLICABLE WHERE SITE CONSTRAINT AND LIMITATION OF PROPOSED R.O.W.)



TCS - 02B
6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY)
 NOTE: * - * (APPLICABLE WHERE SITE CONSTRAINT AND LIMITATION OF PROPOSED R.O.W.)
 NOTE: * - * (APPLICABLE WHERE NO SITE CONSTRAINT AND LIMITATION OF PROPOSED R.O.W.)

APPROVED
GOOD FOR CONSTRUCTION

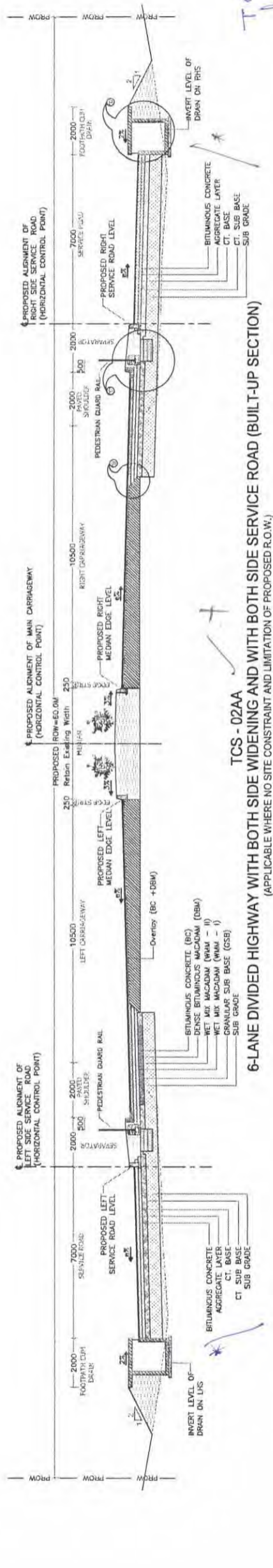
*a pavement composition
 submitted to
 final approval
 of parent
 design.
 J.P.C.
 TCS - Submitted
 to IE later on.
 SAICPL-Syngam
 -BAP/IC/M/11-2/2014
 /324 dt - 4/9/2014
 4396 dt - 30/9/2014
 J.P.C.*



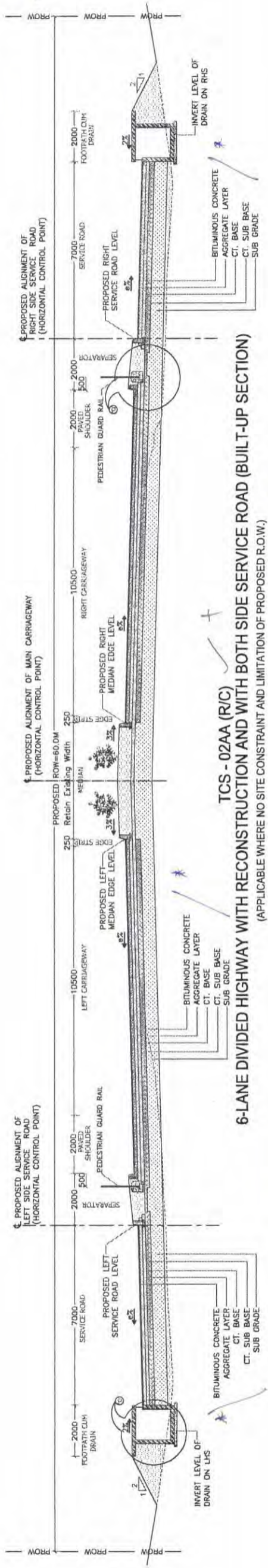
| | | | | |
|---|---|---|--|--|
| CLIENT: NATIONAL HIGHWAYS AUTHORITY OF INDIA | PROJECT: Six-laning of Barwa-Adda-Panagath Section of NH-2 from km 398.240 to km 521.120 including Panagath Bypass in States of Jharkhand and West Bengal under NHDP Phase V on Toll on DBFOT Pattern | DESIGN BY: IL&FS Transportation IL&FS Transportation Networks Limited | GOOD FOR CONSTRUCTION | GOOD FOR CONSTRUCTION |
| | | | REV. 02/01/2015 REVISION AS PER COMMENTS FOR SUBMISSION | REV. 14/10/2014 REVISION AS PER COMMENTS FOR SUBMISSION |
| DATE: 06/01/2015 - 3:05pm PATH: \\DMS\Y1027\Brow\Adda\8\Deliverables\2 Drawings\2 Typical Cross Sections\TCS-1-KERB_P.dwg | CONTRACTOR: Barwa Adda Expressway Limited | DESIGNER: IL&FS Transportation | SCALE: AS SHOWN | REVISION: RZ |

APPROVED
GOOD FOR CONSTRUCTION

TCS - Subjunctive to I.E.
Letter no. SADEPL-Sugam
D-N-P/IE/NH-2/2014/324
dated - 4/9/2014.
A.L.

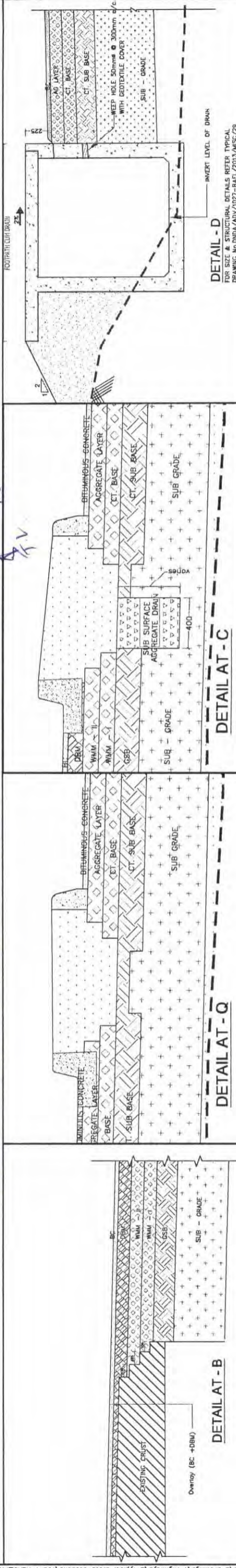


TCS - 02AA
6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (BUILT-UP SECTION)
(APPLICABLE WHERE NO SITE CONSTRAINT AND LIMITATION OF PROPOSED R.O.W.)



TCS - 02AA (R/C)
6-LANE DIVIDED HIGHWAY WITH RECONSTRUCTION AND WITH BOTH SIDE SERVICE ROAD (BUILT-UP SECTION)
(APPLICABLE WHERE NO SITE CONSTRAINT AND LIMITATION OF PROPOSED R.O.W.)

** Pavement Composition subjected to finalization of pavement design. June 14/14*



DETAIL - D
FOR SIZE & STRUCTURAL DETAILS REFER TYPICAL DRAWING No.DNDA/ADV/1027-BAEL/2013/MISC/27
DRAWING No.DNDA/ADV/1027-BAEL/2013/MISC/29

DETAIL - C

DETAIL - B

DETAIL - A

DETAIL - D

DETAIL - C

DETAIL - B

DETAIL - A

DETAIL - D

DETAIL - C

DETAIL - B

DETAIL - A

DETAIL - D

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DETAIL - B

DETAIL - A

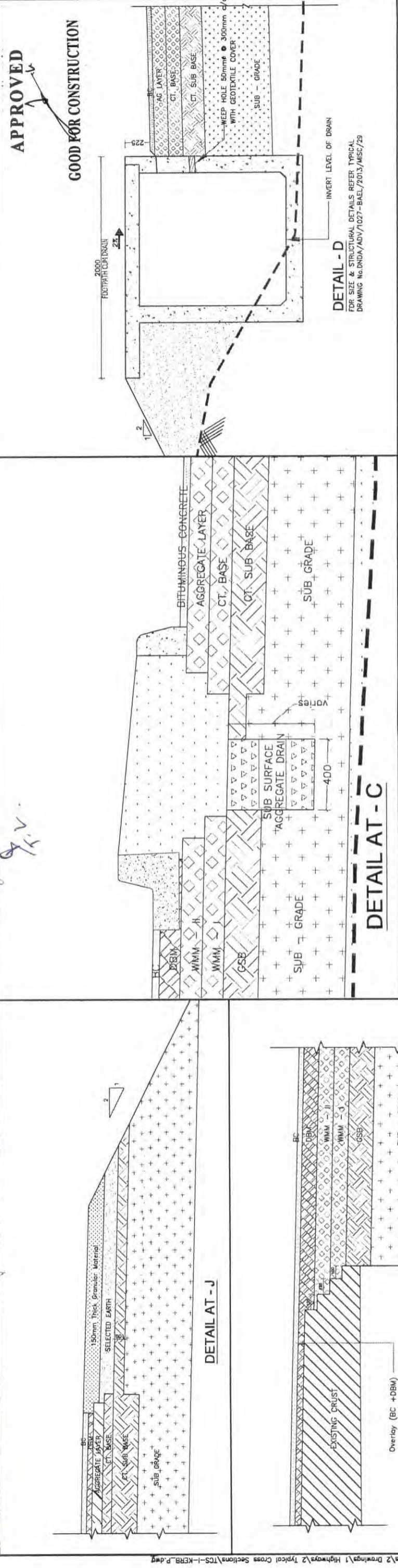
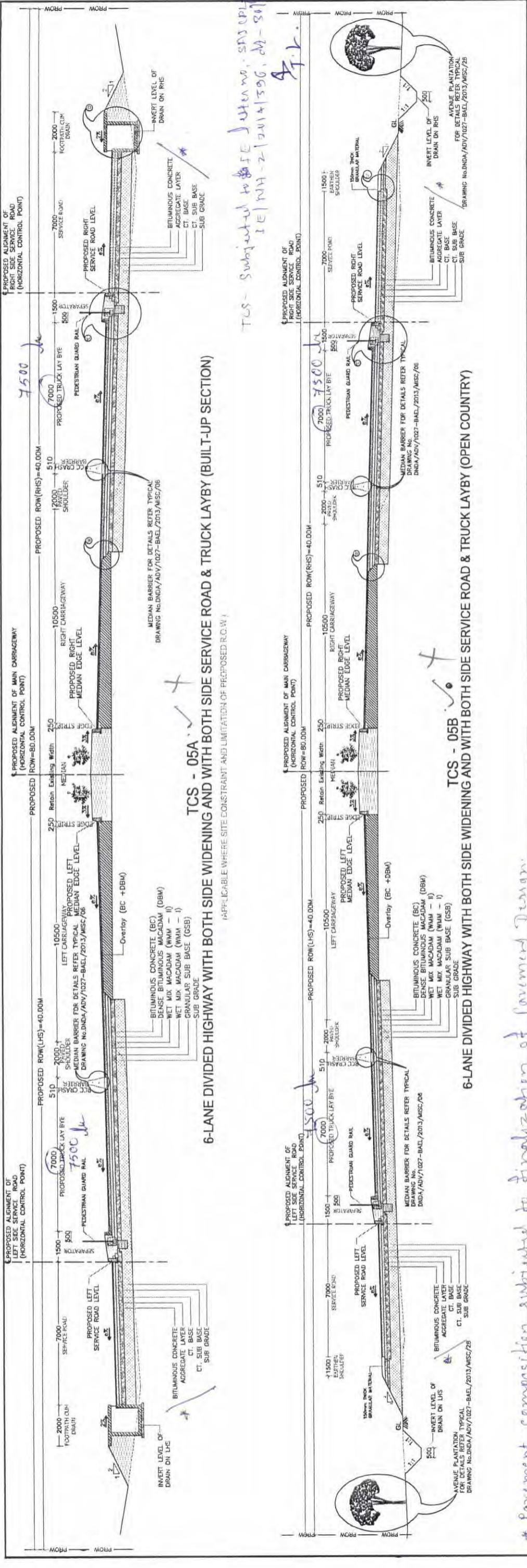
DETAIL - D

DETAIL - C

DETAIL - B

DETAIL - A

DETAIL - D



NOTES :-
 (1) FOR DETAILS OF PEDESTRIAN GUARD RAIL REFER TYPICAL DRAWING No.DNDA/ADV/1027-BAL/2013/MISC/27
 (2) PROVIDE CONCRETE CRASH BARRIER IN MEDIAN WHEREVER MEDIAN WIDTH IS LESS THAN OR EQUAL TO 2.50m.

| | |
|-------------------------|-------------------------|
| DESIGNED BY : M.M. | DESIGNED BY : I.C. |
| CHECKED BY : A.M. | CHECKED BY : A.M. |
| RECOMMENDED BY : A.R.M. | RECOMMENDED BY : A.R.M. |
| APPROVED BY : H.R.B. | APPROVED BY : H.R.B. |
| SCALE : | SCALE : |

GOOD FOR CONSTRUCTION

| REV. | DATE | DESCRIPTION |
|------|------------|---------------------------|
| 02 | 05/01/2015 | REVISED AS PER E COMMENTS |
| 01 | 14/10/2014 | REVISED AS PER E COMMENTS |
| 00 | 27/03/2014 | FOR SUBMISSION |

DESIGN BY : **IL&FS Transportation**
 IL&FS Transportation Networks Limited

INDEPENDENT ENGINEER : **Barwa Adda Expressway Limited**

CONCRESSIONAIRE : **Barwa Adda Expressway Limited**

PROJECT : Six-laning of Barwa-Adda-Panagah Section of NH-2 from km 398.240 to km 521.120 including Panagah Bypass in States of Jharkhand and West Bengal under NHDP Phase V on Toll on DBFOT Pattern

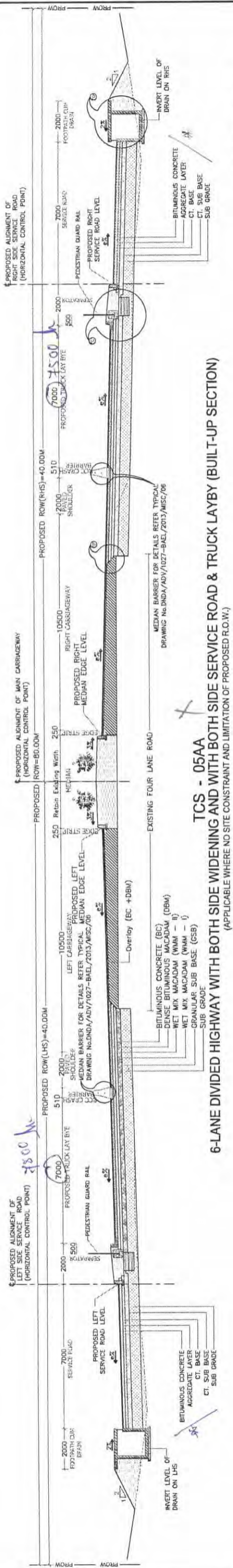
CLIENT : **NATIONAL HIGHWAYS AUTHORITY OF INDIA**

TITLE : **TYPICAL CROSS SECTION TYPE - 05A & 5B**

DRG. NO. : DND/ADV/1027-BAL/2013/ITCS/05

REVISION : R2

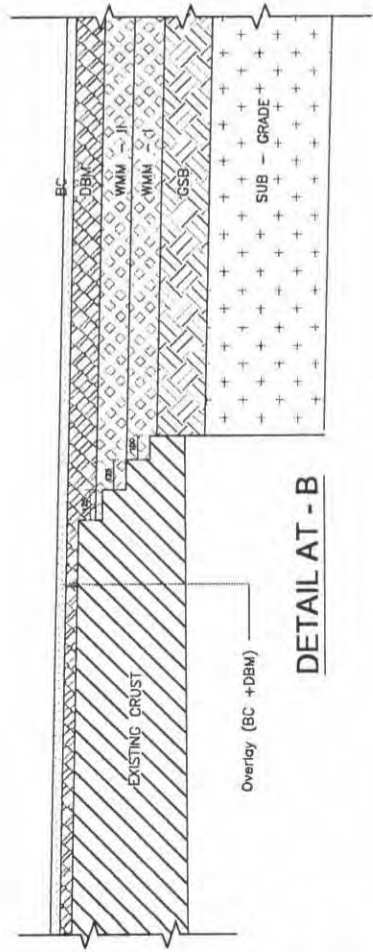
* Pavement composition subjected to finalization of Pavement Design



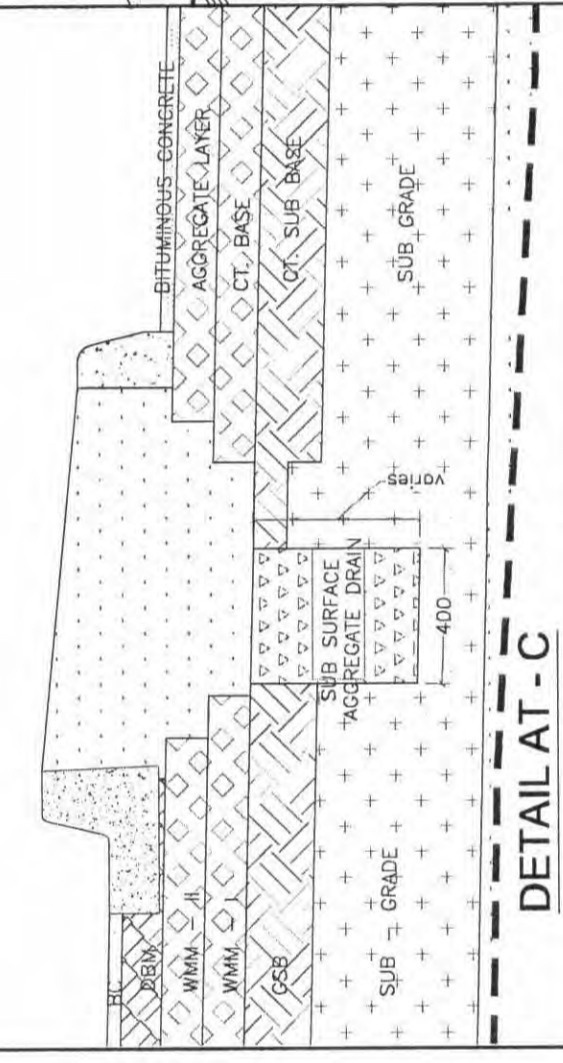
TCS - 05AA
6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD & TRUCK LAYBY (BUILT-UP SECTION)
 (APPLICABLE WHERE NO SITE CONSTRAINT AND LIMITATION OF PROPOSED R.O.W.)

APPROVED
GOOD FOR CONSTRUCTION

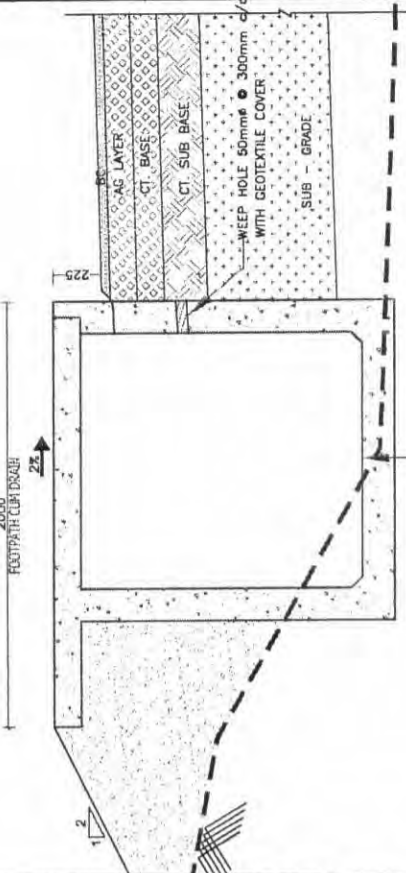
Handwritten notes:
 Pavement composition is subjected to finalization of Pavement Design by H
 Yes - subjected to E
 20/11/14
 J.L. RE



DETAIL AT - B



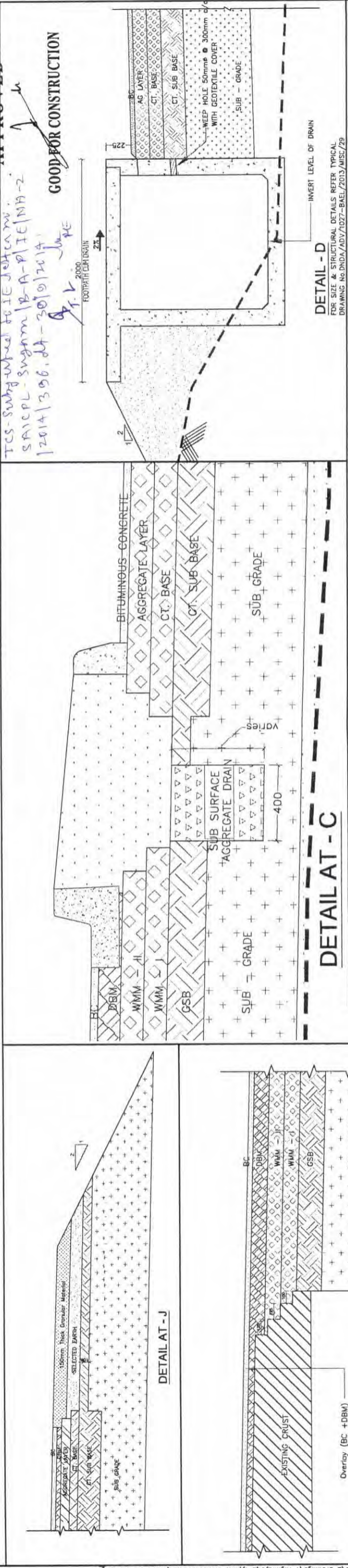
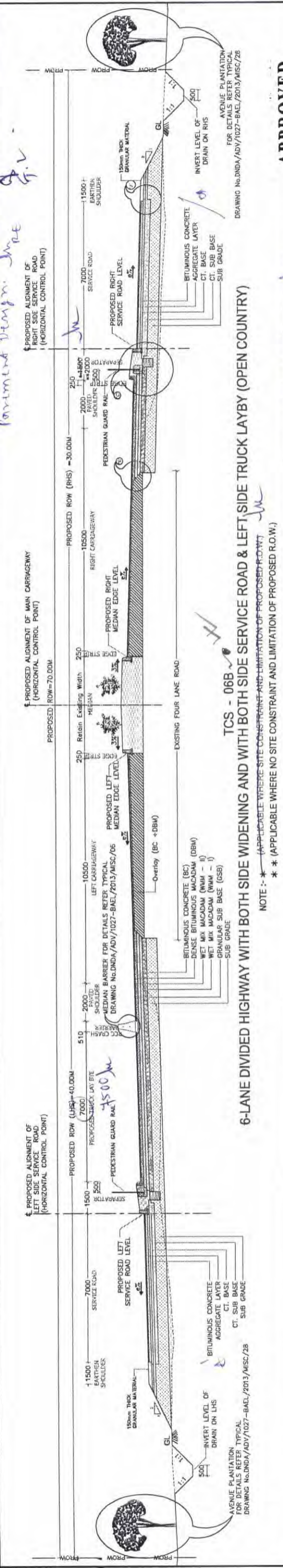
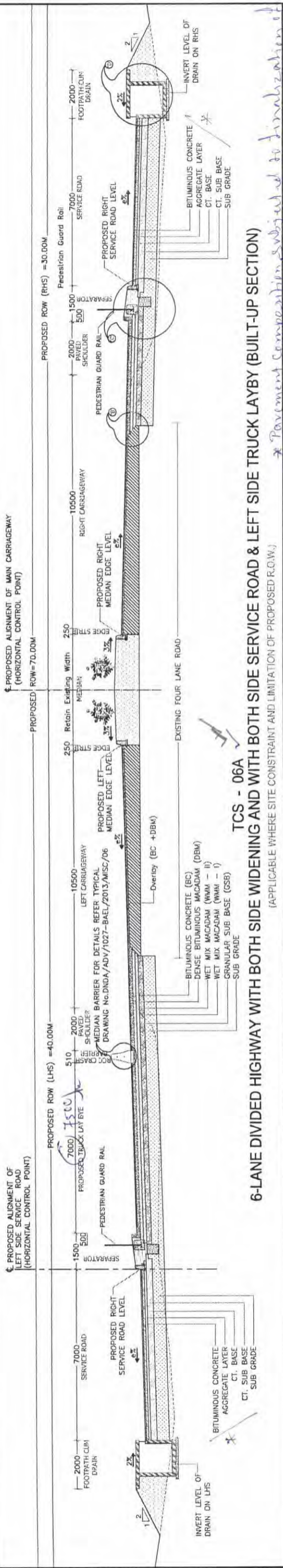
DETAIL AT - C



DETAIL - D
 FOR SIZE & STRUCTURAL DETAILS REFER TYPICAL DRAWING No.DNDA/ADV/1027-BAEL/2013/MISC/29

NOTES :-
 (1) FOR DETAILS OF PEDESTRIAN GUARD RAIL REFER TYPICAL DRAWING No.DNDA/ADV/1027-BAEL/2013/MISC/27
 (2) PROVIDE CONCRETE CRASH BARRIER IN MEDIAN WHEREVER MEDIAN WIDTH IS LESS THAN OR EQUAL TO 2.50m.

| | | | | | |
|--|--|---|--|---|------------------------------|
| CLIENT : NATIONAL HIGHWAYS AUTHORITY OF INDIA | PROJECT : Six-laning of Barwa-Adda-Panagarh Section of NH-2 from Km 398.240 to km 521.120 including Panagarh Bypass in States of Jharkhand and West Bengal under NHDP Phase V on Toll on DBFOT Pattern | INDEPENDENT ENGINEER : S.T.S.A. Infrastructure Consultants Pvt. Ltd. CONcessionaire : Barwa Adda Expressway Limited | DESIGN BY : IL&FS Transportation IL&FS Transportation Networks Limited | GOOD FOR CONSTRUCTION | GOOD FOR CONSTRUCTION |
| | | | | R2 05/01/2015 R1 14/10/2014 R0 19/09/2014 | REV. DATE DESCRIPTION |
| | | | | DRG. NO. : DNDA/ADV/1027-BAEL/2013/ITCS/5AA | REVISION : R2 |



APPROVED
GOOD FOR CONSTRUCTION

TCS Subj. when to be taken up. SAICPL - Sngam 18-A-PIE/NH-2 12/01/2014. June 2014

NOTES :-
 (1) FOR DETAILS OF PEDESTRIAN GUARD RAIL REFER TYPICAL DRAWING No.DNDA/ADV/1027-BAEL/2013/MISC/27
 (2) PROVIDE CONCRETE CRASH BARRIER IN MEDIAN WHEREVER MEDIAN WIDTH IS LESS THAN OR EQUAL TO 2.50m.

DESIGN BY: IIL&S Transportation
 IIL&S Transportation Networks Limited

CONSTRUCTION: GOOD FOR CONSTRUCTION

CLIENT: NATIONAL HIGHWAYS AUTHORITY OF INDIA

PROJECT: Six-laning of Barwa-Adda-Panagath Section of NH-2 from km 398.240 to km 521.120 including Panagath Bypass in States of Jharkhand and West Bengal under NHDP Phase V on Toll on DBFOT Pattern

CONTRACTOR: Barwa Adda Expressway Limited

DESIGNER: IIL&S Transportation Networks Limited

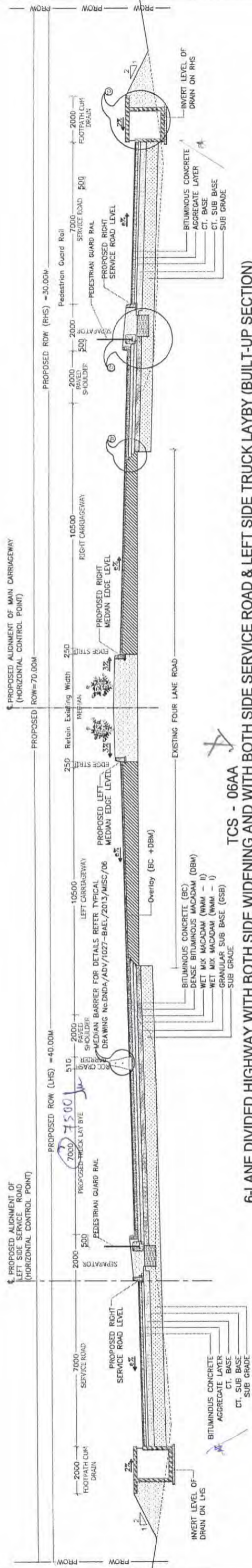
CONSTRUCTION: GOOD FOR CONSTRUCTION

REVISIONS:

| REV | DATE | DESCRIPTION |
|-----|------------|--------------------------|
| R2 | 05/01/2015 | REVISION AS PER COMMENTS |
| R1 | 14/10/2014 | REVISION AS PER COMMENTS |
| R0 | 27/01/2014 | FOR SUBMISSION |

DRAWN BY: I.C.
DESIGNED BY: M.M.
CHECKED BY: A.M.
RECOMMENDED BY: A.R.M.
APPROVED BY: H.R.B.
SCALE:

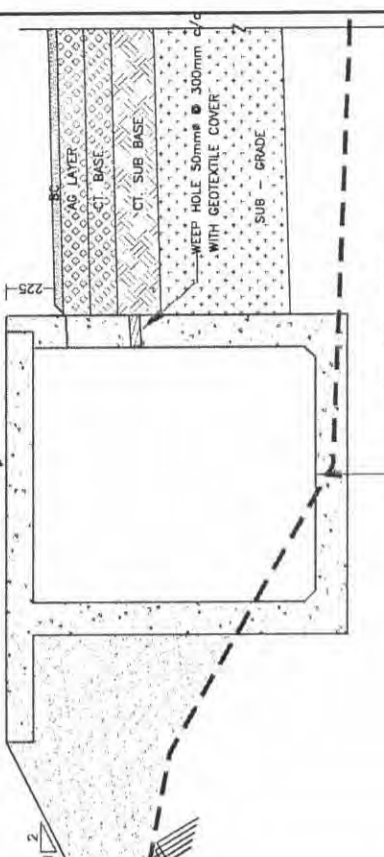
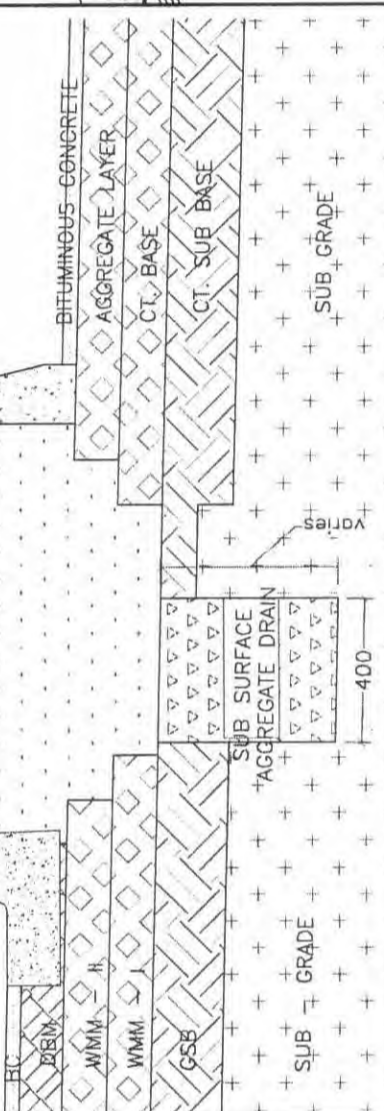
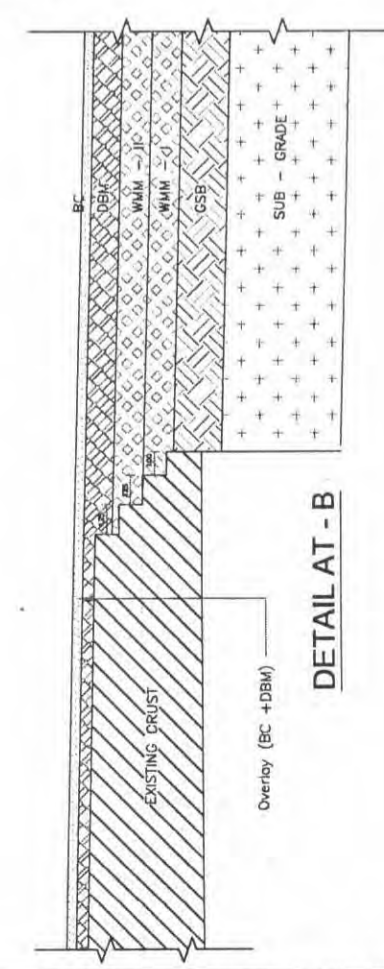
TITLE: TYPICAL CROSS SECTION TYPE - 06A & 6B
DRG. NO.: DNDA/ADV/1027-BAEL/2013/ITCS/06
REVISION: R2



TCS - 06AA
6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD & LEFT SIDE TRUCK LAYBY (BUILT-UP SECTION)
 (APPLICABLE WHERE NO SITE CONSTRAINT AND LIMITATION OF PROPOSED R.O.W.)

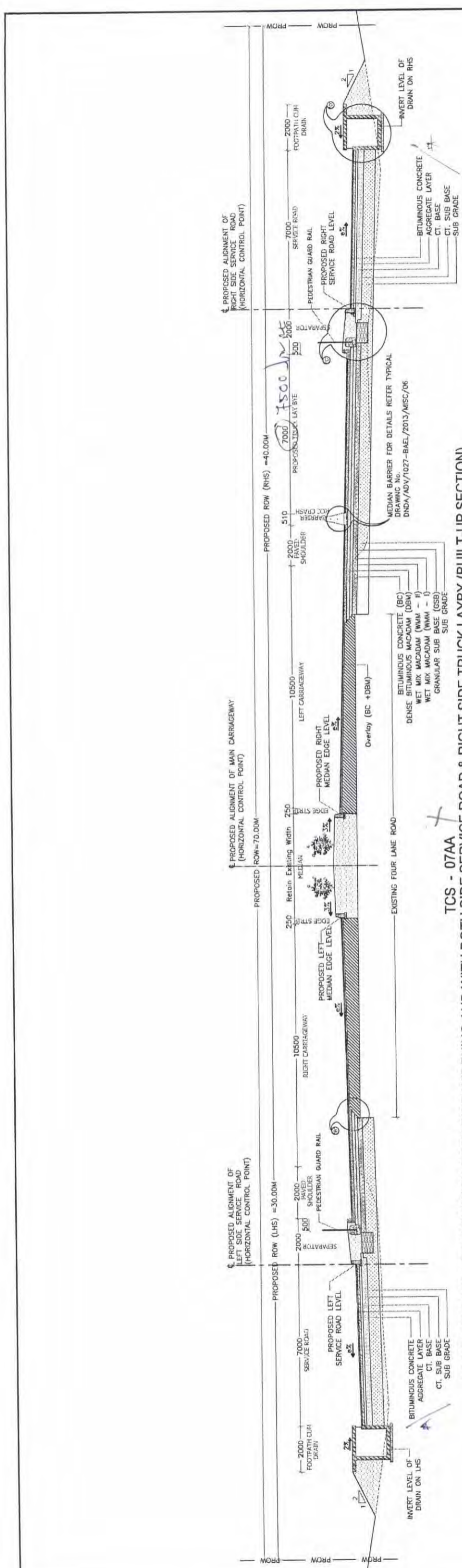
APPROVED
GOOD FOR CONSTRUCTION

** Pavement Composition Subjugated to IE Letter no. SAJCNL-Sugam/B-A-PIE/NH-2/2014/396 dt-30/01/14*



- NOTES :-**
- FOR DETAILS OF PEDESTRIAN GUARD RAIL REFER TYPICAL DRAWING No.DNDA/ADV/1027-BAE/2013/MISC/27
 - PROVIDE CONCRETE CRASH BARRIER IN MEDIAN WHEREVER MEDIAN WIDTH IS LESS THAN OR EQUAL TO 2.50m.

| | | | | |
|--|--|---|---|--|
| CLIENT : | PROJECT : Six-laning of Banwa-Adda-Panagah Section of NH-2 from km 398.240 to km 521.120 Including Panagah Bypass in States of Jharkhand and West Bengal under NHDP Phase V on Toll on DBFOT Pattern | DESIGN BY : IL&FS Transportation Networks Limited | GOOD FOR CONSTRUCTION REV. DATE DESCRIPTION R2 05/01/2015 REVISED AS PER E COMMENTS R1 14/10/2014 REVISED AS PER E COMMENTS R0 19/05/2014 FOR SUBMISSION | CONTRACTOR : Barwa Adda Expressway Limited |
| | | | | INDEPENDENT ENGINEER : S.A.I. Infrastructure Consultants Pvt. Ltd. |
| DRAWN BY : I.C. | CHECKED BY : M.M. | RECOMMENDED BY : A.R.M. | APPROVED BY : H.R.B. | SCALE : |
| TITLE : TYPICAL CROSS SECTION TYPE - 06AA | | DRG. NO. : DNDA/ADV/1027-BAE/2013/MISC/27 | | REVISION : R2 |

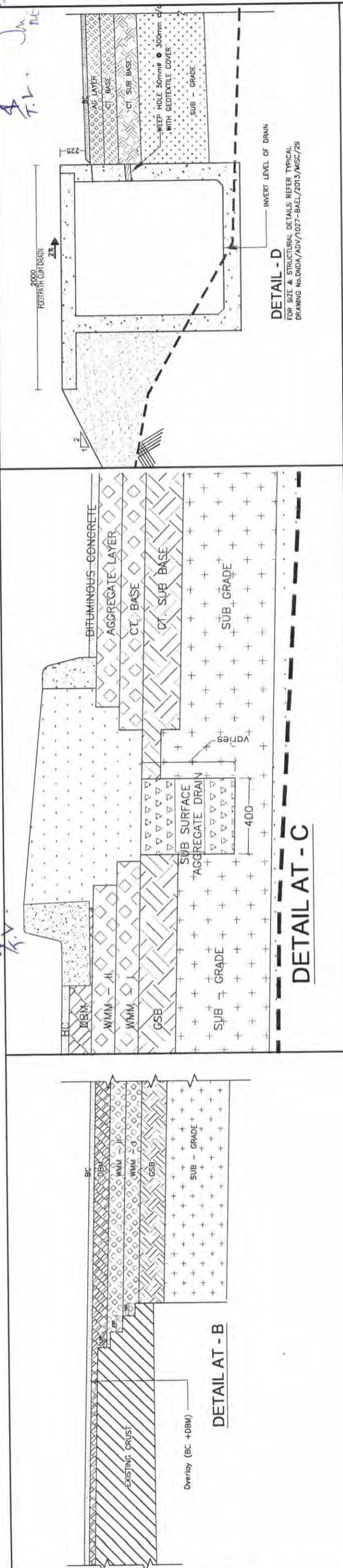


6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD & RIGHT SIDE TRUCK LAYBY (BUILT-UP SECTION)
 (APPLICABLE WHERE NO SITE CONSTRAINT AND LIMITATION OF PROPOSED R.O.W.)

APPROVED

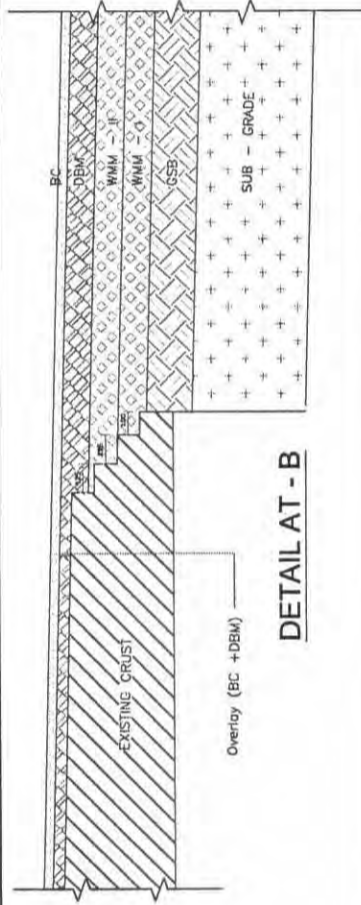
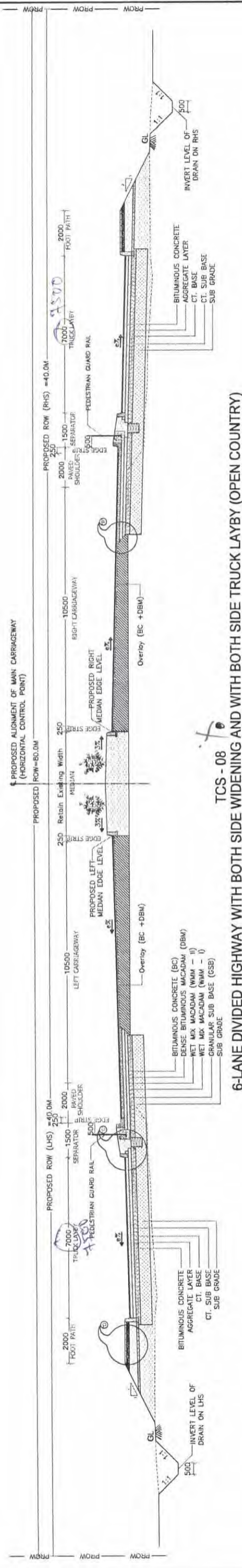
** Pavement composition subjected to finalization of pavement Design. J.M. NE*
TCS- subjected to section no - SAICPL-Sygam (B-A-P) I.E. (NH-2/2014/306) dt-30/11/2014

GOOD FOR CONSTRUCTION

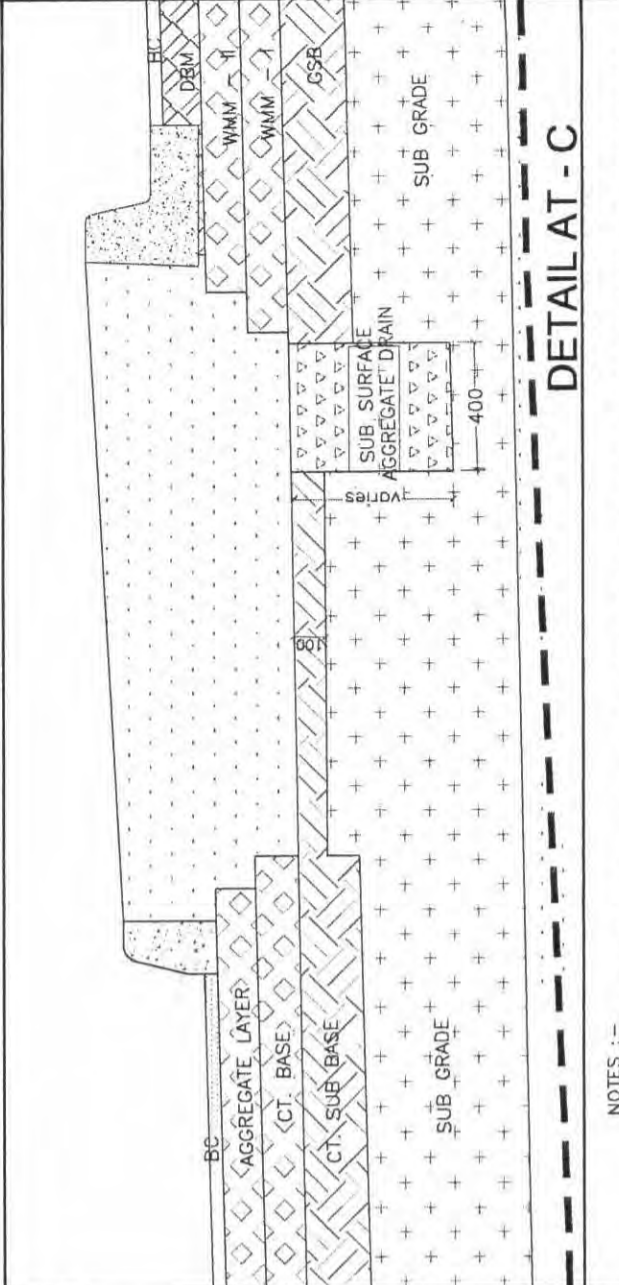
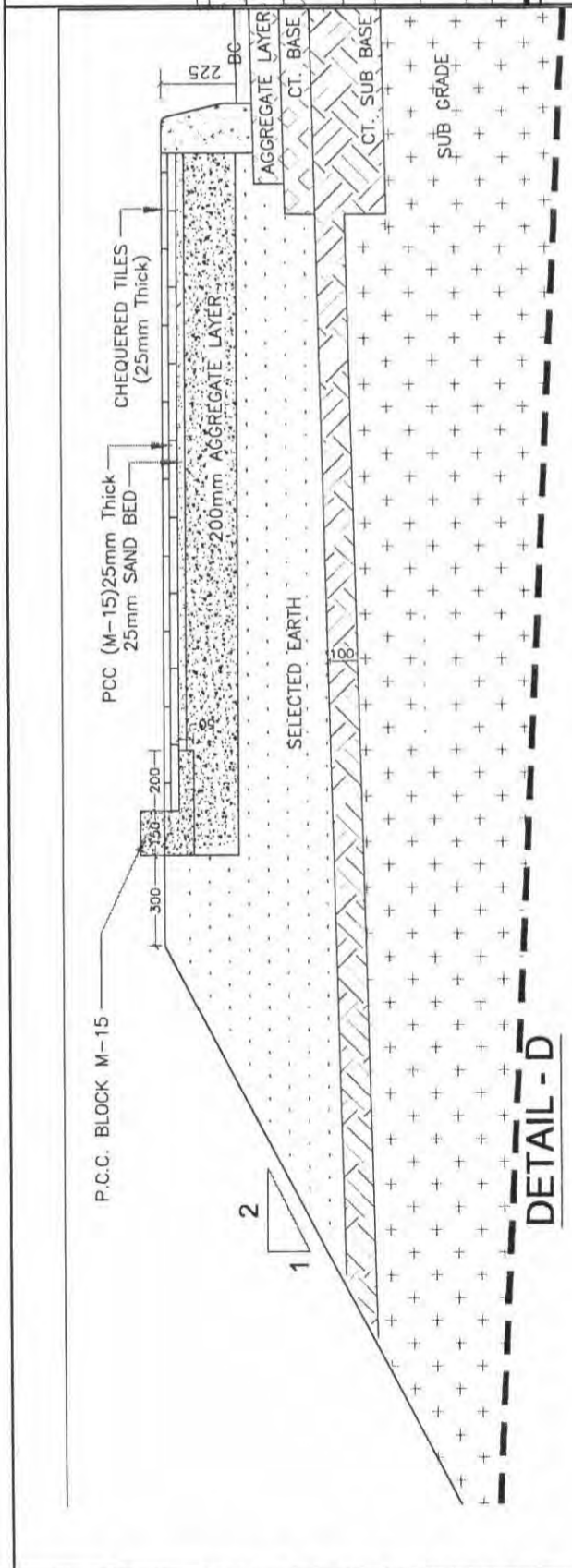


NOTES :-
 (1) FOR DETAILS OF PEDESTRIAN GUARD RAIL REFER TYPICAL DRAWING No.DNDA/ADV/1027-BAEL/2013/MISC/27
 (2) PROVIDE CONCRETE CRASH BARRIER IN MEDIAN WHEREVER MEDIAN WIDTH IS LESS THAN OR EQUAL TO 2.50m.

| | | | | | |
|---------------------|--|---|------------------------------|--------------------------------|--|
| CLIENT : | PROJECT : Six-laning of Barwa-Adda-Panagarh Section of NH-2 from km 398.240 to km 521.120 including Panagarh Bypass in States of Jharkhand and West Bengal under NHDP Phase V on Toll on DBFOT Pattern | DESIGN BY : IL&FS Transportation Networks Limited | GOOD FOR CONSTRUCTION | DRAWN BY : I.C. | TITLE : TYPICAL CROSS SECTION TYPE - 07AA |
| | | | | DESIGNED BY : M.M. | DRG. NO. : DNDA/ADV/1027-BAEL/2013/TCS/07AA |
| | | | | CHECKED BY : A.M. | REVISION : R2 |
| | | | | RECOMMENDED BY : A.R.M. | SCALE : |
| | | | | APPROVED BY : H.A.B. | REVISION : R2 |
| | | | | DATE : | DESCRIPTION : |

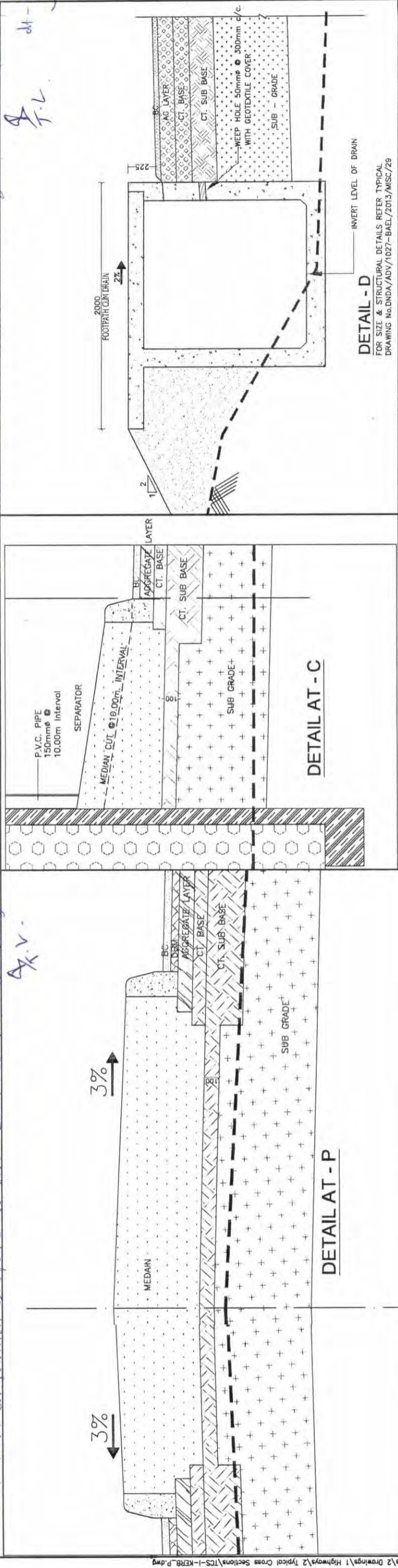
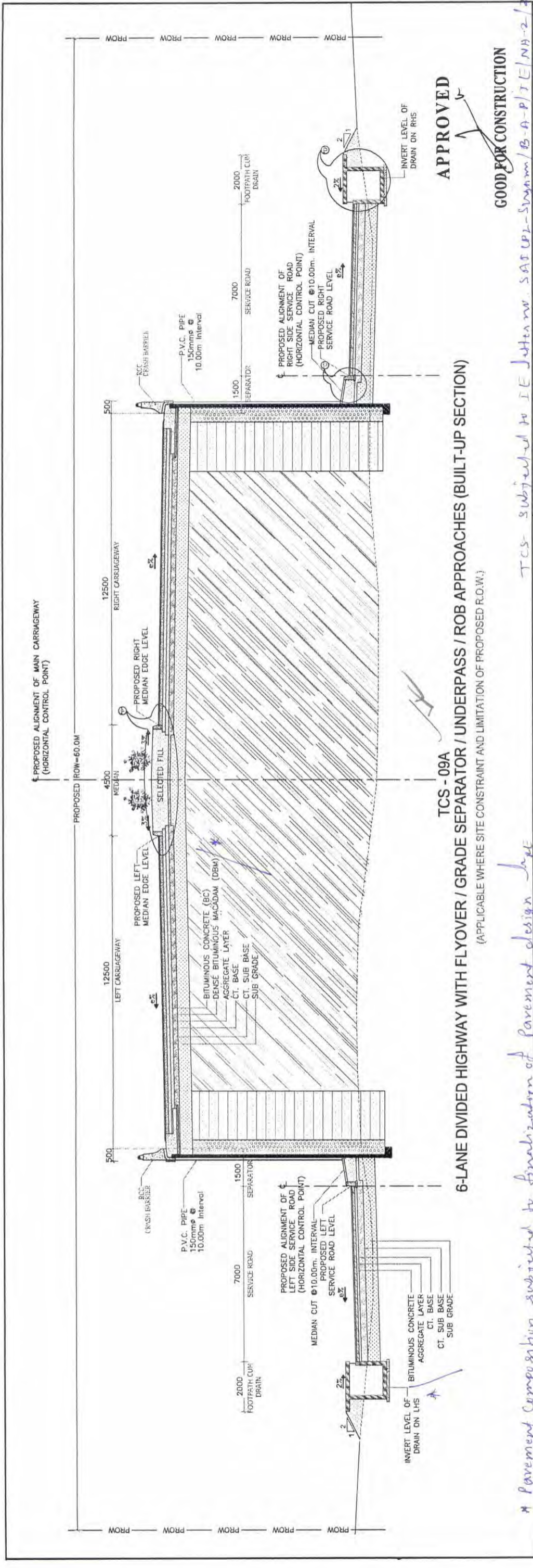


APPROVED
GOOD FOR CONSTRUCTION



NOTES :-
(1) FOR DETAILS OF PEDESTRIAN GUARD RAIL REFER TYPICAL DRAWING No.DNDA/ADV/1027-BAEL/2013/MISC/27
(2) PROVIDE CONCRETE CRASH BARRIER IN MEDIAN WHEREVER MEDIAN WIDTH IS LESS THAN OR EQUAL TO 2.50m.

| | | | | | | |
|---|---|--|--|--|---|------------------------|
| CLIENT: | PROJECT: Six-laning of Barwa-Adda-Panagarh Section of NH-2 from km 398.240 to km 521.120 including Panagarh Bypass in States of Jharkhand and West Bengal under NHDP Phase V on Toll on DBFOT Pattern | DESIGN BY: IL&FS Transportation Networks Limited | GOOD FOR CONSTRUCTION | REV. 01 05/01/2015 REVISION AS PER COMMENTS FOR SUBMISSION | DATE 27/01/2014 | DESCRIPTION |
| | | | | INDEPENDENT ENGINEER: S.A. Infrastructure Consultants Pvt. Ltd. 10-102, DSI, Green Road, Hyderabad, Andhra Pradesh - 500029 | CONCESSIONAIRE: Barwa Adda Expressway Limited | SCALE: R1 |
| CONSTRUCTION: BITUMINOUS CONCRETE AGGREGATE LAYER CT. SUB BASE SUB GRADE | CONSTRUCTION: BITUMINOUS CONCRETE (BC) DENSE BITUMINOUS MACADAM (DBM) WET MIX MACADAM (WMM - II) WET MIX MACADAM (WMM - I) GRANULAR SUB BASE (GSB) SUB GRADE | CONSTRUCTION: BITUMINOUS CONCRETE (BC) AGGREGATE LAYER CT. SUB BASE SUB GRADE | CONSTRUCTION: BITUMINOUS CONCRETE (BC) AGGREGATE LAYER CT. SUB BASE SUB GRADE | TITLE: TYPICAL CROSS SECTION TYPE - 08 | DRG. NO.: DNDA/ADV/1027-BAEL/2013/TCS/08 | REVISION: R1 |



6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (BUILT-UP SECTION)
TCS - 09A
 (APPLICABLE WHERE SITE CONSTRAINT AND LIMITATION OF PROPOSED R.O.W.)

APPROVED
GOOD FOR CONSTRUCTION

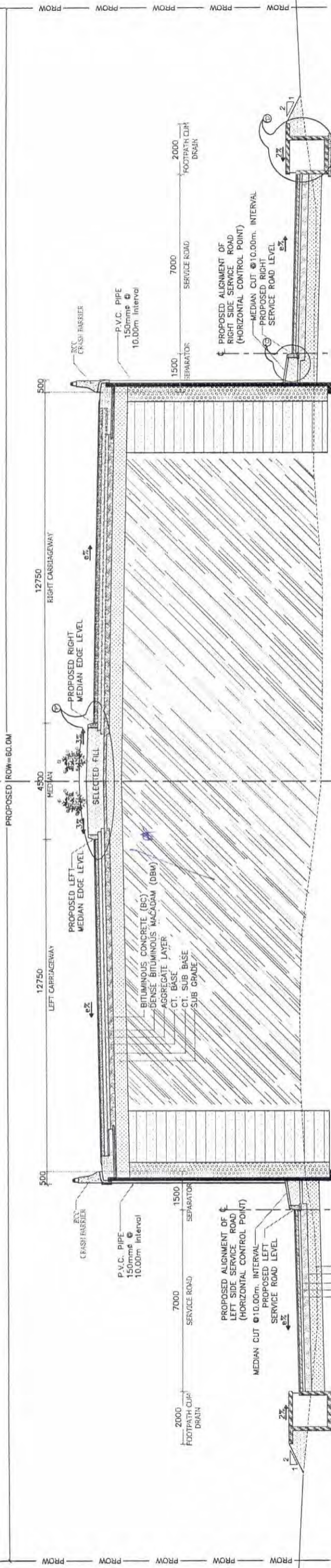
A Pavement Composition subjected to finalization of pavement design sheet

TCS subjected to I.E. Jetterwar, S.A. (U.P.) - Syam / B-A-P / I.E. / NH-2 / 2014 / 524 / 4/2/14

NOTES :-
 (1) FOR DETAILS OF PEDESTRIAN GUARD RAIL REFER TYPICAL DRAWING No.DNDA/ADV/1027-BAE/2013/MISC/27
 FOR SIZE & STRUCTURAL DETAILS REFER TYPICAL DRAWING No.DNDA/ADV/1027-BAE/2013/MISC/29
 (2) PROVIDE CONCRETE CRASH BARRIER IN MEDIAN WHEREVER MEDIAN WIDTH IS LESS THAN OR EQUAL TO 2.50m.

| | | | | | |
|---|--|---|------------------------------|---------------------------|---|
| CLIENT : | PROJECT : Six-laning of Barwa-Adda-Panagarh Section of NH-2 from km 398.240 to km 521.120 including Panagarh Bypass in States of Jharkhand and West Bengal under NHDP Phase V on Toll on DBFOT Pattern | DESIGN BY : IL&FS Transportation Networks Limited | GOOD FOR CONSTRUCTION | DRAWN BY : I.C. | TITLE : TYPICAL CROSS SECTION TYPE - 09A |
| | | | | DESIGNED BY : M.M. | DRG. NO. : DNDA/ADV/1027-BAE/2013/TCS/09A |
| INDEPENDENT ENGINEER : S.D. Infrastructure Consultants Pvt. Ltd. CONcessionaire: Barwa Adda Expressway Limited | REV. DATE DESCRIPTION R1 05/01/2015 REVISION AS PER COMMENTS FOR SUBMISSION R2 27/07/2014 FOR SUBMISSION | CHECKED BY : A.M. | APPROVED BY : H.R.B. | SCALE : | REVISION : R1 |

PROPOSED ALIGNMENT OF MAIN CARRIAGEWAY
(HORIZONTAL CONTROL POINT)



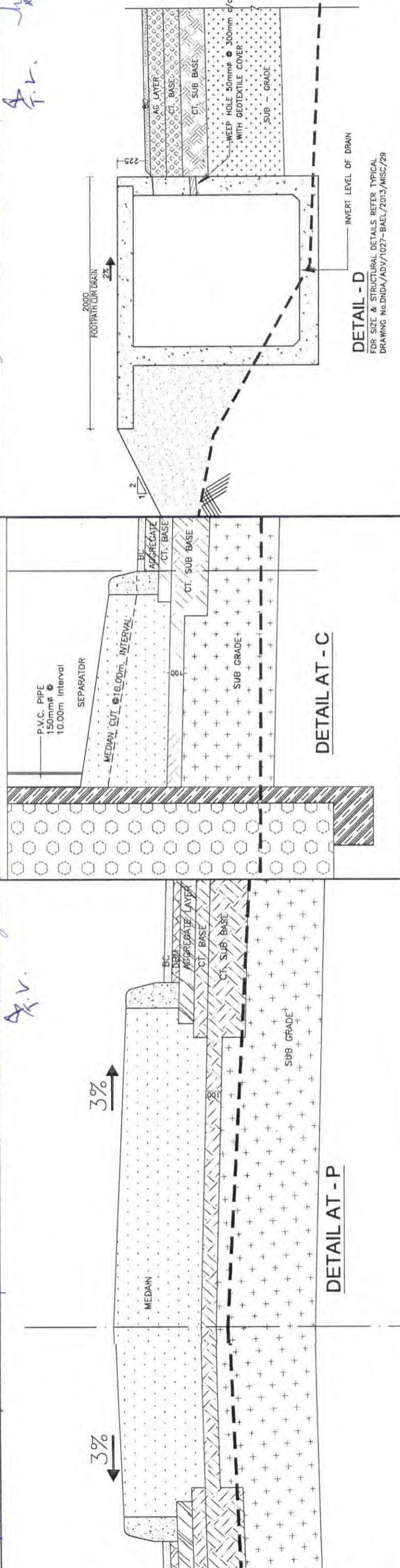
6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (BUILT-UP SECTION)
TCS - 09AA

(APPLICABLE WHERE NO SITE CONSTRAINT AND LIMITATION OF PROPOSED R.O.W.)

APPROVED

GOOD FOR CONSTRUCTION

Permeation Composition subjected to finalization of pavement design. hat
TCS - Subjoined to I.E. Jaffer ru - SAI CP 2 - Sigam/B-A-#1 I/E/NH-2/2014/324-01-10/2014
K.V.



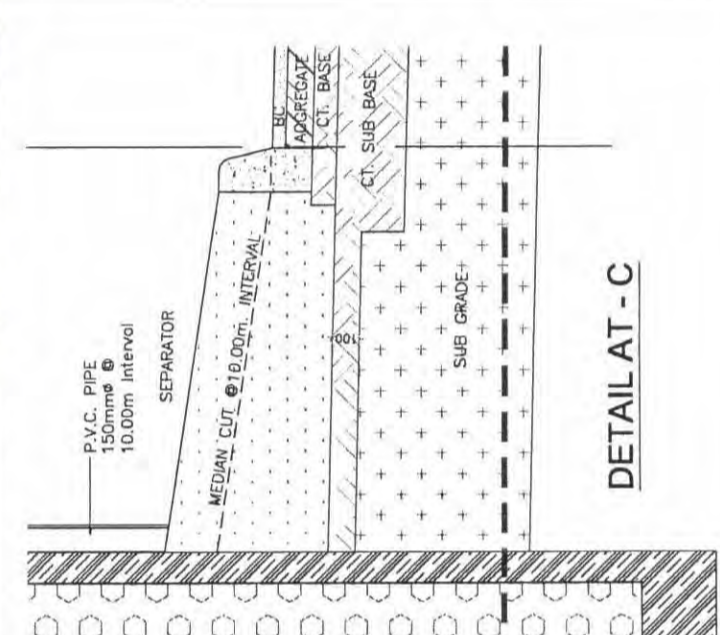
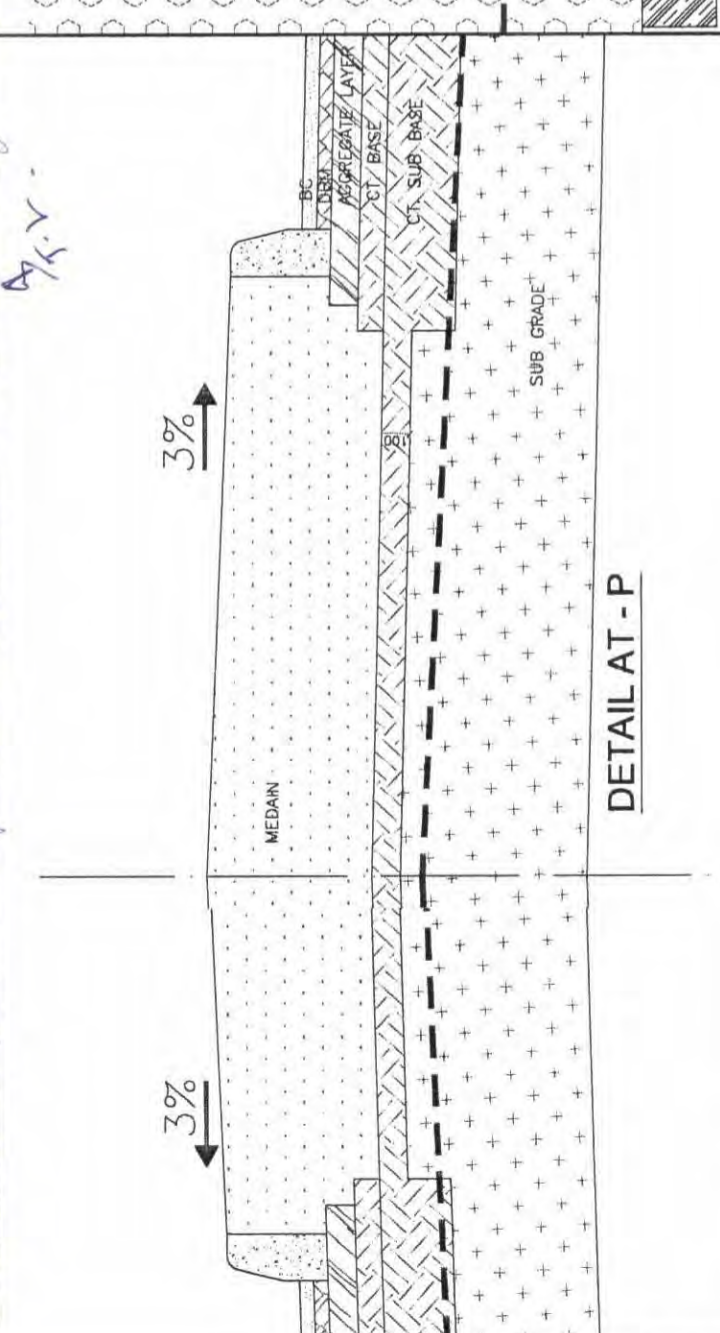
NOTES :-
(1) FOR DETAILS OF PEDESTRIAN GUARD RAIL REFER TYPICAL DRAWING No.DNDA/ADV/1027-BAEL/2013/MISC/27
(2) PROVIDE CONCRETE CRASH BARRIER IN MEDIAN WHEREVER MEDIAN WIDTH IS LESS THAN OR EQUAL TO 2.50m.

| | | | | | |
|--|---|---|---|--|--|
| <p>CLIENT: NATIONAL HIGHWAYS AUTHORITY OF INDIA</p> | <p>PROJECT: Six-laning of Barwa-Adda-Panagarh Section of NH-2 from km 398.240 to km 521.120 including Panagarh Bypass in States of Jharkhand and West Bengal under NHDP Phase V on Toll on DBFOT Pattern</p> | <p>INDEPENDENT ENGINEER: S.T.L. Infrastructure Consultants Pvt. Ltd. CONVESSIONAIRE: Barwa Adda Expressway Limited</p> | <p>DESIGN BY: IL&FS Transportation IL&FS Transportation Networks Limited</p> | <p>GOOD FOR CONSTRUCTION</p> | <p>TITLE: TYPICAL CROSS SECTION TYPE - 09AA</p> |
| | | | | <p>REV. DATE DESCRIPTION</p> <p>R1 05/01/2015 REVISED AS PER COMMENTS FOR SUBMISSION</p> <p>R2 19/08/2014 FOR SUBMISSION</p> | <p>SCALE: AS SHOWN</p> |



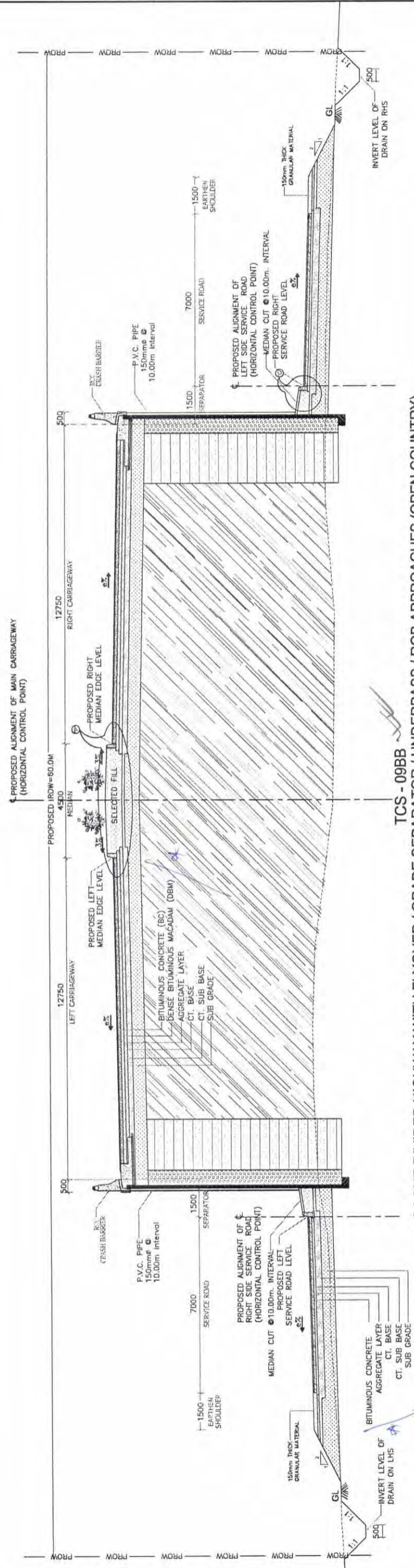
TCS - 09B
6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (OPEN COUNTRY)
 (APPLICABLE WHERE SITE CONSTRAINT AND LIMITATION OF PROPOSED R.O.W.)

* Pavement Composition Subjected to Finalization of Pavement design by T.C.S. - Subjected to I.E. Jagan Rao - SAIPR/15/2014/32-A, dt. 19/11/14
 GOOD FOR CONSTRUCTION
 APPROVED



NOTES :-
 (1) FOR DETAILS OF PEDESTRIAN GUARD RAIL REFER TYPICAL DRAWING No.DNDA/ADV/1027-BAL/2013/MISC/27
 (2) PROVIDE CONCRETE CRASH BARRIER IN MEDIAN WHEREVER MEDIAN WIDTH IS LESS THAN OR EQUAL TO 2.50m.

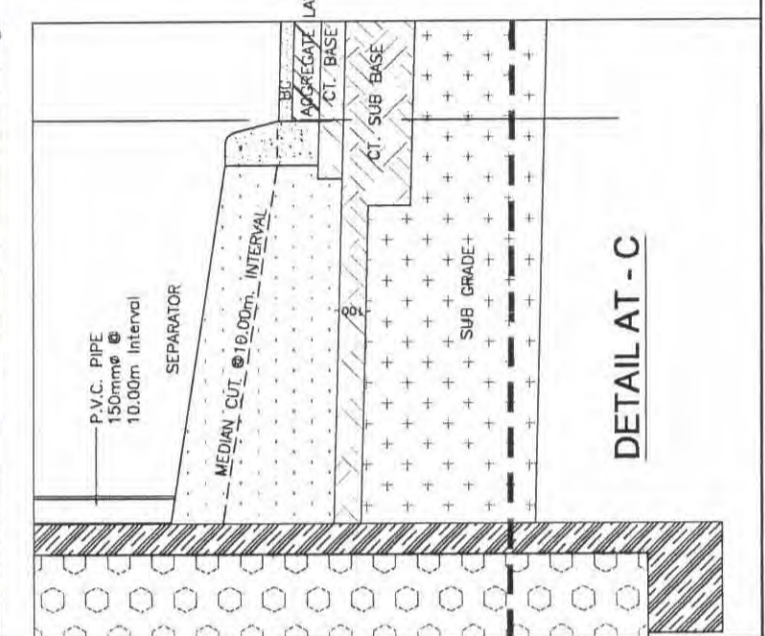
| | | | | | |
|--|--|--|--------------------------------|--|--|
| CLIENT : | PROJECT : Six-laning of Barwa-Adda-Panagath Section of NH-2 from km 398.240 to km 521.120 including Panagath Bypass in States of Jharkhand and West Bengal under NHDP Phase V on Toll on DBFOT Pattern | DESIGN BY : IL&S Transportation Networks Limited | GOOD FOR CONSTRUCTION | DRAWN BY : I.C. | TITLE : TYPICAL CROSS SECTION TYPE - 09B |
| | | | | DESIGNED BY : M.M. | |
| INDEPENDENT ENGINEER : S.A. Infrastructure Consultants Pvt. Ltd. CONSIGNAIRE : Barwa Adda Expressway Limited | CONSIGNAIRE : Barwa Adda Expressway Limited | REVISIONS: R1 06/01/2015 REVISED AS PER I.E COMMENTS FOR SUBMISSION R2 27/01/2014 | RECOMMENDED BY : A.R.M. | CHECKED BY : A.M. | APPROVED BY : H.R.B. |
| | | | | | |
| NATIONAL HIGHWAYS AUTHORITY OF INDIA | | REVISION : R1 | | DRG. NO. : DNDA/ADV/1027-BAL/2013/TCS/09B | |



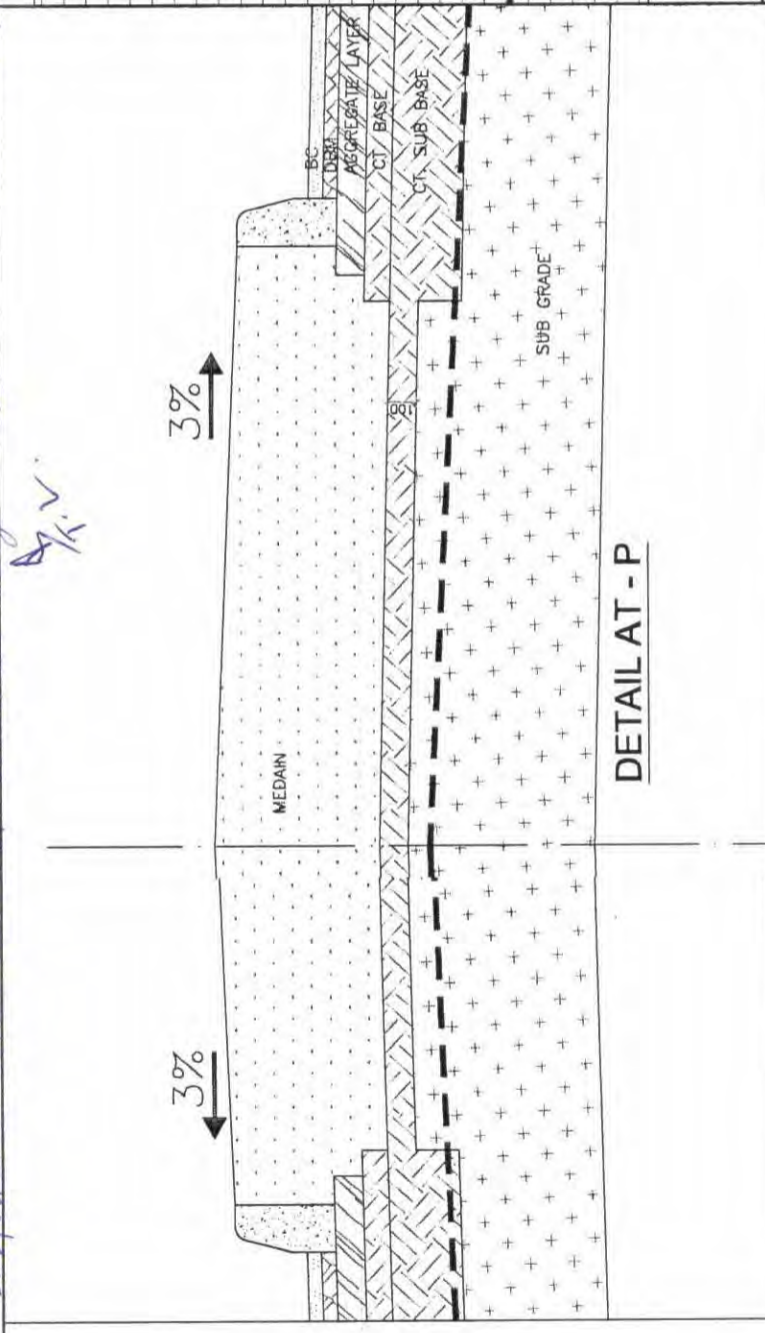
6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (OPEN COUNTRY)
TCS - 09BB
 (APPLICABLE WHERE NO SITE CONSTRAINT AND LIMITATION OF PROPOSED R.O.W.)

Handwritten notes:
 TCS - submitted to J.E. Jharkhand - SAEUL - Sanyam B.A. P.I.E. NH-2/2014
 10/11/14
 J.E. Jharkhand
 T.L.
APPROVED
GOOD FOR CONSTRUCTION

Handwritten note:
 * Pavement composition subjected to finalization of parent design. Jharkhand
 J.E. Jharkhand



DETAIL AT - C



DETAIL AT - P

NOTES :-
 (1) FOR DETAILS OF PEDESTRIAN GUARD RAIL REFER TYPICAL DRAWING No.DNDA/ADV/1027-BAEL/2013/MISC/27
 (2) PROVIDE CONCRETE CRASH BARRIER IN MEDIAN WHEREVER MEDIAN WIDTH IS LESS THAN OR EQUAL TO 2.50m.

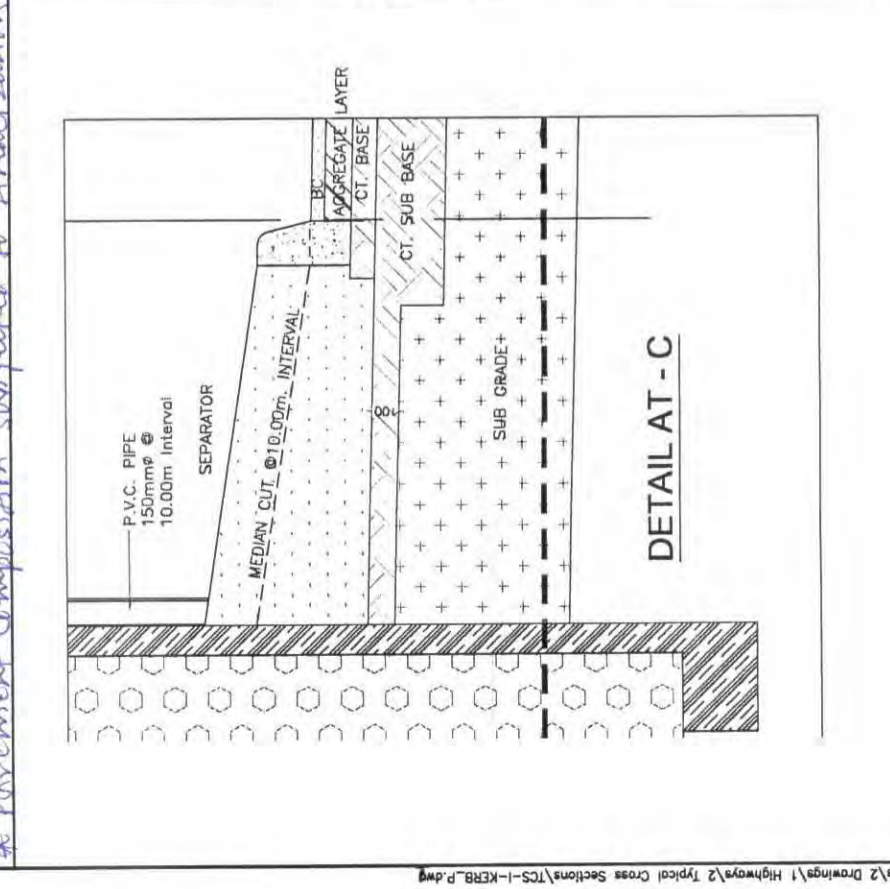
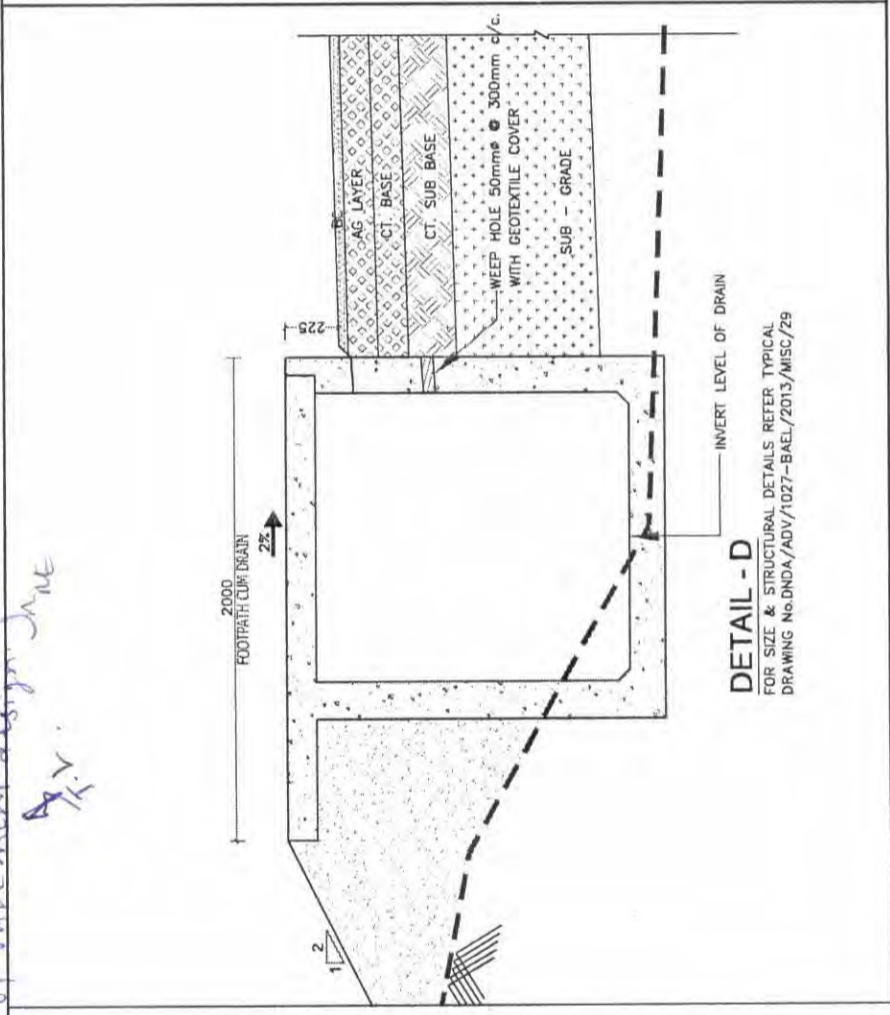
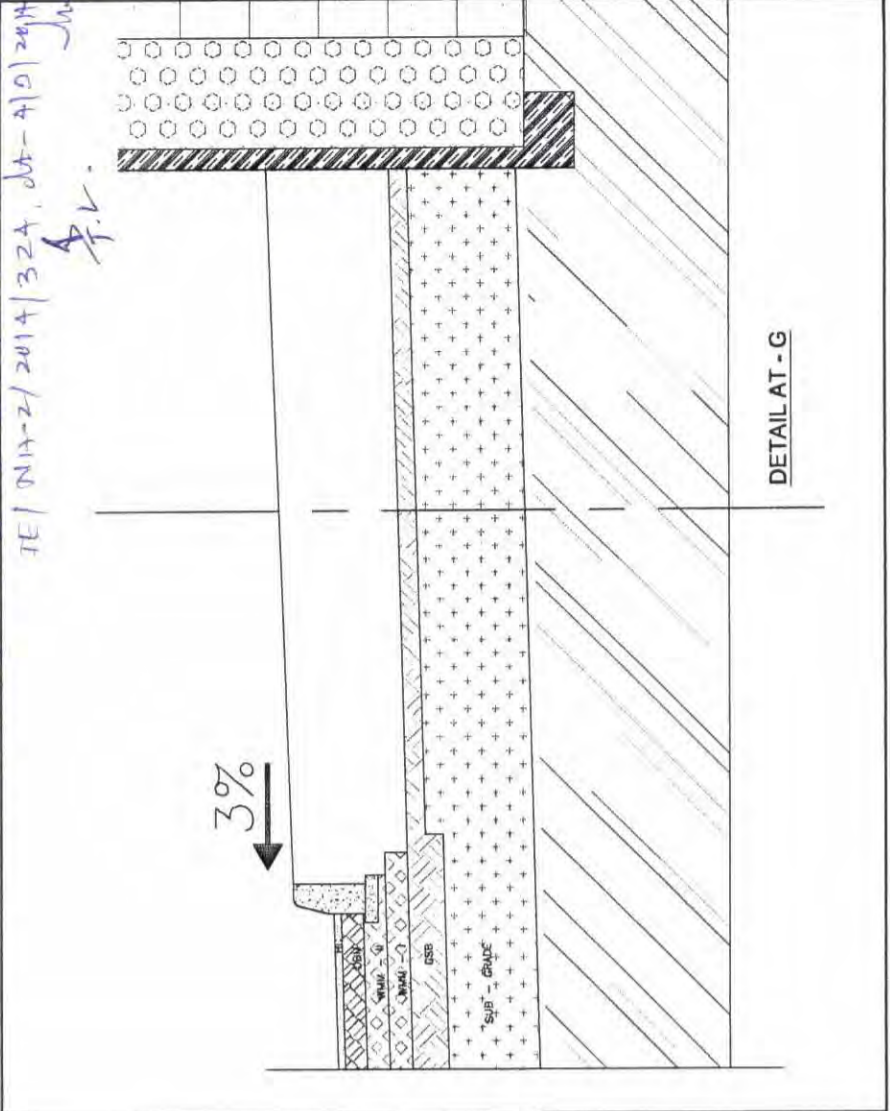
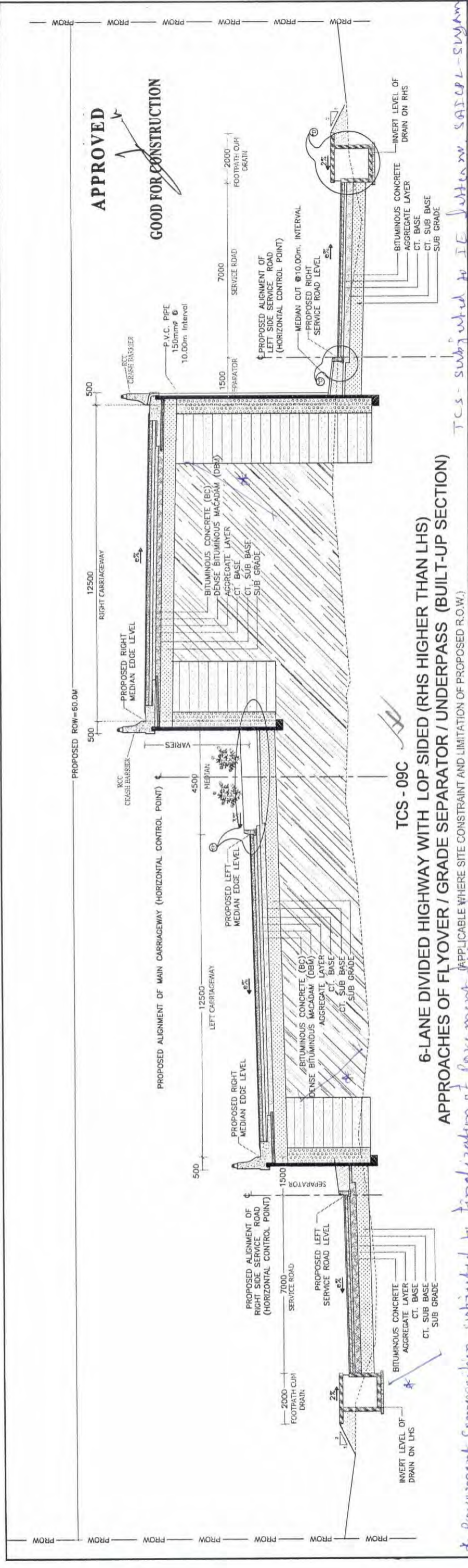
| | | | |
|------------------------------|--|--|--|
| GOOD FOR CONSTRUCTION | | GOOD FOR CONSTRUCTION | |
| REV. 01/2015 | REVISED AS PER COMMENTS FOR SUBMISSION | DATE 19/08/2014 | DESCRIPTION |
| DR. R. S. SINGH | DESIGNED BY : M.M. | DESIGNED BY : M.M. | DESIGNED BY : M.M. |
| DR. R. S. SINGH | CHECKED BY : A.M. | CHECKED BY : A.M. | CHECKED BY : A.M. |
| DR. R. S. SINGH | RECOMMENDED BY : A.R.M. Apte | RECOMMENDED BY : A.R.M. Apte | RECOMMENDED BY : A.R.M. Apte |
| DR. R. S. SINGH | APPROVED BY : H.R.B. | APPROVED BY : H.R.B. | APPROVED BY : H.R.B. |
| DR. R. S. SINGH | SCALE : | SCALE : | SCALE : |
| DR. R. S. SINGH | DRG. NO. : DND/ADV/1027-BAEL/2013/TCS/09BB | DRG. NO. : DND/ADV/1027-BAEL/2013/TCS/09BB | DRG. NO. : DND/ADV/1027-BAEL/2013/TCS/09BB |
| DR. R. S. SINGH | TITLE : TYPICAL CROSS SECTION TYPE - 09BB | TITLE : TYPICAL CROSS SECTION TYPE - 09BB | TITLE : TYPICAL CROSS SECTION TYPE - 09BB |
| DR. R. S. SINGH | REVISION : R1 | REVISION : R1 | REVISION : R1 |

DESIGN BY : IL&S Transportation
 IL&S Transportation Networks Limited

INDEPENDENT ENGINEER : S.A. Infrastructure Consultants Pvt. Ltd.
 S.A. Infrastructure Consultants Pvt. Ltd.
 CONVEYANCE : Barwa Adda Expressway Limited

PROJECT : Six-laning of Barwa-Adda-Panagarh Section of NH-2 from km 398.240 to km 521.120 including Panagarh Bypass in States of Jharkhand and West Bengal under NHDP Phase V on Toll on DBFOT Pattern

CLIENT : NATIONAL HIGHWAYS AUTHORITY OF INDIA



NOTES :-
 (1) FOR DETAILS OF PEDESTRIAN GUARD RAIL REFER TYPICAL DRAWING No.DNDA/ADV/1027-BAEL/2013/MISC/27
 (2) PROVIDE CONCRETE CRASH BARRIER IN MEDIAN WHEREVER MEDIAN WIDTH IS LESS THAN OR EQUAL TO 2.50m.

| | | | |
|------------------------------|--|--|------------------------|
| GOOD FOR CONSTRUCTION | | TITLE: TYPICAL CROSS SECTION TYPE - 09C | |
| DESIGNED BY : M.M. | CHECKED BY : A.M. | RECOMMENDED BY : A.R.M. Ajeeth | APPROVED BY : H.R.B. R |
| DATE: 05/01/2015 | REVISED AS PER COMMENTS FOR SUBMISSION | DRG. NO. : DNDA/ADV/1027-BAEL/2013/TCS/09C | REVISION : R1 |

DESIGN BY: **IL&FS Transportation**
 IL&FS Transportation Networks Limited

INDEPENDENT ENGINEER: **S.A. Infrastructure Consultants Pvt. Ltd.**
 10-101, 101-A, 101-B, 101-C, 101-D, 101-E, 101-F, 101-G, 101-H, 101-I, 101-J, 101-K, 101-L, 101-M, 101-N, 101-O, 101-P, 101-Q, 101-R, 101-S, 101-T, 101-U, 101-V, 101-W, 101-X, 101-Y, 101-Z, 101-AA, 101-AB, 101-AC, 101-AD, 101-AE, 101-AF, 101-AG, 101-AH, 101-AI, 101-AJ, 101-AL, 101-AM, 101-AN, 101-AO, 101-AP, 101-AQ, 101-AR, 101-AS, 101-AT, 101-AU, 101-AV, 101-AW, 101-AX, 101-AY, 101-AZ, 101-BA, 101-BB, 101-BC, 101-BD, 101-BE, 101-BF, 101-BG, 101-BH, 101-BI, 101-BJ, 101-BL, 101-BM, 101-BN, 101-BO, 101-BP, 101-BQ, 101-BR, 101-BS, 101-BT, 101-BU, 101-BV, 101-BW, 101-BX, 101-BY, 101-BZ, 101-CA, 101-CB, 101-CC, 101-CD, 101-CE, 101-CF, 101-CG, 101-CH, 101-CI, 101-CJ, 101-CL, 101-CM, 101-CN, 101-CO, 101-CP, 101-CQ, 101-CR, 101-CS, 101-CT, 101-CU, 101-CV, 101-CW, 101-CX, 101-CY, 101-CZ, 101-DA, 101-DB, 101-DC, 101-DD, 101-DE, 101-DF, 101-DG, 101-DH, 101-DI, 101-DJ, 101-DL, 101-DM, 101-DN, 101-DO, 101-DP, 101-DQ, 101-DR, 101-DS, 101-DT, 101-DU, 101-DV, 101-DW, 101-DX, 101-DY, 101-DZ, 101-EA, 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101-JD, 101-JE, 101-JF, 101-JG, 101-JH, 101-JI, 101-JJ, 101-JL, 101-JM, 101-JN, 101-JO, 101-JP, 101-JQ, 101-JR, 101-JS, 101-JT, 101-JU, 101-JV, 101-JW, 101-JX, 101-JY, 101-JZ, 101-KA, 101-KB, 101-KC, 101-KD, 101-KE, 101-KF, 101-KG, 101-KH, 101-KI, 101-KJ, 101-KL, 101-KM, 101-KN, 101-KO, 101-KP, 101-KQ, 101-KR, 101-KS, 101-KT, 101-KU, 101-KV, 101-KW, 101-KX, 101-KY, 101-KZ, 101-LA, 101-LB, 101-LC, 101-LD, 101-LE, 101-LF, 101-LG, 101-LH, 101-LI, 101-LJ, 101-LL, 101-LM, 101-LN, 101-LO, 101-LP, 101-LQ, 101-LR, 101-LS, 101-LT, 101-LU, 101-LV, 101-LW, 101-LX, 101-LY, 101-LZ, 101-MA, 101-MB, 101-MC, 101-MD, 101-ME, 101-MF, 101-MG, 101-MH, 101-MI, 101-MJ, 101-ML, 101-MN, 101-MO, 101-MP, 101-MQ, 101-MR, 101-MS, 101-MT, 101-MU, 101-MV, 101-MW, 101-MX, 101-MY, 101-MZ, 101-NA, 101-NB, 101-NC, 101-ND, 101-NE, 101-NF, 101-NG, 101-NH, 101-NI, 101-NJ, 101-NL, 101-NM, 101-NO, 101-NP, 101-NQ, 101-NR, 101-NS, 101-NT, 101-NU, 101-NV, 101-NW, 101-NX, 101-NY, 101-NZ, 101-OA, 101-OB, 101-OC, 101-OD, 101-OE, 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101-YD, 101-YE, 101-YF, 101-YG, 101-YH, 101-YI, 101-YJ, 101-YL, 101-YM, 101-YN, 101-YO, 101-YP, 101-YQ, 101-YR, 101-YS, 101-YT, 101-YU, 101-YV, 101-YW, 101-YY, 101-YZ, 101-ZA, 101-ZB, 101-ZC, 101-ZD, 101-ZE, 101-ZF, 101-ZG, 101-ZH, 101-ZI, 101-ZJ, 101-ZL, 101-ZM, 101-ZN, 101-ZO, 101-ZP, 101-ZQ, 101-ZR, 101-ZS, 101-ZT, 101-ZU, 101-ZV, 101-ZW, 101-ZX, 101-ZY, 101-ZZ

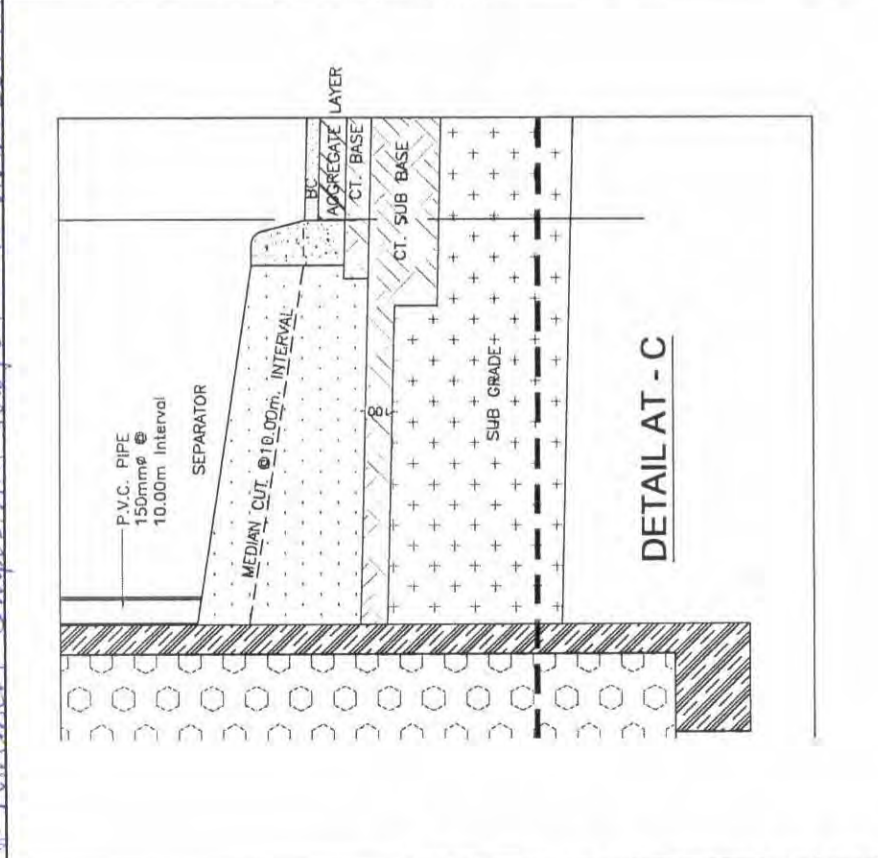
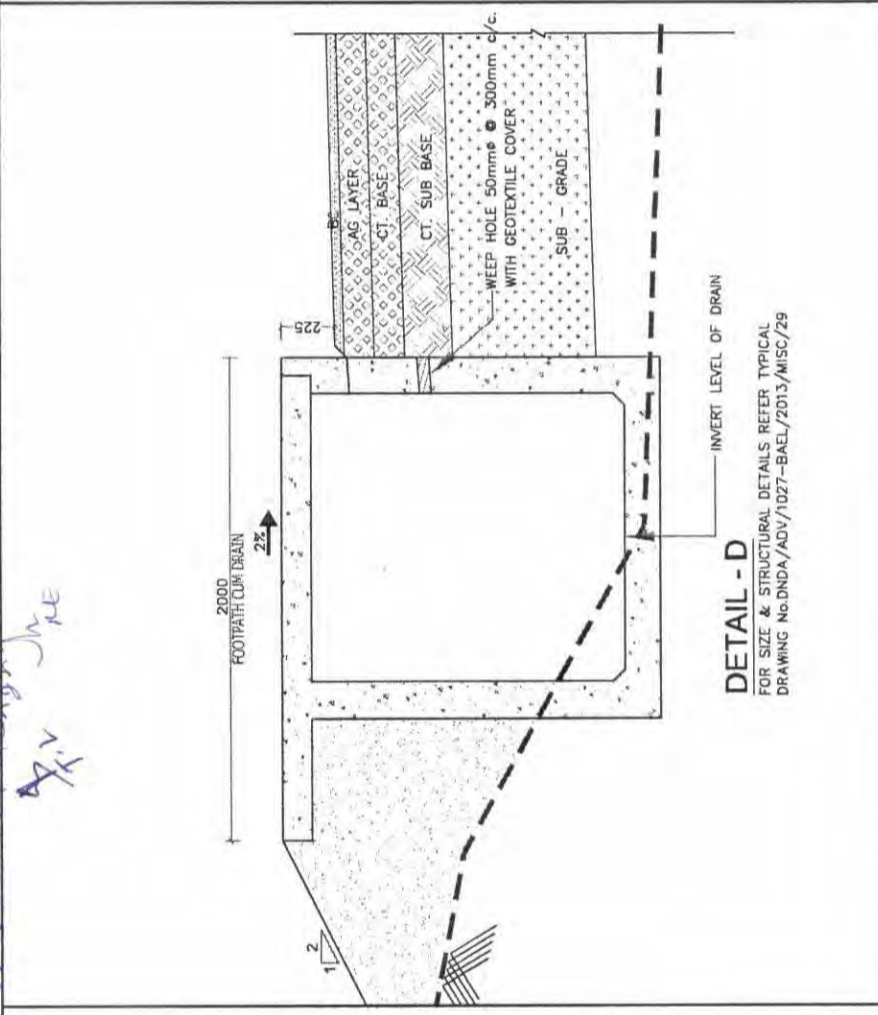
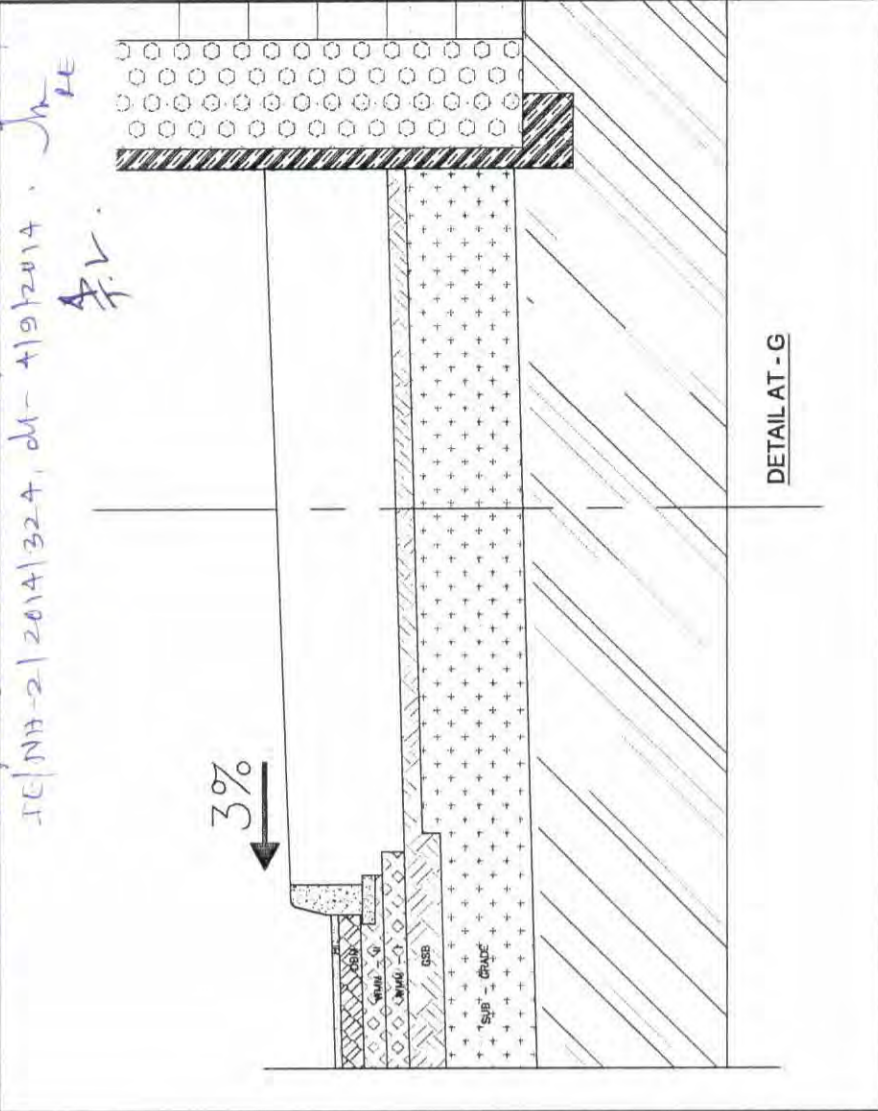
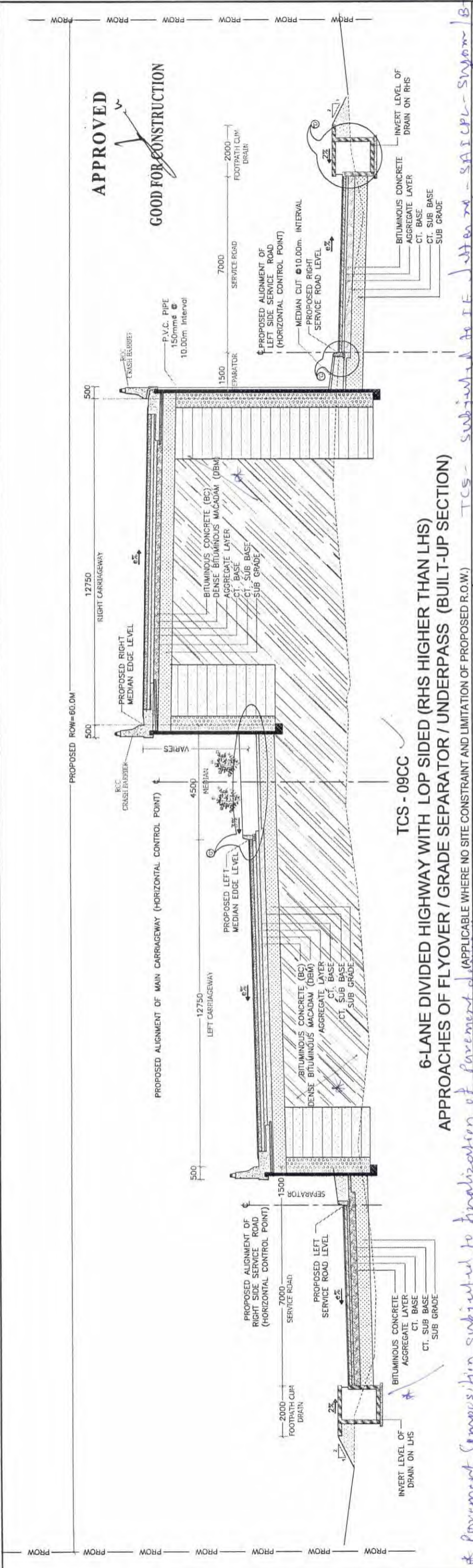
CLIENT: **NATIONAL HIGHWAYS AUTHORITY OF INDIA**

PROJECT: Six-laning of Barwa-Adda-Panagarh Section of NH-2 from km 398.240 to km 521.120 including Panagarh Bypass in States of Jharkhand and West Bengal under NHDP Phase V on Toll on DBFOT Pattern

TCS - submitted to I.E. Jutta on 20/11/2014. DT-4/01/2015
 TCS - submitted to I.E. Jutta on 20/11/2014. DT-4/01/2015
 TCS - submitted to I.E. Jutta on 20/11/2014. DT-4/01/2015

TCS - 09C
 6-LANE DIVIDED HIGHWAY WITH LOP SIDED (RHS HIGHER THAN LHS)
 APPROACHES OF FLYOVER / GRADE SEPARATOR / UNDERPASS (BUILT-UP SECTION)

APPROACHES OF FLYOVER / GRADE SEPARATOR / UNDERPASS (BUILT-UP SECTION)
 APPROACHES OF FLYOVER / GRADE SEPARATOR / UNDERPASS (BUILT-UP SECTION)
 APPROACHES OF FLYOVER / GRADE SEPARATOR / UNDERPASS (BUILT-UP SECTION)



APPROVED
GOOD FOR CONSTRUCTION

PROPOSED ROW = 60.0M

RIGHT CARRIAGEWAY
12750
PROPOSED RIGHT MEDIAN EDGE LEVEL
500
R.C. CRASH BARRIER
VARIES
4500
MEDIAN
PROPOSED LEFT MEDIAN EDGE LEVEL
12750
LEFT CARRIAGEWAY
1500
SEPARATOR
7000
SERVICE ROAD
PROPOSED RIGHT SIDE SERVICE ROAD (HORIZONTAL CONTROL POINT)
PROPOSED LEFT SERVICE ROAD LEVEL
25
INVERT LEVEL OF DRAIN ON LHS
BITUMINOUS CONCRETE
AGGREGATE LAYER
CT, SUB BASE
SUB GRADE

BITUMINOUS CONCRETE
DENSE BITUMINOUS MACADAM (DBM)
AGGREGATE LAYER
CT, SUB BASE
SUB GRADE

P.V.C. PIPE
150mm dia
10.00m Interval

PROPOSED ALIGNMENT OF LEFT SIDE SERVICE ROAD (HORIZONTAL CONTROL POINT)
MEDIAN CUT @ 10.00m INTERVAL
PROPOSED RIGHT SERVICE ROAD LEVEL
25
INVERT LEVEL OF DRAIN ON RHS
BITUMINOUS CONCRETE
AGGREGATE LAYER
CT, SUB BASE
SUB GRADE

PROPOSED ALIGNMENT OF RIGHT SIDE SERVICE ROAD (HORIZONTAL CONTROL POINT)
25
INVERT LEVEL OF DRAIN ON RHS
BITUMINOUS CONCRETE
AGGREGATE LAYER
CT, SUB BASE
SUB GRADE

2000
FOOTPATH CURB DRAIN
2%
WEEP HOLE 50mm dia @ 300mm c/c WITH GEOTEXTILE COVER
SUB GRADE

3%
DETAIL AT - G

TCS - 09CC

6-LANE DIVIDED HIGHWAY WITH LOP SIDED (RHS HIGHER THAN LHS) APPROACHES OF FLYOVER / GRADE SEPARATOR / UNDERPASS (BUILT-UP SECTION)

(APPLICABLE WHERE NO SITE CONSTRAINT AND LIMITATION OF PROPOSED R.O.W.)

TCS - subjected to I.E. Jutta on 20-08-2014 - SAICPL - Syam / B.A.P.
TCS - subjected to I.E. Jutta on 21-08-2014, dt - 19/02/2014. J.V. A.V.

DESIGN BY : I.C. Q.F.
DESIGNED BY : M.M. Q.F.
CHECKED BY : A.M. Q.F.
RECOMMENDED BY : A.R.M. Apple
APPROVED BY : H.R.B. Q.F.
SCALE :

GOOD FOR CONSTRUCTION

DESIGN BY : I.C. Q.F.
DESIGNED BY : M.M. Q.F.
CHECKED BY : A.M. Q.F.
RECOMMENDED BY : A.R.M. Apple
APPROVED BY : H.R.B. Q.F.
SCALE :

FOR SIZE & STRUCTURAL DETAILS REFER TYPICAL DRAWING No.DNDA/ADV/1027-BAEL/2013/MISC/29

INDEPENDENT ENGINEER :
S.A. Infrastructure Consultants Pvt. Ltd.
CONCESSIONAIRE :
Barwa Adda Expressway Limited

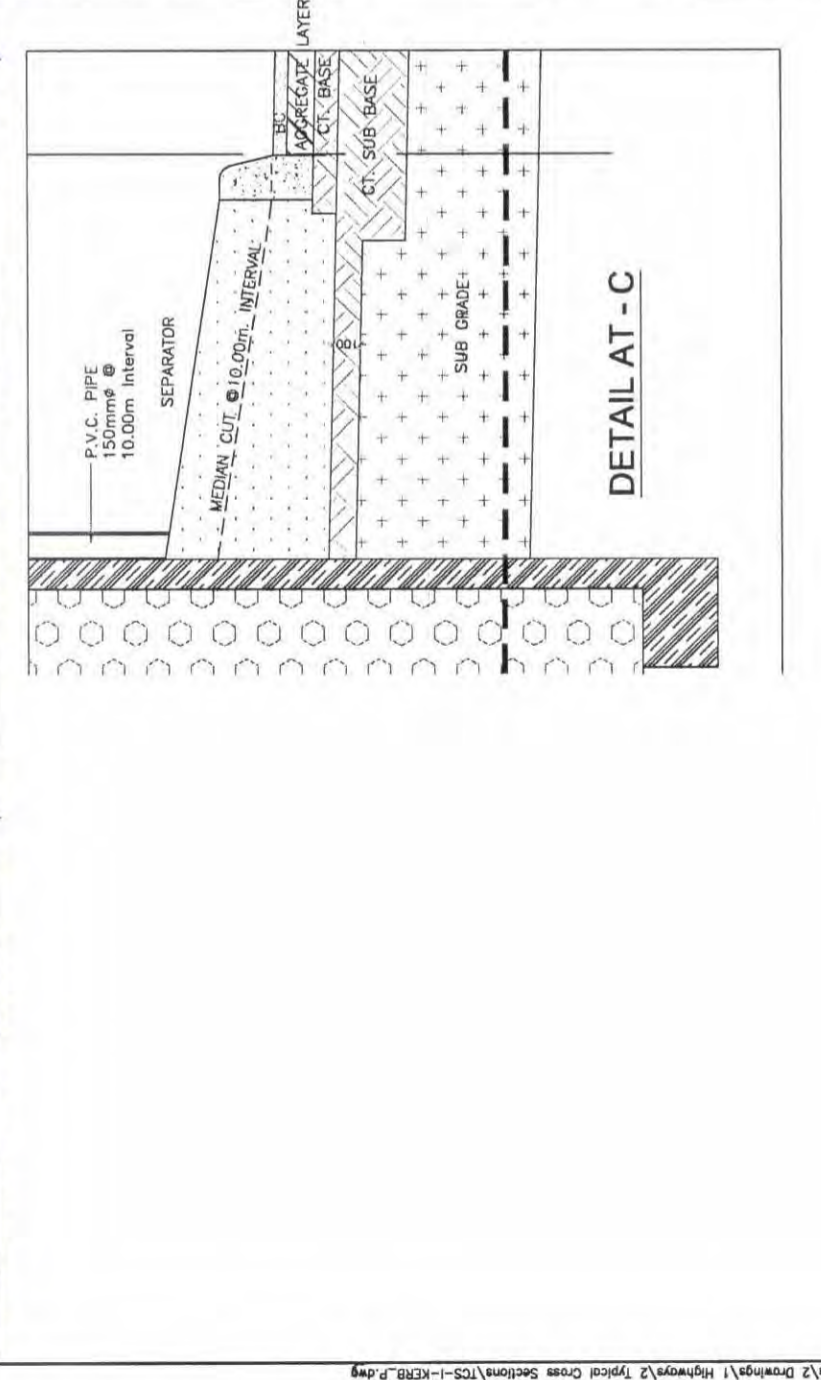
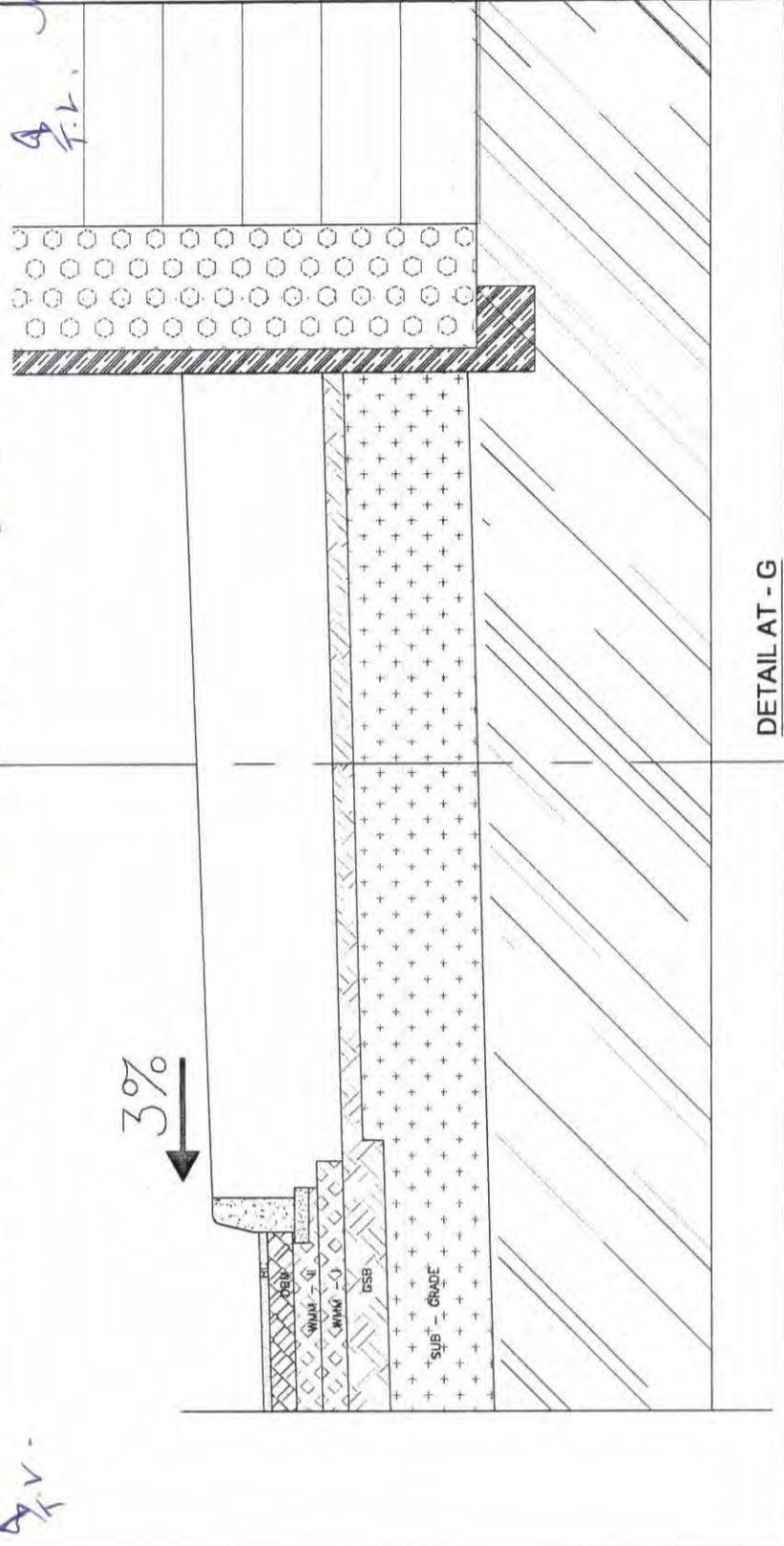
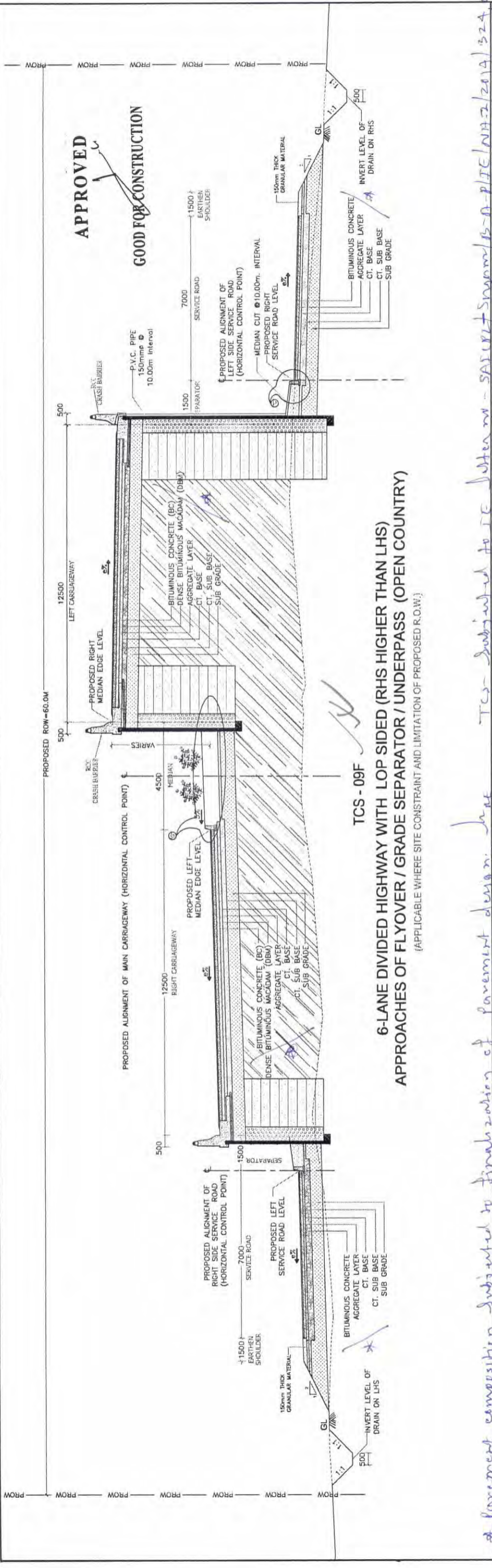
DESIGN BY :
IL&FS Transportation
IL&FS Transportation Networks Limited

CLIENT :
NATIONAL HIGHWAYS AUTHORITY OF INDIA

PROJECT :
Six-laning of Barwa-Adda-Panagarh Section of NH-2 from km 398.240 to km 521.120 including Panagarh Bypass in States of Jharkhand and West Bengal under NHDP Phase V on Toll on DBFOT Pattern

NOTES :-
(1) FOR DETAILS OF PEDESTRIAN GUARD RAIL REFER TYPICAL DRAWING No.DNDA/ADV/1027-BAEL/2013/MISC/27
(2) PROVIDE CONCRETE CRASH BARRIER IN MEDIAN WHEREVER MEDIAN WIDTH IS LESS THAN OR EQUAL TO 2.50m.

DATE: 08/01/2015 - 3:10pm
PATH: \\DATASRV\1027-Borwa\2 Drawings\2 Deliverables\2 Drawings\1 Highways\2 Typical Cross Sections\TCS-1-KERB_P.dwg



APPROVED
GOOD FOR CONSTRUCTION

TCS - 09F
6-LANE DIVIDED HIGHWAY WITH LOP SIDED (RHS HIGHER THAN LHS) APPROACHES OF FLYOVER / GRADE SEPARATOR / UNDERPASS (OPEN COUNTRY)
(APPLICABLE WHERE SITE CONSTRAINT AND LIMITATION OF PROPOSED R.O.W.)

DETAIL AT - G

DETAIL AT - C

3%

DESIGN BY : IIL&S Transportation
IIL&S Transportation Networks Limited

INDEPENDENT ENGINEER : SA Infrastructure Consultants Pvt. Ltd.
CONGRESSORNAIRE : Barwa Adda Expressway Limited

PROJECT : Six-laning of Barwa-Adda-Panagath Section of NH-2 from km 398.240 to km 521.420 including Panagath Bypass in States of Jharkhand and West Bengal under NHDP Phase V on Toll on DBFOT Pattern

CLIENT : NATIONAL HIGHWAYS AUTHORITY OF INDIA

NOTES :-
(1) FOR DETAILS OF PEDESTRIAN GUARD RAIL REFER TYPICAL DRAWING No.DNDA/ADV/1027-BAEL/2013/MISC/27
(2) PROVIDE CONCRETE CRASH BARRIER IN MEDIAN WHEREVER MEDIAN WIDTH IS LESS THAN OR EQUAL TO 2.50m.

GOOD FOR CONSTRUCTION

TITLE : TYPICAL CROSS SECTION TYPE - 09F

DRAWN BY : L.C. **DESIGNED BY :** M.M. **CHECKED BY :** A.M. **RECOMMENDED BY :** A.R.M. **APPROVED BY :** H.R.B.

DATE : 05/01/2015 **REVISIONS :** R1 27/01/2014

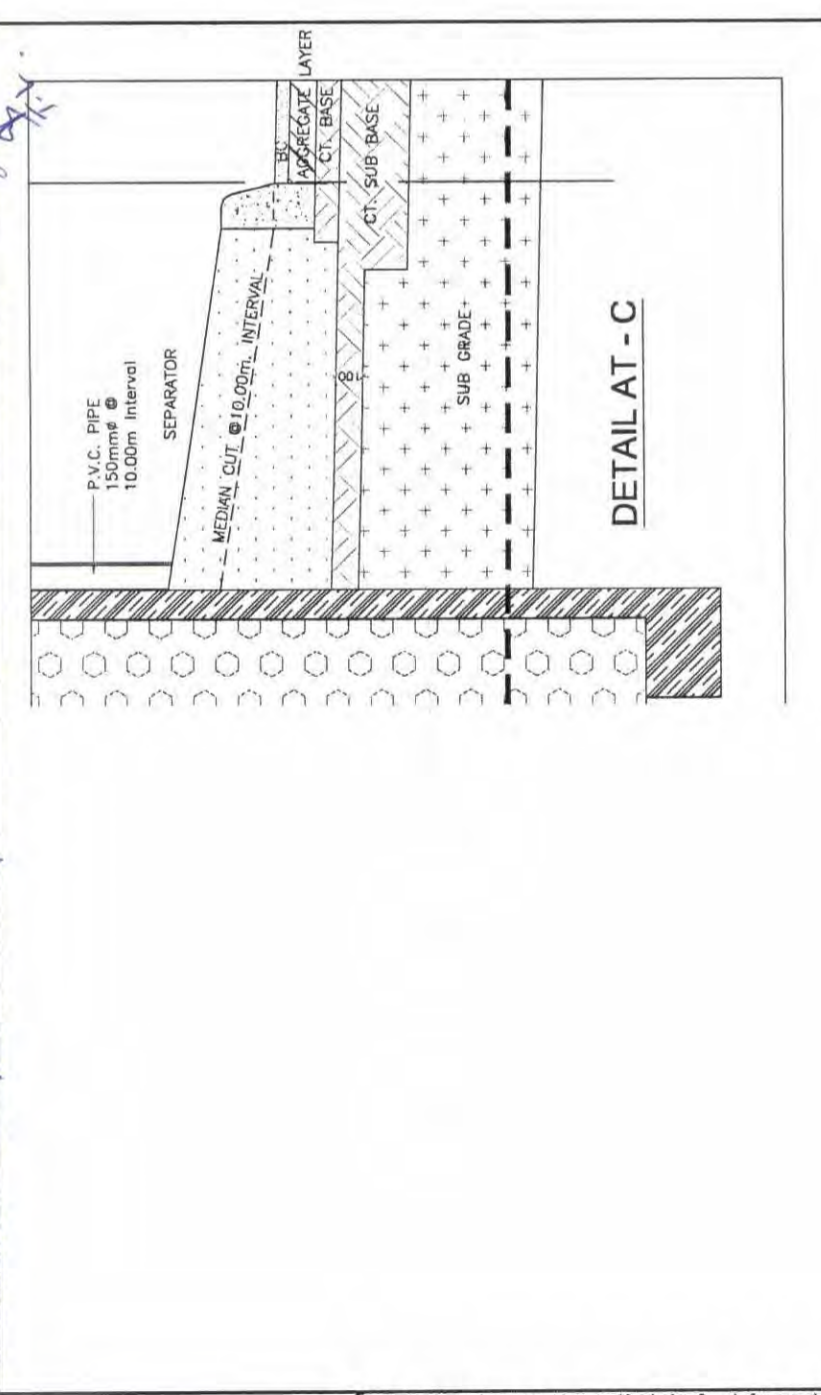
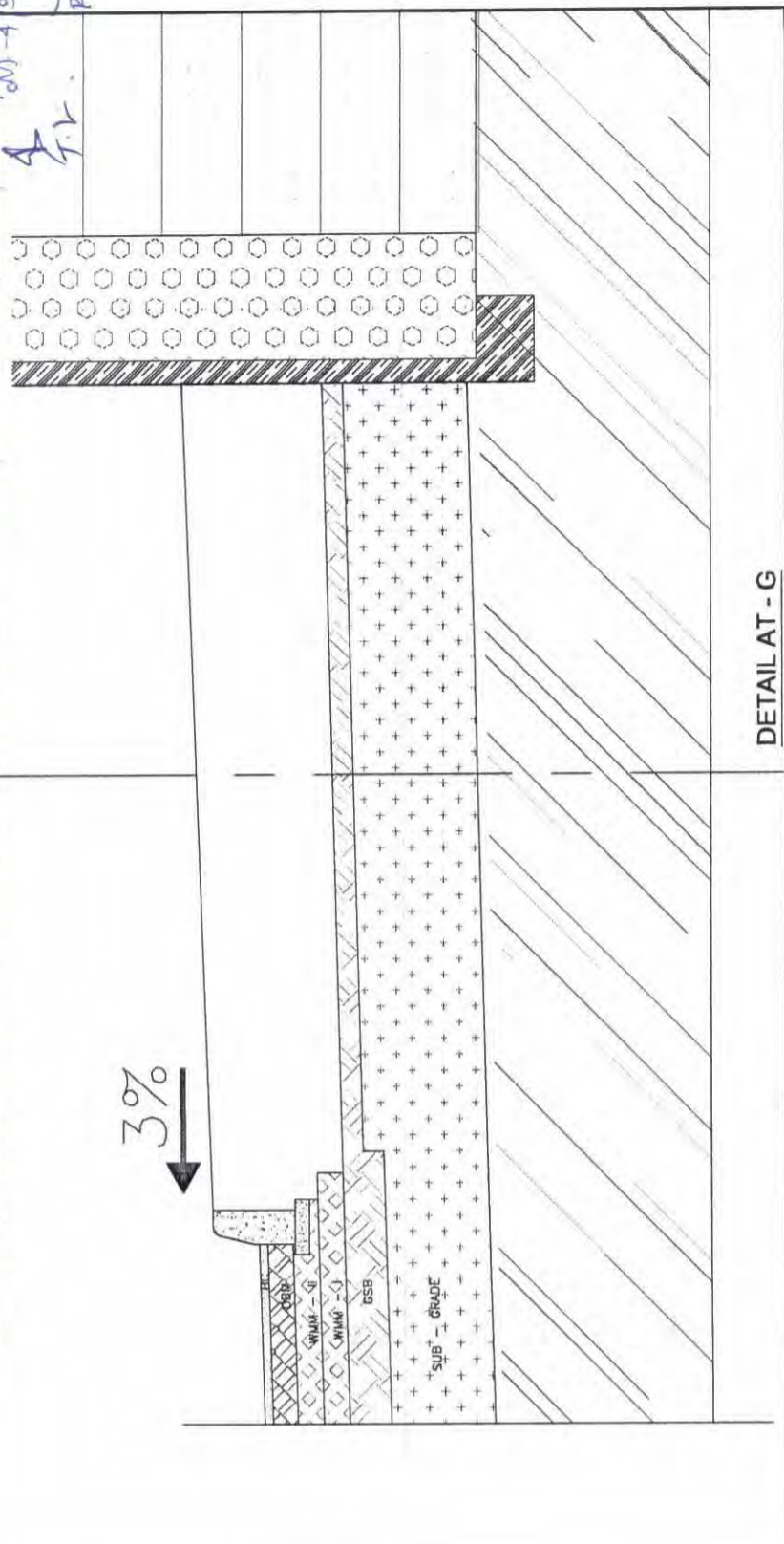
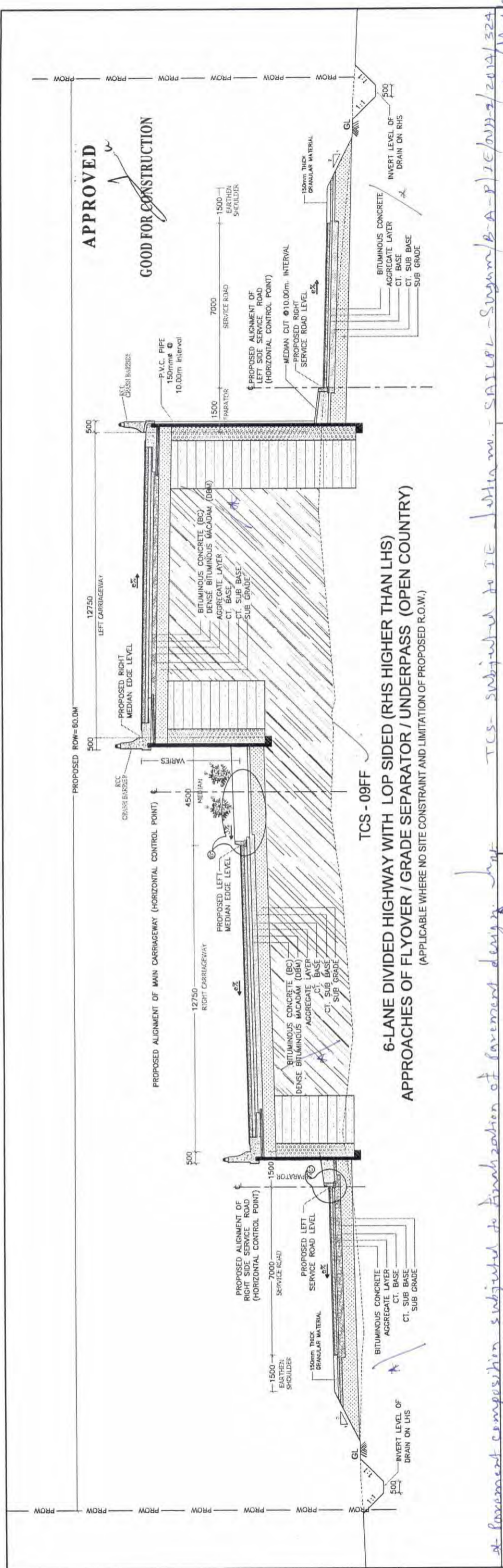
DESCRIPTION : REVISED AS PER COMMENTS FOR SUBMISSION

SCALE : R1

DRG. NO. : DNDA/ADV/1027-BAEL/2013/TCS/09F

REVISION : R1

Handwritten notes:
 Pavement composition subjected to finalization of pavement design. *See*
 TCS submitted to I.E. letter no. - SA/IL&S/1501/15/24/10/14
 A.V.
 9.1.1.
 J.R.E.



APPROVED
GOOD FOR CONSTRUCTION

TCS - 09FF

6-LANE DIVIDED HIGHWAY WITH LOP SIDED (RHS HIGHER THAN LHS) APPROACHES OF FLYOVER / GRADE SEPARATOR / UNDERPASS (OPEN COUNTRY)
(APPLICABLE WHERE NO SITE CONSTRAINT AND LIMITATION OF PROPOSED R.O.W.)

at pavement composition subjected to finalization of pavement design by TCS- submitted to I.E. Jutta m. - SAIRL - Sanyam/B-A-PIE/0112/2014/324 M-4 9/14

DETAIL AT - C

DETAIL AT - G

GOOD FOR CONSTRUCTION

DESIGN BY : IIL&S Transportation
IIL&S Transportation Networks Limited

INDEPENDENT ENGINEER : Barwa Adda Expressway Limited

PROJECT : Six-laning of Barwa-Adda-Panagarh Section of NH-2 from km 398.240 to km 521.120 including Panagarh Bypass in States of Jharkhand and West Bengal under NHDP Phase V on Toll on DBFOT Pattern

CLIENT : NATIONAL HIGHWAYS AUTHORITY OF INDIA

NOTES :-
(1) FOR DETAILS OF PEDESTRIAN GUARD RAIL REFER TYPICAL DRAWING No.DNDA/ADV/1027-BAEL/2013/MISC/27
(2) PROVIDE CONCRETE CRASH BARRIER IN MEDIAN WHEREVER MEDIAN WIDTH IS LESS THAN OR EQUAL TO 2.50m.

| | | |
|---------|-----------------|--|
| REV. R1 | DATE 05/01/2015 | DESCRIPTION AS PER COMMENTS FOR SUBMISSION |
| REV. R0 | DATE 19/06/2014 | DESCRIPTION |

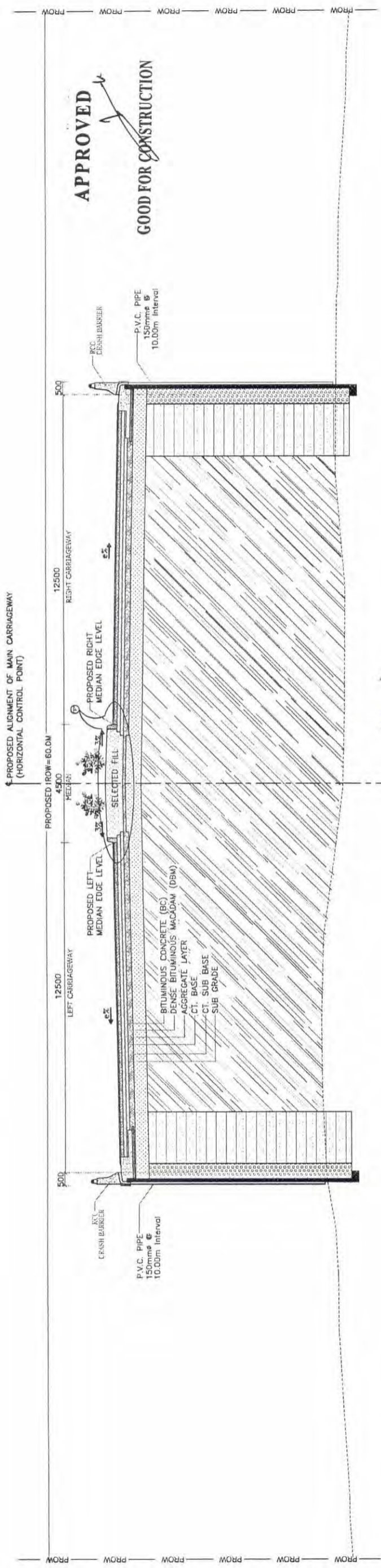
TITLE : TYPICAL CROSS SECTION TYPE - 09FF

DRG. NO. : DNDA/ADV/1027-BAEL/2013/TCS/09FF

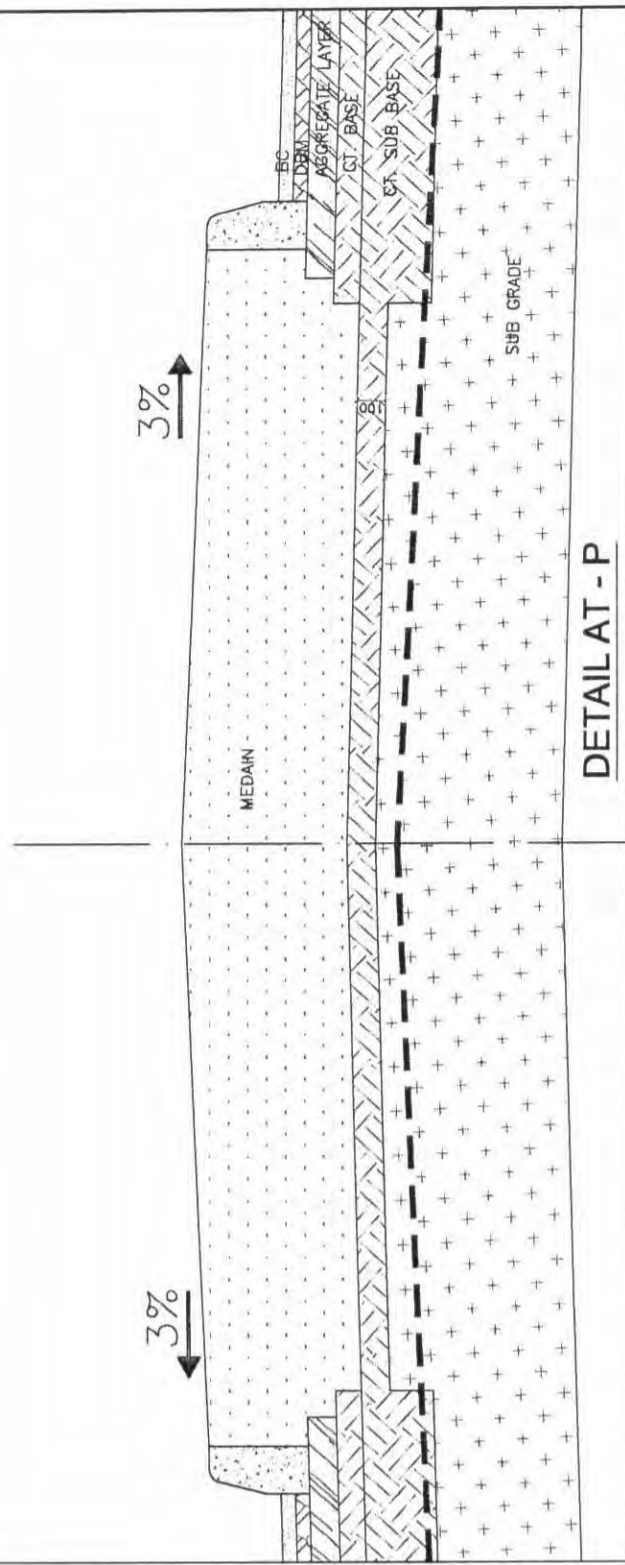
REVISION : R1

SCALE :

DESIGNED BY : M.M.
CHECKED BY : A.M.
RECOMMENDED BY : A.R.M. Aggarwal
APPROVED BY : H.R.B.



TCS - 09G
6-LANE DIVIDED HIGHWAY WITH FLYOVER / GRADE SEPARATOR / UNDERPASS / ROB APPROACHES (OPEN COUNTRY)
 (APPLICABLE WHERE SITE CONSTRAINT AND LIMITATION OF PROPOSED R.O.W.)



NOTES :-
 (1) FOR DETAILS OF PEDESTRIAN GUARD RAIL REFER TYPICAL DRAWING No.DNDA/ADV/1027-BAEL/2013/MISC/27
 (2) PROVIDE CONCRETE CRASH BARRIER IN MEDIAN WHEREVER MEDIAN WIDTH IS LESS THAN OR EQUAL TO 2.50m.

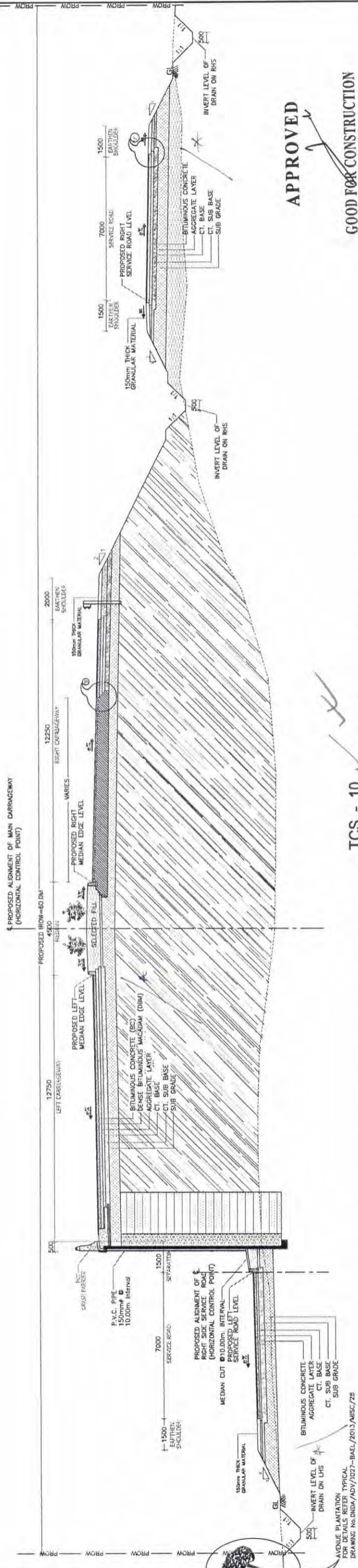
| | | | |
|------------------------------|------------|--|--|
| GOOD FOR CONSTRUCTION | | DRAWN BY : L.C. <i>LC</i> DESIGNED BY : M.M. <i>MM</i> CHECKED BY : A.M. <i>AM</i> RECOMMENDED BY : A.R.M. <i>ARM</i> APPROVED BY : H.R.B. <i>HRB</i> SCALE : | TITLE : TYPICAL CROSS SECTION TYPE - 09G |
| R1 | 05/01/2015 | REVISED AS PER COMMENTS FOR SUBMISSION | DRG. NO. : DNDA/ADV/1027-BAEL/2013/TCS/09G |
| R2 | 20/10/2014 | | |
| REV. | DATE | DESCRIPTION | REVISION : R1 |

DESIGN BY : **IIL&S Transportation**
 IIL&S Transportation Networks Limited

INDEPENDENT ENGINEER : **S.A. Infrastructure Consultants Pvt. Ltd.**
 CONCESSIONAIRE : **Barwa Adda Expressway Limited**

PROJECT : Six-laning of Barwa-Adda-Panagarh Section of NH-2 from km 398.240 to km 521.420 including Panagarh Bypass in States of Jharkhand and West Bengal under NHDP Phase V on Toll on DBFOT Pattern

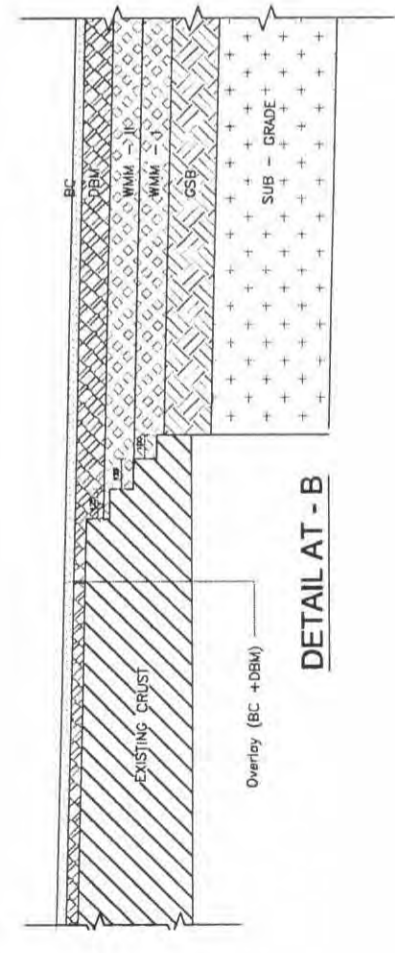
CLIENT : **NATIONAL HIGHWAYS AUTHORITY OF INDIA**



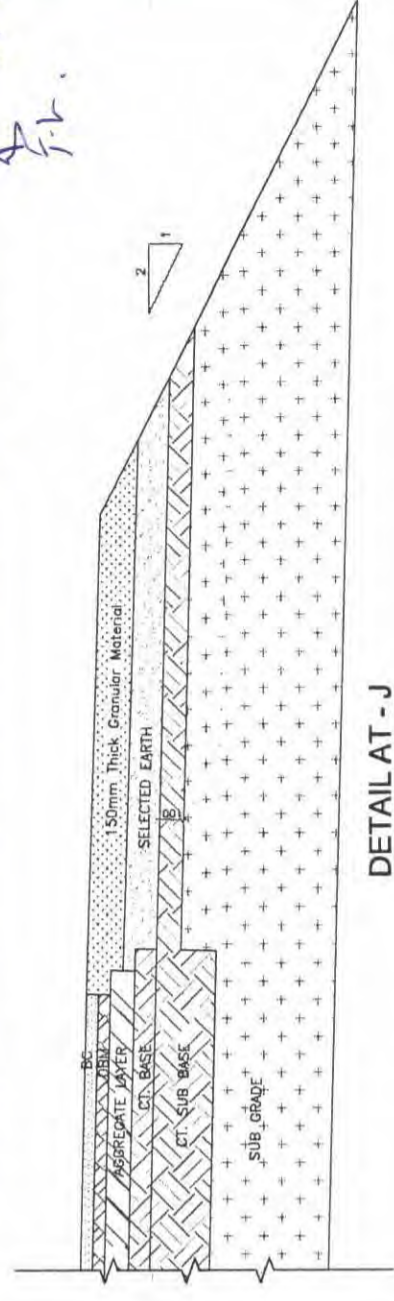
TCS - 10
 6-LANE DIVIDED HIGHWAY WITH ELEVATED R.O.B. APPROACHES AND WITH BOTH SIDE SERVICE ROADS

* Pavement Composition subjected to finalization of Pavement design. J.A.P.E

TCS- Sub-jointed to IE Letter no - SAICPL-Surgam/13-A-P/IE/118-2/2014/206
 dt-30/09/2014
 J.A.P.E



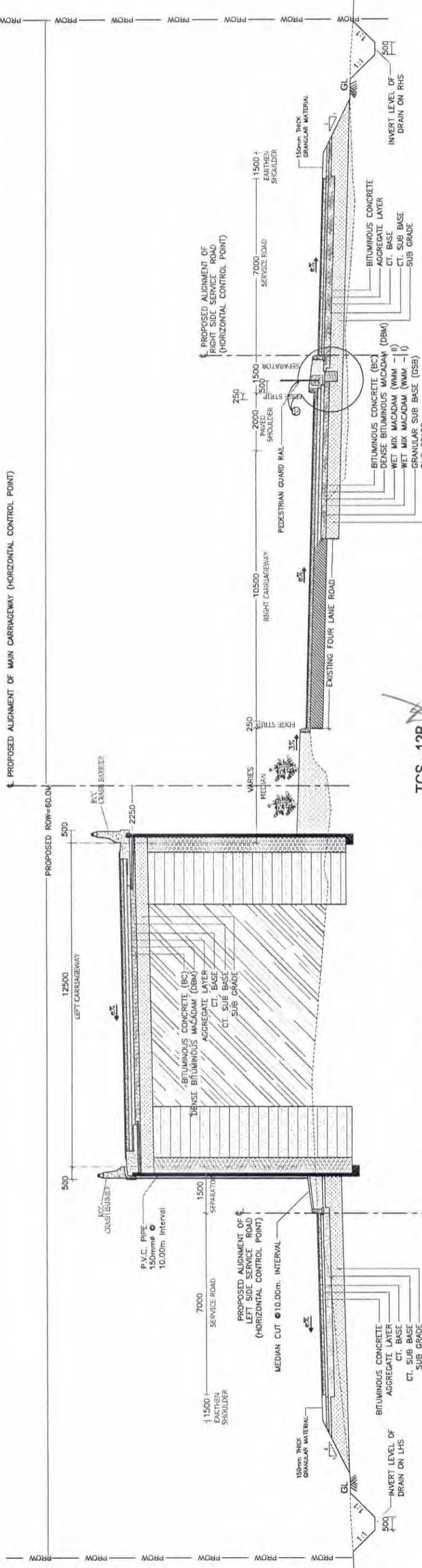
DETAIL AT - B



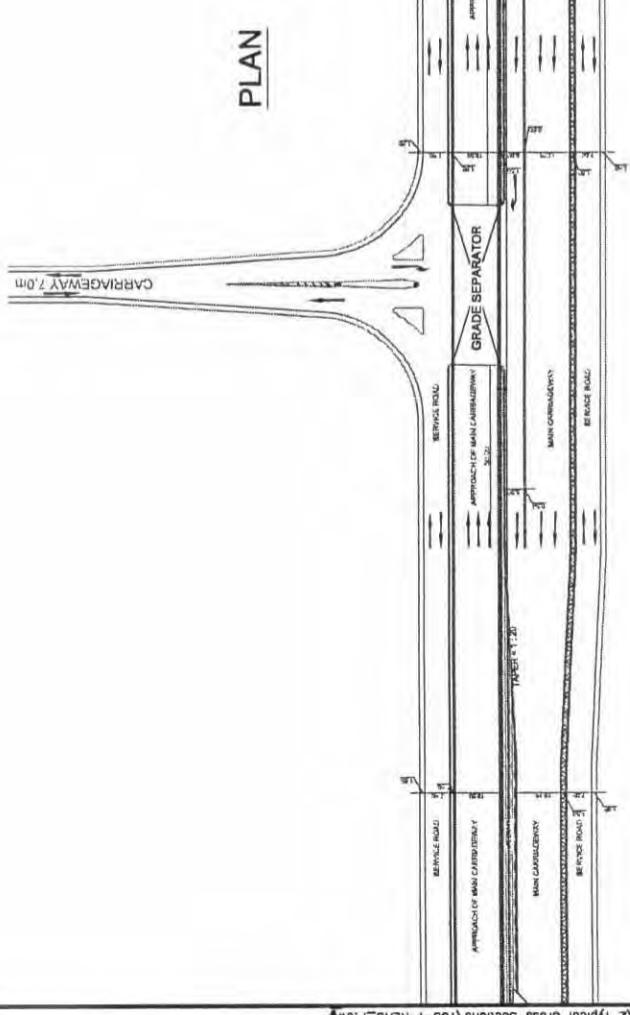
DETAIL AT - J

NOTES :-
 (1) FOR DETAILS OF PEDESTRIAN GUARD RAIL REFER TYPICAL DRAWING No.DNDA/ADV/1027-BAEL/2013/MISC/27
 (2) PROVIDE CONCRETE CRASH BARRIER IN MEDIAN WHEREVER MEDIAN WIDTH IS LESS THAN OR EQUAL TO 2.50m.

| | | | | | |
|---|---|---|---|---|---|
| CLIENT: NATIONAL HIGHWAYS AUTHORITY OF INDIA | PROJECT: Six-laning of Barwa-Adda-Panagarh Section of NH-2 from km 398.240 to km 521.120 including Panagarh Bypass in States of Jharkhand and West Bengal under NHDP Phase V on Toll on DBFOT Pattern | INDEPENDENT ENGINEER: Sri Infrastructure Consultants Pvt. Ltd. 10/1, Park Road, Sector 10, Gurgaon, Haryana-122001 CONSIGNAIRE: Barwa-Adda Expressway Limited | DESIGN BY: IL&FS Transportation IL&FS Transportation Networks Limited | GOOD FOR CONSTRUCTION | GOOD FOR CONSTRUCTION |
| | | | | REV. DATE DESCRIPTION R2 05/07/2015 REVISED AS PER E COMMENTS R1 14/10/2014 REVISED AS PER E COMMENTS R0 27/01/2014 FOR SUBMISSION | TITLE: TYPICAL CROSS SECTION TYPE - 10 |
| APPROVED GOOD FOR CONSTRUCTION | | DRWN BY : I.C. DESIGNED BY : M.M. CHECKED BY : A.M. RECOMMENDED BY : A.R.M. APPROVED BY : H.R.B. | | DRG. NO.: DNDA/ADV/1027-BAEL/2013/TCS/10 REVISION : R2 | |

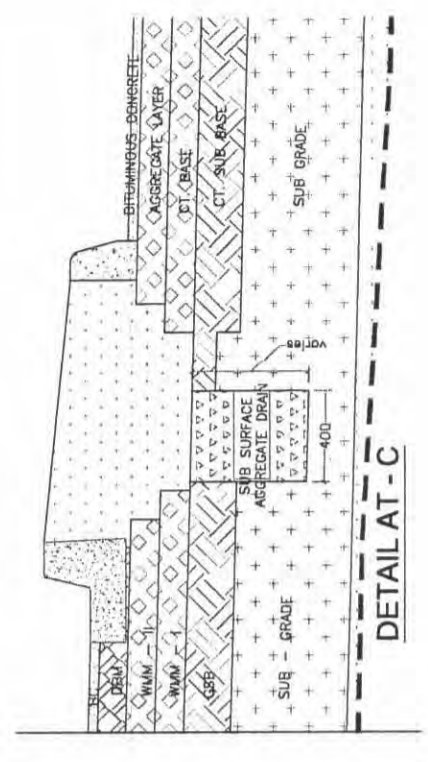


6-LANE DIVIDED HIGHWAY WITH LEFT SIDE (UNI DIRECTIONAL) GRADE SEPARATOR APPROACH WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY)
 (APPLICABLE WHERE SITE CONSTRAINT AND LIMITATION OF PROPOSED R.O.W.)



PLAN

APPROVED
GOOD FOR CONSTRUCTION

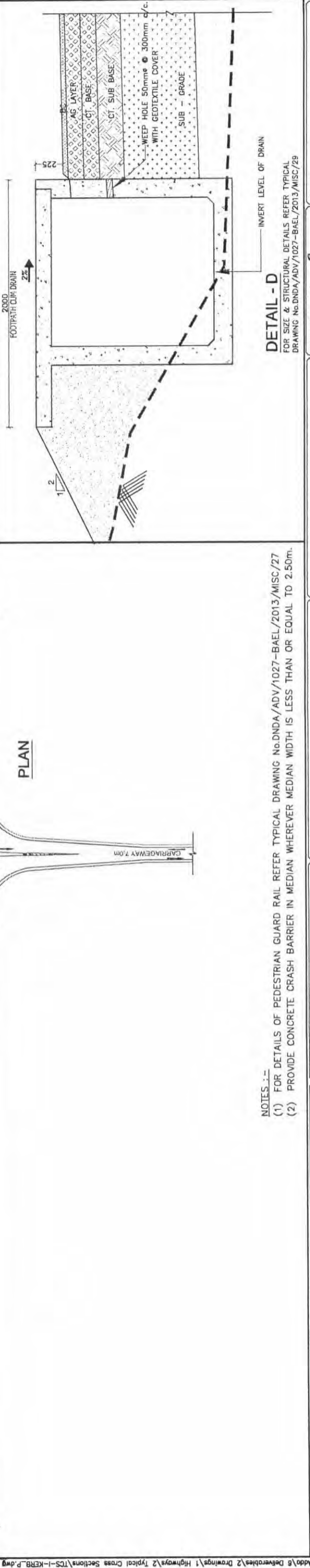
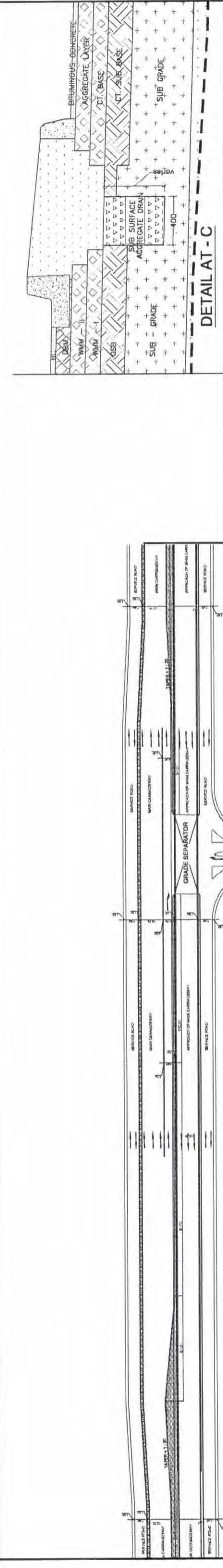
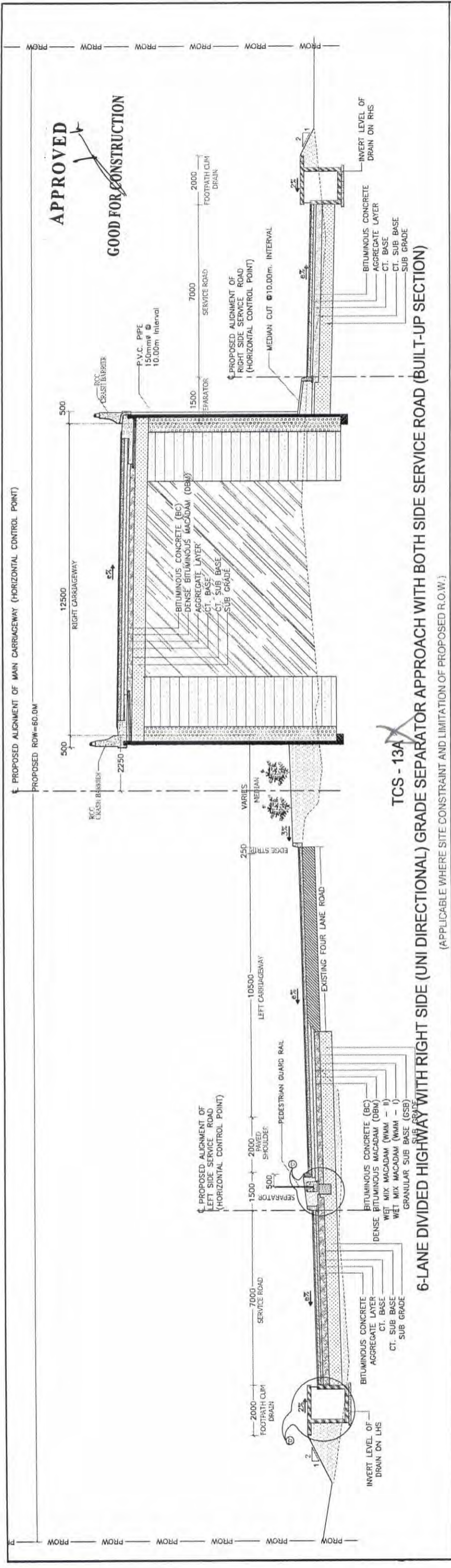


DETAIL AT - C

NOTES :-
 (1) FOR DETAILS OF PEDESTRIAN GUARD RAIL REFER TYPICAL DRAWING No.DNDA/ADV/1027-BAEL/2013/MISC/27
 (2) PROVIDE CONCRETE CRASH BARRIER IN MEDIAN WHEREVER MEDIAN WIDTH IS LESS THAN OR EQUAL TO 2.50m.

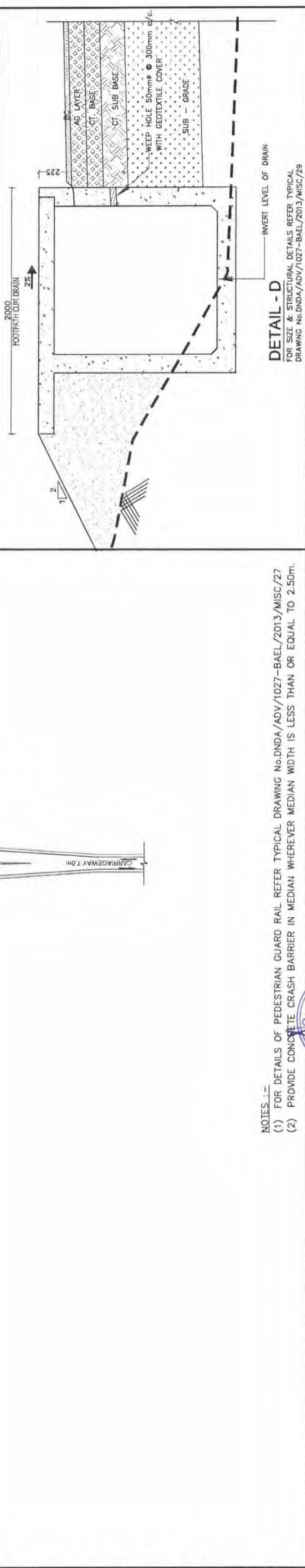
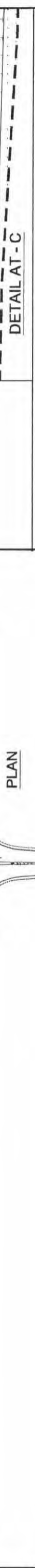
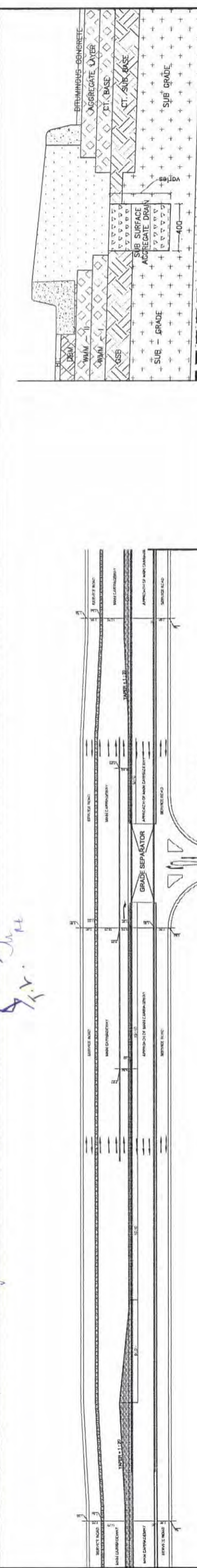
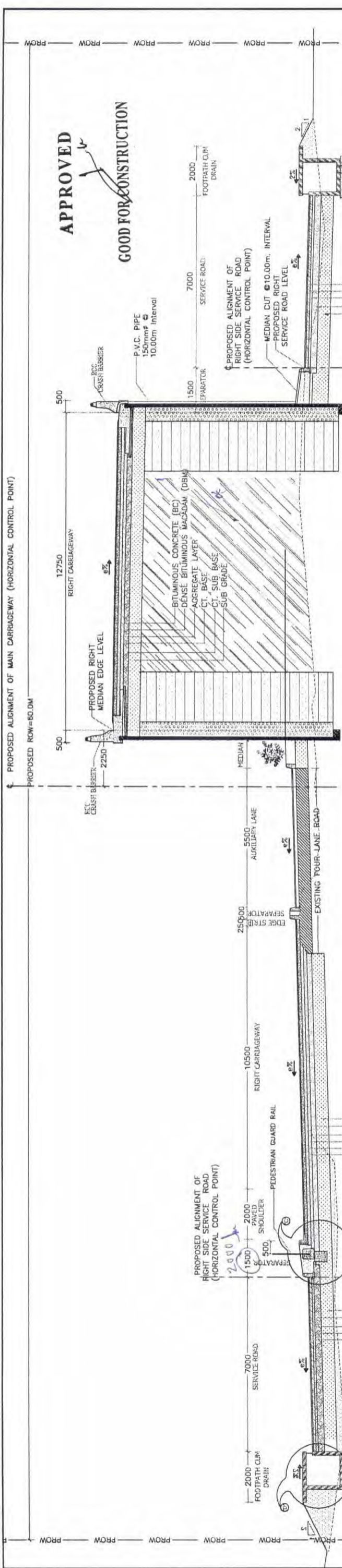
| | | | | | |
|---------------------|--|---|------------------------------|--------------------------------|---|
| CLIENT : | PROJECT : Six-laning of Barwa-Adda-Panagarh Section of NH-2 from km 398.240 to km 521.120 including Panagarh Bypass in States of Jharkhand and West Bengal under NHDP Phase V on Toll on DBFOT Pattern | DESIGN BY : IL&FS Transportation IL&FS Transportation Networks Limited | GOOD FOR CONSTRUCTION | DRAWN BY : I.C. | TITLE : TYPICAL CROSS SECTION TYPE - 12B |
| | | | | DESIGNED BY : M.M. | DRG. NO. : DNDA/ADV/1027-BAEL/2013/TCS/12B |
| | | | | CHECKED BY : A.M. | REVISION : R1 |
| | | | | RECOMMENDED BY : A.R.M. | SCALE : |
| | | | | APPROVED BY : H.R.B. | REVISION : R1 |

DATE: 08/01/2015 - 2:12pm
 PATH: \\DATA\SRV\1027\Borwa\06\Deliverables\2 Drawings\1 Highway\2 Typical Cross Sections\TCS-1-KERB_P.dwg



NOTES :-
(1) FOR DETAILS OF PEDESTRIAN GUARD RAIL REFER TYPICAL DRAWING No.DNDA/ADV/1027-BAEL/2013/MISC/27
(2) PROVIDE CONCRETE CRASH BARRIER IN MEDIAN WHEREVER MEDIAN WIDTH IS LESS THAN OR EQUAL TO 2.50m.

| | | | | | | | |
|---|--|---|-------------------------------------|-----------------------------------|-------------------------------------|---|--|
| <p>CLIENT: NATIONAL HIGHWAYS AUTHORITY OF INDIA</p> | <p>PROJECT: Six-laning of Barwa-Adda-Panagarh Section of NH-2 from km 396.240 to km 521.120 including Panagarh Bypass in States of Jharkhand and West Bengal under NHDPP Phase V on Toll on DBFOT Pattern</p> | <p>DESIGN BY: IL&FS Transportation IL&FS Transportation Networks Limited</p> | <p>GOOD FOR CONSTRUCTION</p> | <p>DESIGNED BY: M.M.</p> | <p>GOOD FOR CONSTRUCTION</p> | <p>DESIGNED BY: I.C.</p> | <p>TYPICAL CROSS SECTION TYPE - 13A</p> |
| | | | | <p>CHECKED BY: A.M.</p> | | <p>DRAWN BY: I.C.</p> | |
| <p>CONCESSIONAIRE: Barwa Adda Expressway Limited</p> | | <p>RECOMMENDED BY: I.A.R.M. Aggarwal</p> | | <p>APPROVED BY: H.R.B.</p> | | <p>DRG. NO.: DNDA/ADV/1027-BAEL/2013/TCS/13A</p> | |
| <p>INDEPENDENT ENGINEER: S.A. Infrastructure Consultants Pvt. Ltd. 10-102, Old, Gayan Road Indraprastha, Distt. Gurgaon-201301</p> | | <p>REVISION AS PER COMMENTS FOR SUBMISSION</p> | | <p>SCALE:</p> | | <p>REVISION: R1</p> | |



APPROVED
GOOD FOR CONSTRUCTION

TCS - 13AA

6-LANE DIVIDED HIGHWAY WITH RIGHT SIDE (UNI DIRECTIONAL) GRADE SEPARATOR APPROACH WITH BOTH SIDE SERVICE ROAD (BUILT-UP SECTION)

Handwritten note: Pavement construction is suggested to be finalized by Government Design (APPLICABLE WHERE NO SITE CONSTRAINT AND LIMITATION OF PROPOSED R.O.W.)

DETAIL AT - C

DETAIL - D

PLAN

NOTES :-

- FOR DETAILS OF PEDESTRIAN GUARD RAIL REFER TYPICAL DRAWING No.DNDA/ADV/1027-BAEL/2013/MISC/27
- PROVIDE CONCRETE CRASH BARRIER IN MEDIAN WHEREVER MEDIAN WIDTH IS LESS THAN OR EQUAL TO 2.50m.

| | | | |
|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| GOOD FOR CONSTRUCTION | | GOOD FOR CONSTRUCTION | |
| DESIGNED BY : M.M. | DESIGNED BY : L.C. | DESIGNED BY : M.M. | DESIGNED BY : L.C. |
| CHECKED BY : A.M. | CHECKED BY : A.M. | CHECKED BY : A.M. | CHECKED BY : A.M. |
| RECOMMENDED BY : A.R.M. Agble | RECOMMENDED BY : A.R.M. Agble | RECOMMENDED BY : A.R.M. Agble | RECOMMENDED BY : A.R.M. Agble |
| APPROVED BY : H.R.B. | APPROVED BY : H.R.B. | APPROVED BY : H.R.B. | APPROVED BY : H.R.B. |
| SCALE : | SCALE : | SCALE : | SCALE : |
| REV. DATE DESCRIPTION | REV. DATE DESCRIPTION | REV. DATE DESCRIPTION | REV. DATE DESCRIPTION |
| R1 05/01/2015 | R1 05/01/2015 | R1 05/01/2015 | R1 05/01/2015 |
| R2 19/06/2014 | R2 19/06/2014 | R2 19/06/2014 | R2 19/06/2014 |
| REV. DATE DESCRIPTION | REV. DATE DESCRIPTION | REV. DATE DESCRIPTION | REV. DATE DESCRIPTION |
| REV. DATE DESCRIPTION | REV. DATE DESCRIPTION | REV. DATE DESCRIPTION | REV. DATE DESCRIPTION |

CLIENT : NATIONAL HIGHWAYS AUTHORITY OF INDIA

PROJECT : Six-laning of Barwa-Adda-Panagarh Section of NH-2 from km 398.240 to km 521.120 including Panagarh Bypass in States of Jharkhand and West Bengal under NHDPP Phase V on Toll on DBFOT Pattern

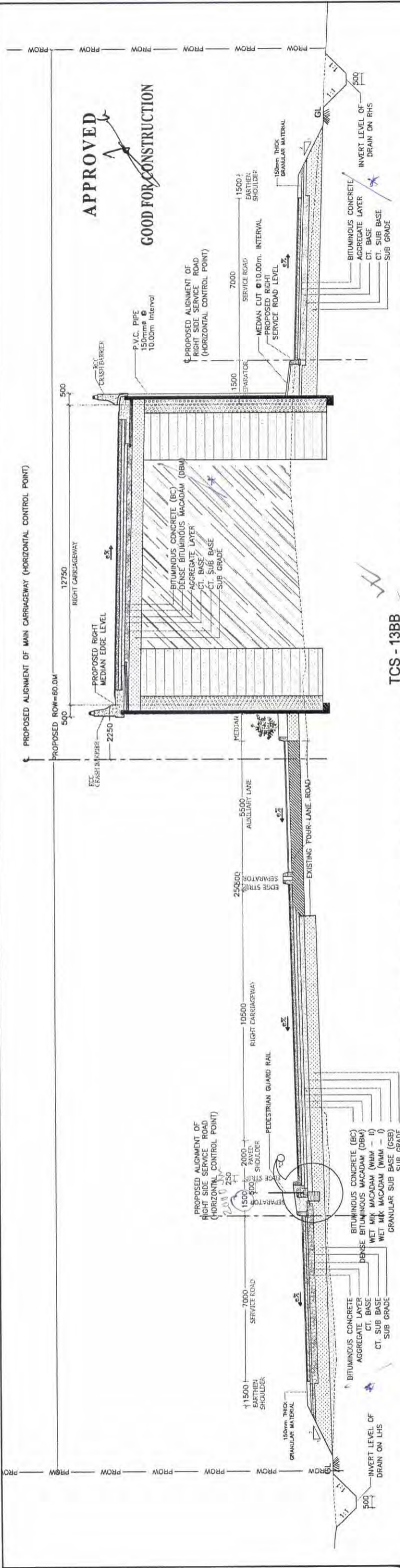
DESIGN BY : IIL&S Transportation
IIL&S Transportation Networks Limited

INDEPENDENT ENGINEER : S.A. Infrastructure Consultants Pvt. Ltd.
S.A. Infrastructure Consultants Pvt. Ltd.
CONCESSIONAIRE : Barwa-Adda Expressway Limited

TITLE : TYPICAL CROSS SECTION TYPE - 13AA

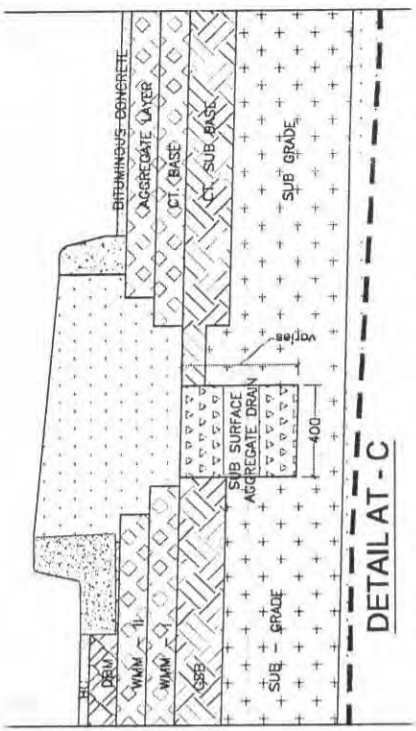
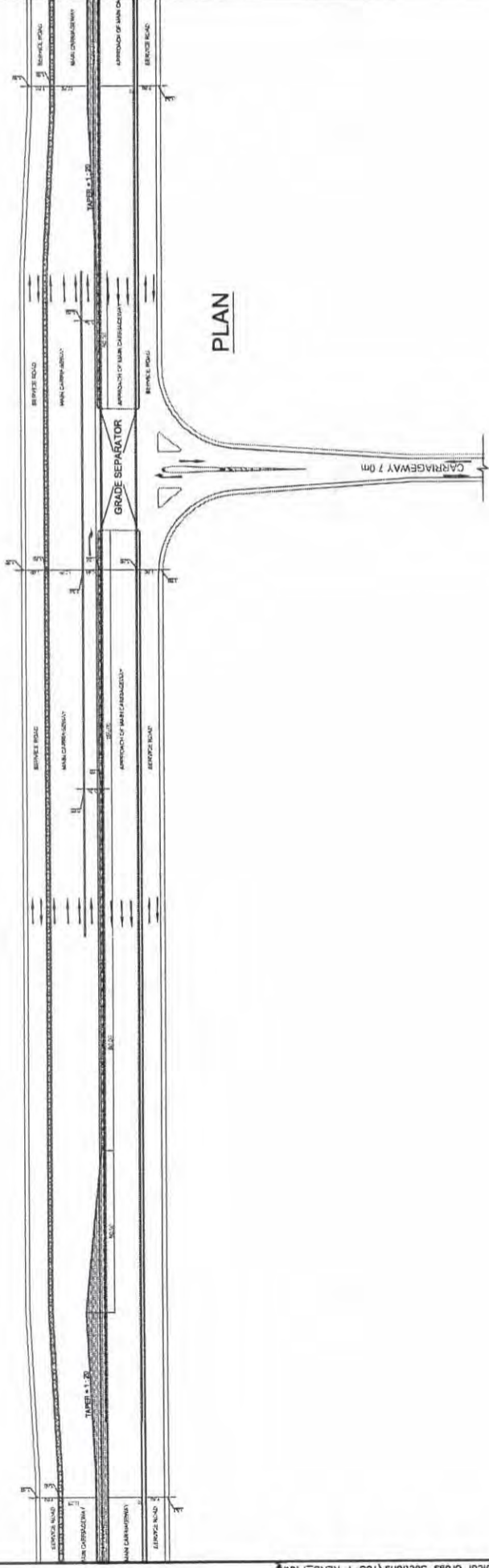
DRG. NO. : DNDA/ADV/1027-BAEL/2013/TCS/13AA

REVISION : R1



TCS - 13BB
6-LANE DIVIDED HIGHWAY WITH RIGHT SIDE (UNI DIRECTIONAL) GRADE SEPARATOR APPROACH WITH BOTH SIDE SERVICE ROAD (OPEN COUNTRY)
 (APPLICABLE WHERE NO SITE CONSTRAINT AND LIMITATION OF PROPOSED R.O.W.)

** pavement composition subjected to evaluation of pavement Design by G.V.R.*

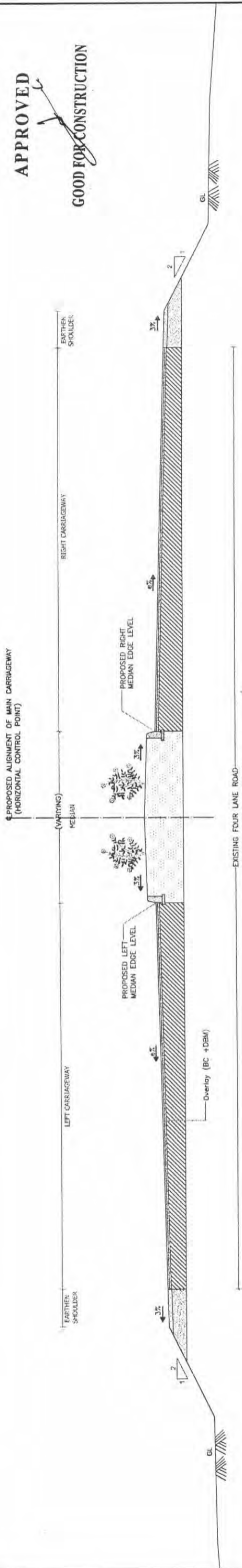


NOTES :-
 (1) FOR DETAILS OF PEDESTRIAN GUARD RAIL REFER TYPICAL DRAWING No.DNDA/ADV/1027-BAEL/2013/MISC/27
 (2) PROVIDE CONCRETE CRASH BARRIER IN MEDIAN WHEREVER MEDIAN WIDTH IS LESS THAN OR EQUAL TO 2.50m.

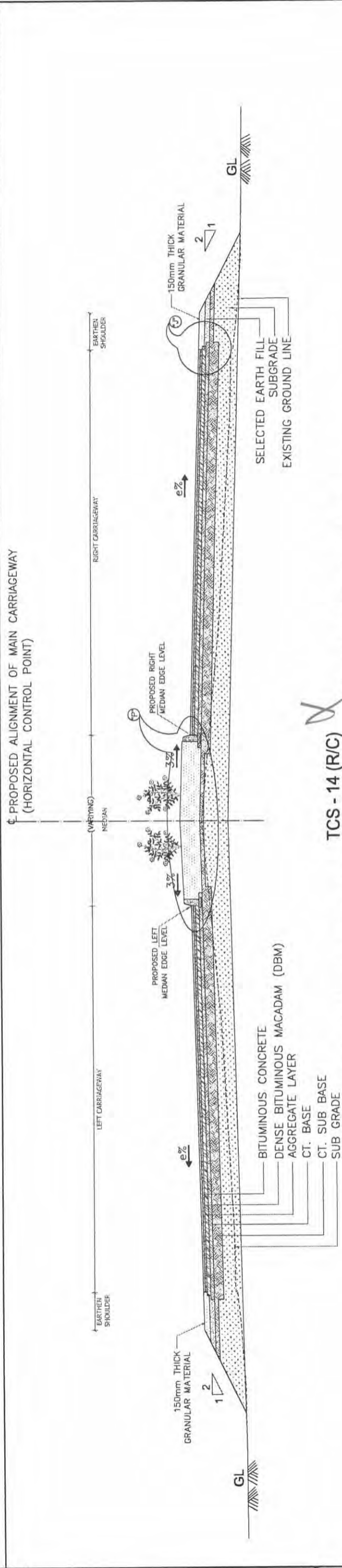
| | | | | | |
|---|---|---|------------------------------|--------------------------------|---|
| CLIENT: NATIONAL HIGHWAYS AUTHORITY OF INDIA | PROJECT: Six-laning of Barwa-Adda-Panagarh Section of NH-2 from km 398.240 to km 521.120 including Panagarh Bypass in States of Jharkhand and West Bengal under NHDP Phase V on Toll on DBFOT Pattern | DESIGN BY: IL&FS Transportation IL&FS Transportation Networks Limited | GOOD FOR CONSTRUCTION | DRWN BY : I.C. | TITLE: TYPICAL CROSS SECTION TYPE - 13BB |
| | | | | DESIGNED BY : M.M. | DRG. NO. : DNDA/ADV/1027-BAEL/2013/TCS/13BB |
| | | | | CHECKED BY : A.M. | REVISION : R1 |
| | | | | RECOMMENDED BY : A.R.M. | SCALE : |
| | | | | APPROVED BY : H.R.B. | DESCRIPTION : |



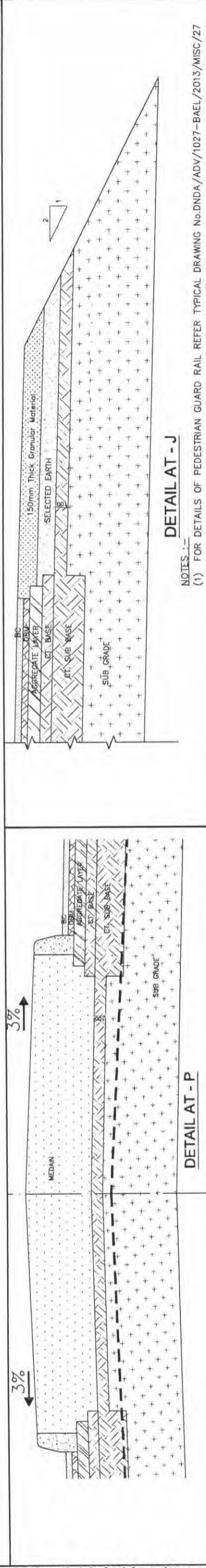
APPROVED
GOOD FOR CONSTRUCTION



TCS - 14
4-LANE DIVIDED HIGHWAY - RETAINING EXISTING CARRIAGEWAY CONFIGURATION



TCS - 14 (R/C)
4-LANE DIVIDED HIGHWAY - RETAINING EXISTING CARRIAGEWAY CONFIGURATION



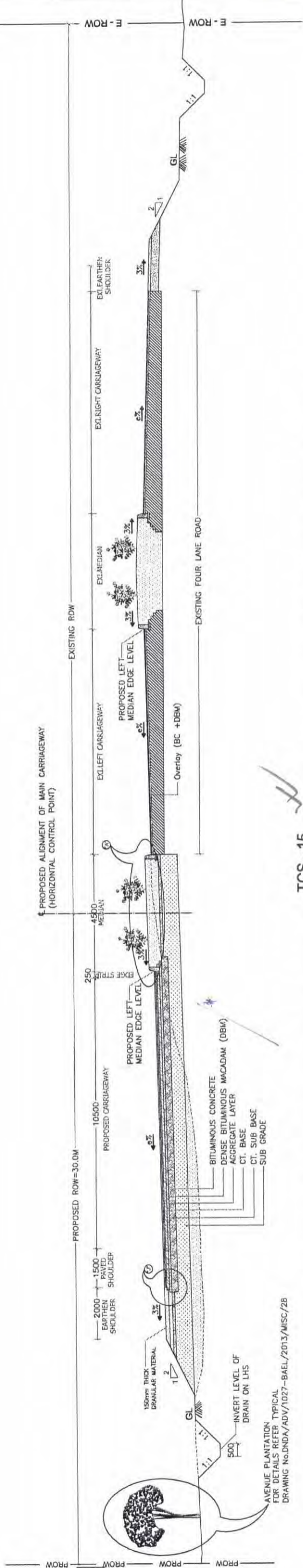
DETAIL AT - J

NOTES :-
(1) FOR DETAILS OF PEDESTRIAN GUARD RAIL REFER TYPICAL DRAWING No.DNDA/ADV/1027-B AEL/2013/MISC/27
(2) PROVIDE CONCRETE CRASH BARRIER IN MEDIAN WHEREVER MEDIAN WIDTH IS LESS THAN OR EQUAL TO 2.50m.

| | | | | | | | |
|---------------------|--|--|--|---|------------------------------|---------------------------|--|
| CLIENT : | PROJECT : Six-laning of Barwa-Adda-Panagath Section of NH-2 from km 398.240 to km 521.120 including Panagath Bypass in States of Jharkhand and West Bengal under NHDP Phase V on Toll on DBFOT Pattern | INDEPENDENT ENGINEER : S.A. Infrastructure Consultants Pvt. Ltd. 10/102, CDA, Durgam Cheruvu, Hyderabad, Andhra Pradesh, India. | CONCESSIONAIRE : Barwa Adda Expressway Limited | DESIGN BY : IL&FS Transportation IL&FS Transportation Networks Limited | GOOD FOR CONSTRUCTION | DRAWN BY : I.C. | TITLE : TYPICAL CROSS SECTION TYPE - 14 & 14(R/C) |
| | | | | | | DESIGNED BY : M.M. | DRG. NO. : DNDA/ADV/1027-B AEL/2013/TCS/14 |
| | | CHECKED BY : A.M. | REVISION : R1 | APPROVED BY : H.R.B. | SCALE : | REVISION : R1 | REVISION : R1 |

APPROVED

GOOD FOR CONSTRUCTION

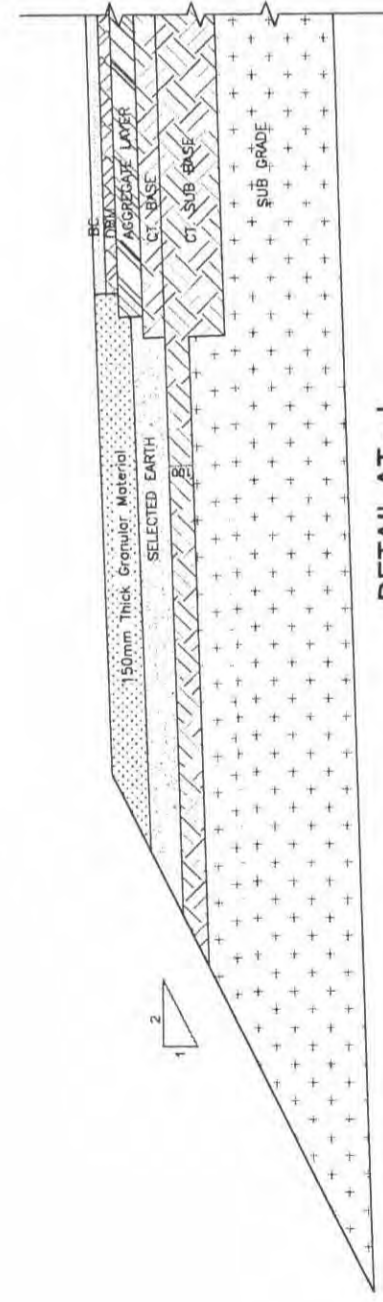
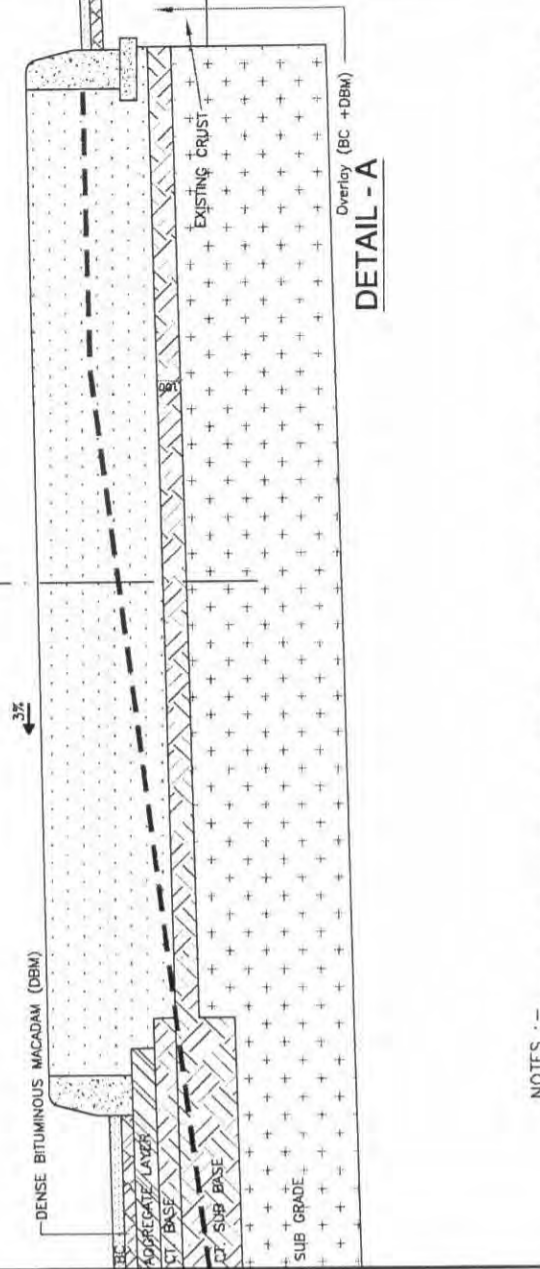


TCS - 15

6-LANE DIVIDED HIGHWAY WITH APPROACHES OF NEW BRIDGE ON LEFT SIDE AND RETAINING EXISTING (2+2 LANE) BRIDGES ON RIGHT SIDE

Government Commission subjected to finalization of pavement Design. TCS - subjected to I.E. When no. - SAICPL - Sugam - R-A - P.I.E. 17-7-2014 13-9-2014

A.V. J.V.

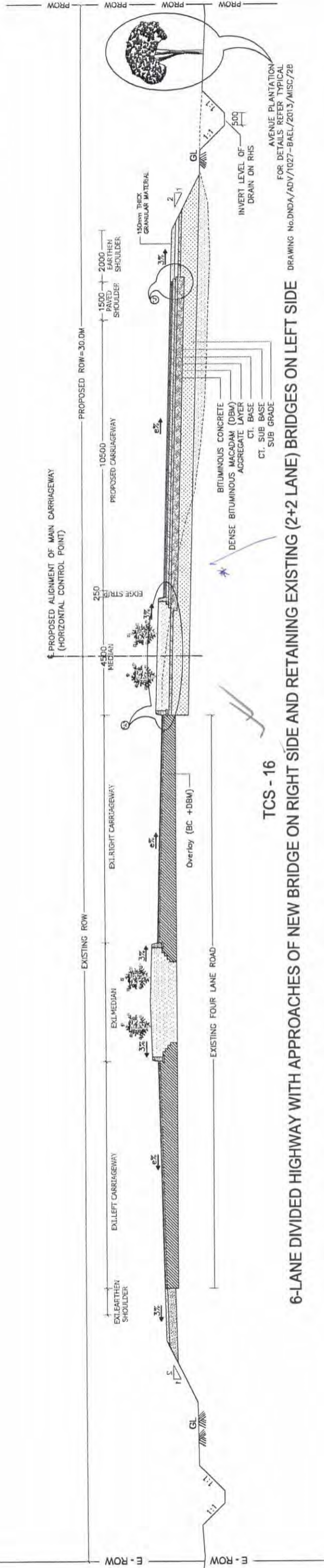


NOTES :-
 (1) FOR DETAILS OF PEDESTRIAN GUARD RAIL REFER TYPICAL DRAWING No.DNDA/ADV/1027-BAEL/2013/MISC/27
 (2) PROVIDE CONCRETE CRASH BARRIER IN MEDIAN WHEREVER MEDIAN WIDTH IS LESS THAN OR EQUAL TO 2.50m.

| | | | | | | |
|---|---|---|---|---|---------------|--|
| CLIENT: NATIONAL HIGHWAYS AUTHORITY OF INDIA | PROJECT: Six-laning of Barwa-Adda-Panagarh Section of NH-2 from km 398.240 to km 521.120 including Panagarh Bypass in States of Jharkhand and West Bengal under NHDP Phase V on Toll on DBFOT Pattern | INDEPENDENT ENGINEER: Barwa Adda Expressway Limited | DESIGN BY: IL&FS Transportation IL&FS Transportation Networks Limited | GOOD FOR CONSTRUCTION | | TITLE: TYPICAL CROSS SECTION TYPE - 15 |
| | | | | REV. NO. : DND/ADV/1027-BAEL/2013/TCS/15 | REVISION : R2 | DRAWN BY : I.C. |
| DATE: 08/01/2015 PATH: \\D:\SRV\1027 Barwa Adda\6 Deliverables\2 Drawings\1 Highways\2 Typical Cross Sections\TCS-1-KERB_P.dwg | | REV. DATE DESCRIPTION R2 08/01/2015 REVISED AS PER COMMENTS R1 14/10/2014 REVISED AS PER COMMENTS R0 27/01/2014 FOR SUBMISSION | | SCALE : | | SCALE : |

APPROVED

GOOD FOR CONSTRUCTION



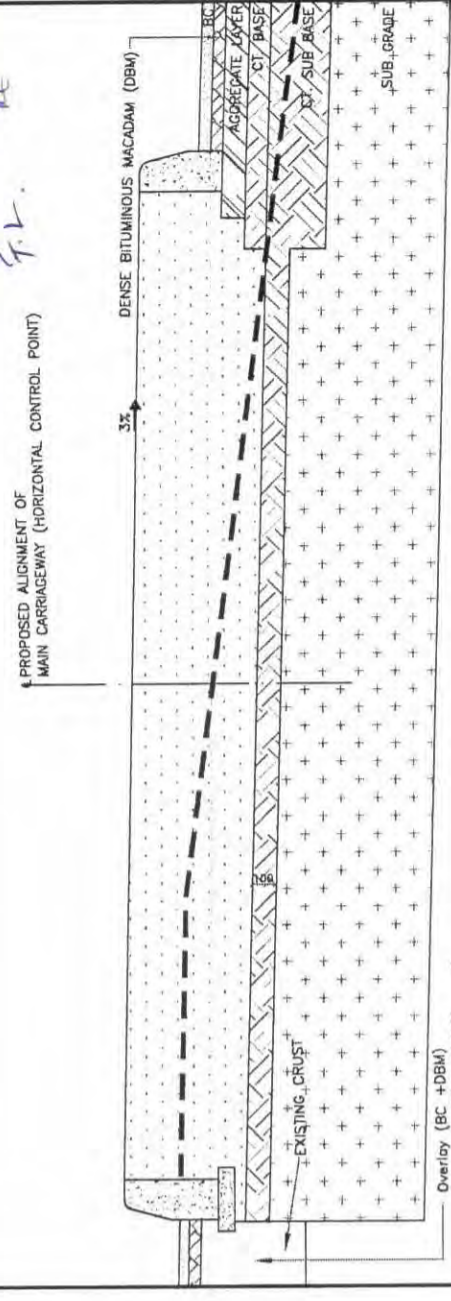
TCS - 16

6-LANE DIVIDED HIGHWAY WITH APPROACHES OF NEW BRIDGE ON RIGHT SIDE AND RETAINING EXISTING (2+2 LANE) BRIDGES ON LEFT SIDE

DRAWING No. DND/ADV/1027-BAEL/2013/MISC/2B

* Pavement composition subjected to finalization of pavement design. J.V. 8.1.16

TCS - Subjected to IE letter no. - 3AICPL-SUGAM-13-A-P-IE/NH-2/2014/306 dated 30/9/2014. J.V. 8.1.16

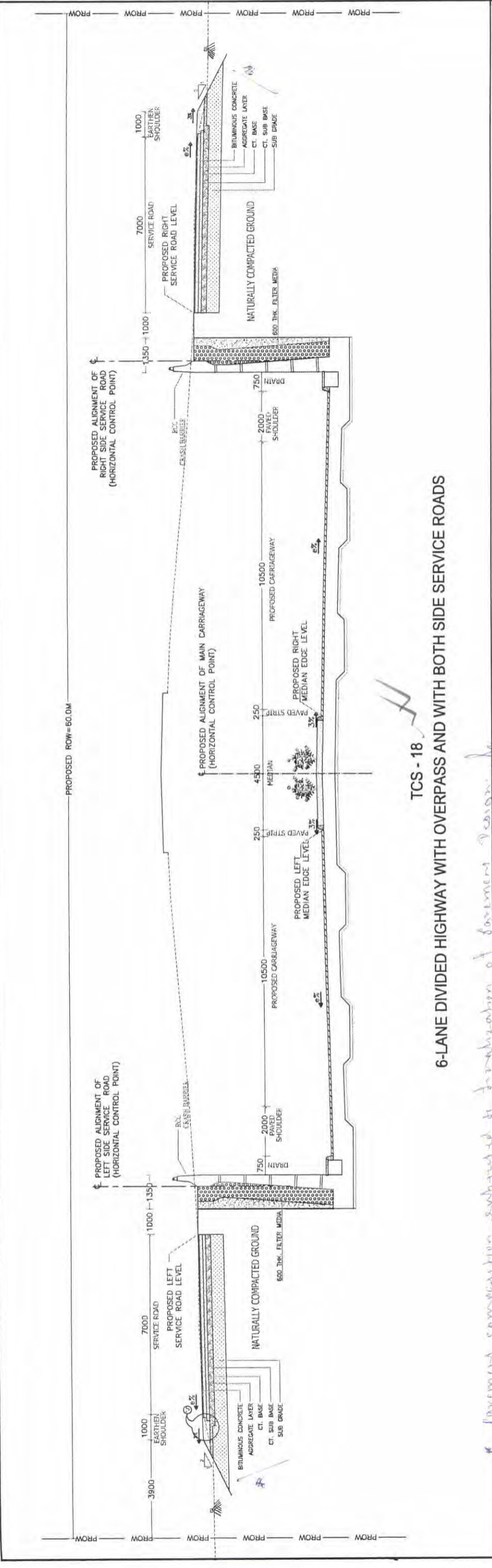


DETAIL - A

DETAIL AT - J

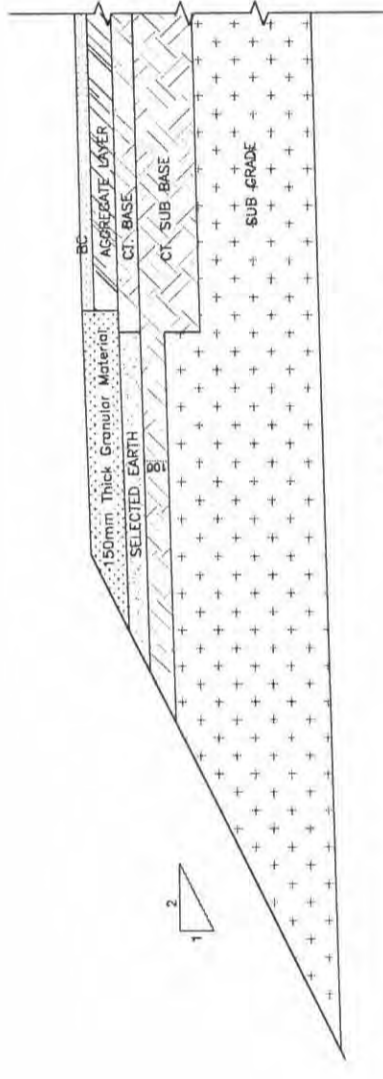
NOTES :-
 (1) FOR DETAILS OF PEDESTRIAN GUARD RAIL REFER TYPICAL DRAWING No. DND/ADV/1027-BAEL/2013/MISC/27
 (2) PROVIDE CONCRETE CRASH BARRIER IN MEDIAN WHEREVER MEDIAN WIDTH IS LESS THAN OR EQUAL TO 2.50m.

| | | | | | |
|---|--|---|---|---|---|
| CLIENT : NATIONAL HIGHWAYS AUTHORITY OF INDIA | PROJECT : Six-laning of Barwa-Adda-Panagarh Section of NH-2 from km 398.240 to km 521.120 including Panagarh Bypass in States of Jharkhand and West Bengal under NHDP Phase V on Toll on DBFOT Pattern | DESIGN BY : IL&FS Transportation IL&FS Transportation Networks Limited | GOOD FOR CONSTRUCTION REV: 02/01/2015 REVED AS PER IE COMMENTS R1 14/10/2014 FOR IE COMMENTS R0 27/01/2014 FOR SUBMISSION | GOOD FOR CONSTRUCTION DRAWN BY : I.C. DESIGNED BY : M.M. CHECKED BY : A.M. RECOMMENDED BY : A.R.M. / J.V. APPROVED BY : H.R.B. / J.V. | TITLE : TYPICAL CROSS SECTION TYPE - 16 |
| | | | | | |



TCS - 18
6-LANE DIVIDED HIGHWAY WITH OVERPASS AND WITH BOTH SIDE SERVICE ROADS

** Pavement construction subjected to finalization of pavement design.*



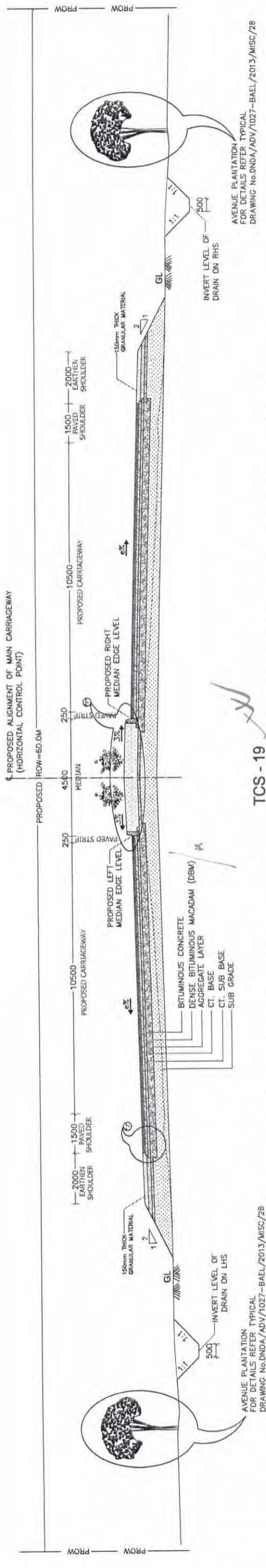
DETAIL AT - J

APPROVED
GOOD FOR CONSTRUCTION

NOTES :-
 (1) FOR DETAILS OF PEDESTRIAN GUARD RAIL REFER TYPICAL DRAWING No.DNDA/ADV/1027-BAEL/2013/MISC/27
 (2) PROVIDE CONCRETE CRASH BARRIER IN MEDIAN WHEREVER MEDIAN WIDTH IS LESS THAN OR EQUAL TO 2.50m.

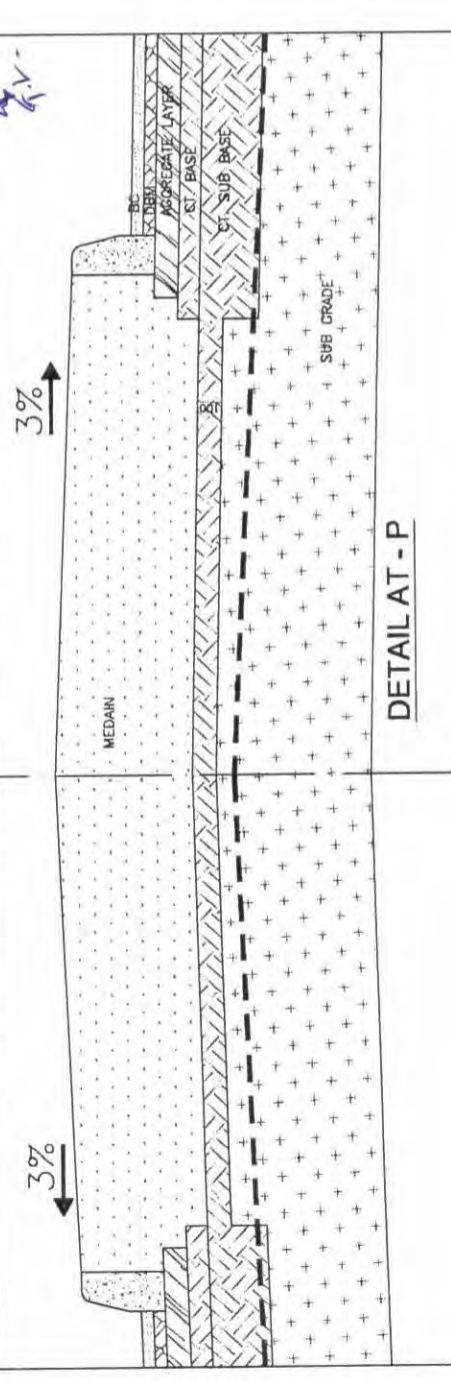
| | | | | | |
|--|---|--|---|---|--|
| CLIENT: NATIONAL HIGHWAYS AUTHORITY OF INDIA | PROJECT: Six-laning of Barwa-Adda-Panagah Section of NH-2 from km 398.240 to km 521.120 including Panagah Bypass in States of Jharkhand and West Bengal under NHDP Phase V on Toll on DBFOT Pattern | INDEPENDENT ENGINEER: S.A. Infrastructure Consultants Pvt. Ltd. 101/102, 1st Floor, Barwa Bypass, Panagah, West Bengal, India. | DESIGN BY: IL&FS Transportation IL&FS Transportation Networks Limited | GOOD FOR CONSTRUCTION | GOOD FOR CONSTRUCTION |
| | | | | REV. NO. : R2 DATE : 05/01/2015 DESCRIPTION : REVISED AS PER I.E. COMMENTS R1 : 19/06/2014 R0 : 27/01/2014 FOR SUBMISSION | TITLE : TYPICAL CROSS SECTION TYPE - 18 DRG. NO. : DNDA/ADV/1027-BAEL/2013/TCS/18 REVISION : R2 |
| DRAWN BY : I.C. DESIGNED BY : M.M. CHECKED BY : A.M. RECOMMENDED BY : A.R.M. APPROVED BY : H.R.B. | | SCALE : | | | |

APPROVED
GOOD FOR CONSTRUCTION

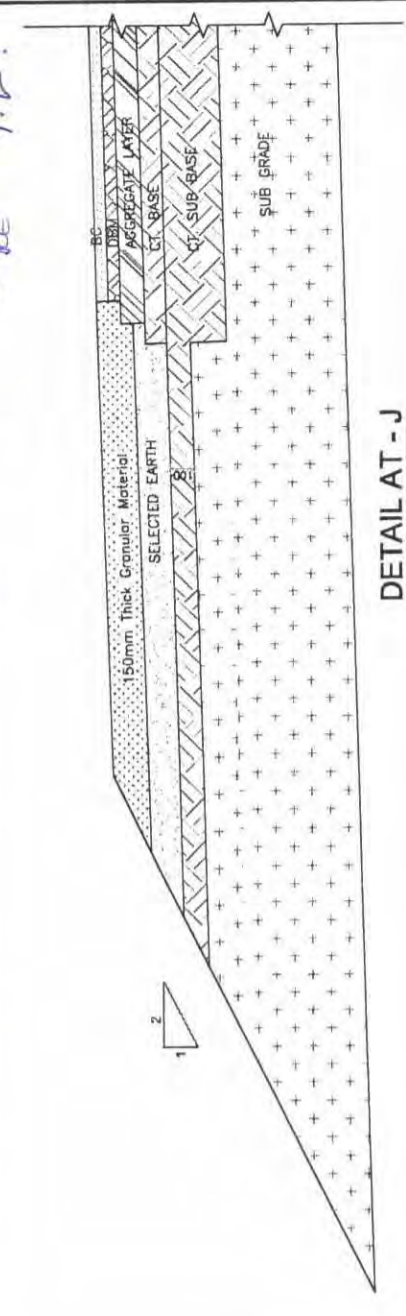


TCS - 19
6-LANE DIVIDED HIGHWAY WITH NEW CONSTRUCTION OF REALIGNED / BYPASS SECTIONS WITHOUT SERVICE ROAD

* Government comparison submitted to I.C. Jetter and to I.C. Jetter and to I.C. Jetter - SAI CPL - SUPPLY - B-A-P-IE / N/A - 2/2014
1394 dt - 19/12/2014. Jm
T.L.



DETAIL AT - P

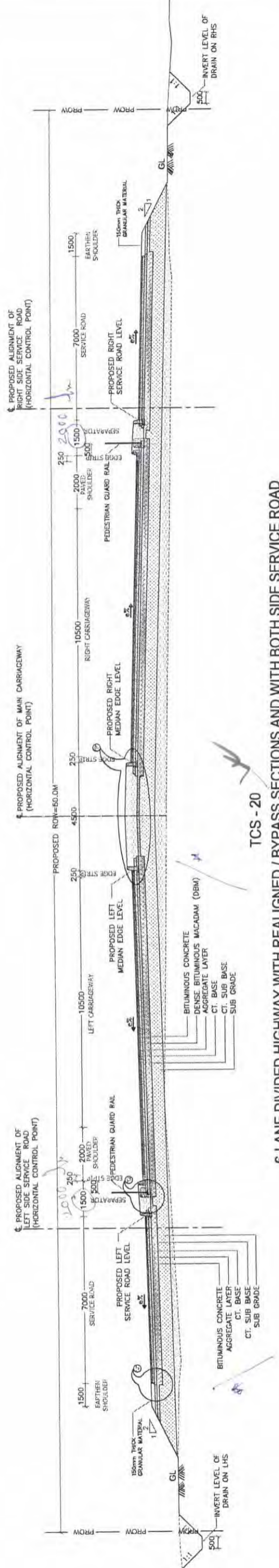


DETAIL AT - J

NOTES :-
(1) FOR DETAILS OF PEDESTRIAN GUARD RAIL REFER TYPICAL DRAWING No.DNDA/ADV/1027-BAL/2013/MISC/27
(2) PROVIDE CONCRETE CRASH BARRIER IN MEDIAN WHEREVER MEDIAN WIDTH IS LESS THAN OR EQUAL TO 2.50m.

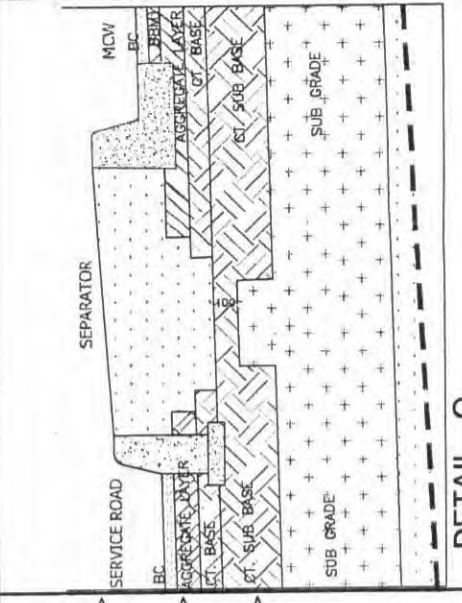
| | | | | | |
|--|---|--|---|---|---|
| CLIENT: NATIONAL HIGHWAYS AUTHORITY OF INDIA | PROJECT: Six-laning of Barwa-Adda-Panagarh Section of NH-2 from km 398.240 to km 521.120 including Panagarh Bypass in States of Jharkhand and West Bengal under NHDP Phase V on Toll on DBFOT Pattern | DESIGN BY: IL&FS Transportation IL&FS Transportation Networks Limited | GOOD FOR CONSTRUCTION | | TITLE: TYPICAL CROSS SECTION TYPE - 19 |
| | | | INDEPENDENT ENGINEER: S.A. Infrastructure Consultants Pvt. Ltd. CONSULTANTS CONVESSIONAIRE: Barwa Adda Expressway Limited | DRAWN BY : L.C. DESIGNED BY : M.M. CHECKED BY : A.M. RECOMMENDED BY : A.R.M. APPROVED BY : H.R.B. | DRG. NO. : DNDA/ADV/1027-BAL/2013/TCS/19 |
| REVISION: R1 05/01/2015 REVISED AS PER COMMENTS FOR SUBMISSION R2 27/01/2014 FOR SUBMISSION | | DATE: _____ DESCRIPTION: _____ | SCALE: _____ | DATE: _____ DESCRIPTION: _____ | SCALE: _____ |

APPROVED
GOOD FOR CONSTRUCTION

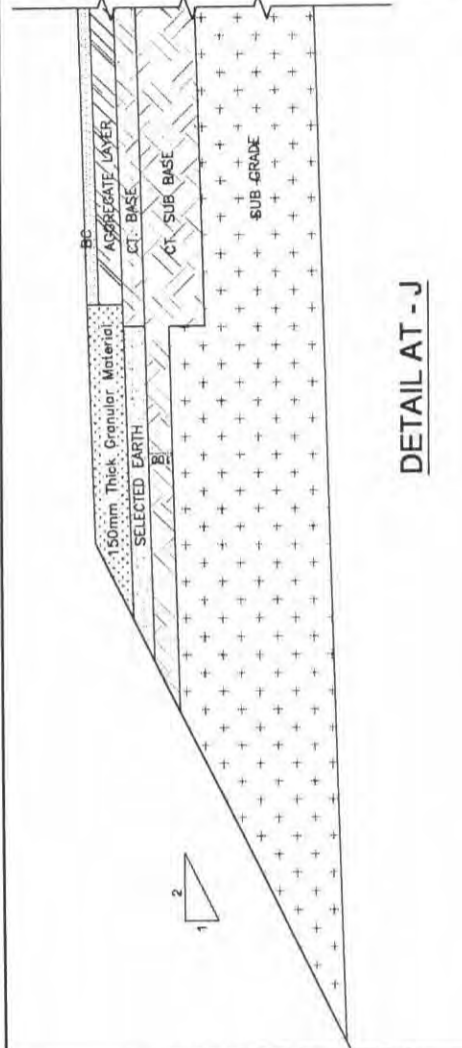


TCS - 20
6-LANE DIVIDED HIGHWAY WITH REALIGNED / BYPASS SECTIONS AND WITH BOTH SIDE SERVICE ROAD

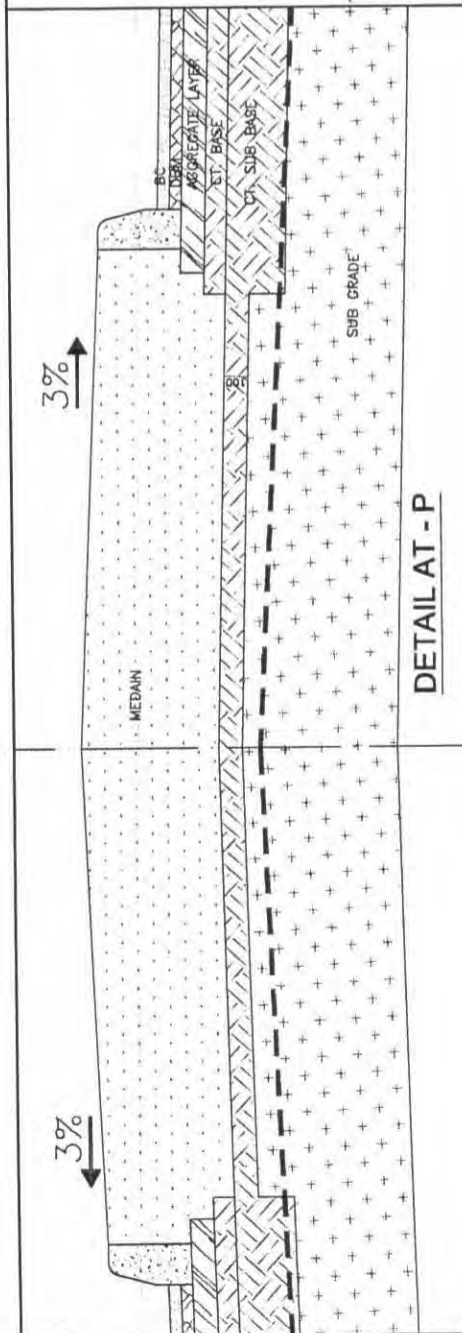
A Government Corporation subjected to Approval Design by M.V.



DETAIL - Q



DETAIL AT - J



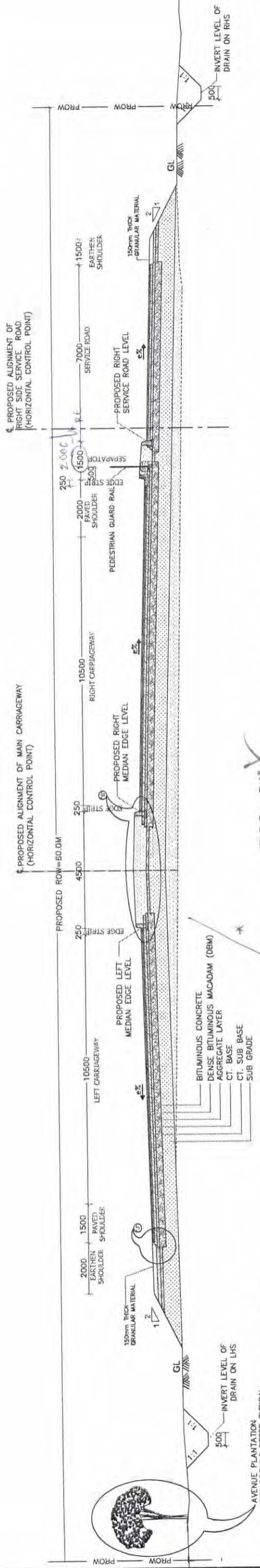
DETAIL AT - P

NOTES :-
(1) FOR DETAILS OF PEDESTRIAN GUARD RAIL REFER TYPICAL DRAWING No.DNDA/ADV/1027-BAEL/2013/MISC/27
(2) PROVIDE CONCRETE CRASH BARRIER IN MEDIAN WHEREVER MEDIAN WIDTH IS LESS THAN OR EQUAL TO 2.50m.

| | | | | | |
|--|---|---|---|--|--|
| CLIENT: NATIONAL HIGHWAYS AUTHORITY OF INDIA | PROJECT: Six-laning of Barwa-Adda-Panagarh Section of NH-2 from km 398.240 to km 521.120 including Panagarh Bypass in States of Jharkhand and West Bengal under NHDP Phase V on Toll on DBFOT Pattern | DESIGN BY: IL&FS Transportation IL&FS Transportation Networks Limited | GOOD FOR CONSTRUCTION | | TITLE: TYPICAL CROSS SECTION TYPE - 20 |
| | | | DRAWN BY : I.C. DESIGNED BY : M.M. CHECKED BY : A.M. RECOMMENDED BY : A.R.M. APPROVED BY : H.R.B. | DRG. NO. : DNDA/ADV/1027-BAEL/2013/TCS/20 REVISION : R2 | |
| INDEPENDENT ENGINEER: S.P.L.S.A. Infrastructure Consultants Pvt. Ltd. CONSTRUCTION ENGINEERING BARWA ADDA EXPRESSWAY LIMITED | | REV. DATE DESCRIPTION R2 05/01/2015 REVISED AS PER E COMMENTS R1 14/10/2014 REVISED AS PER E COMMENTS FOR SUBMISSION R0 27/01/2014 | | SCALE : | |

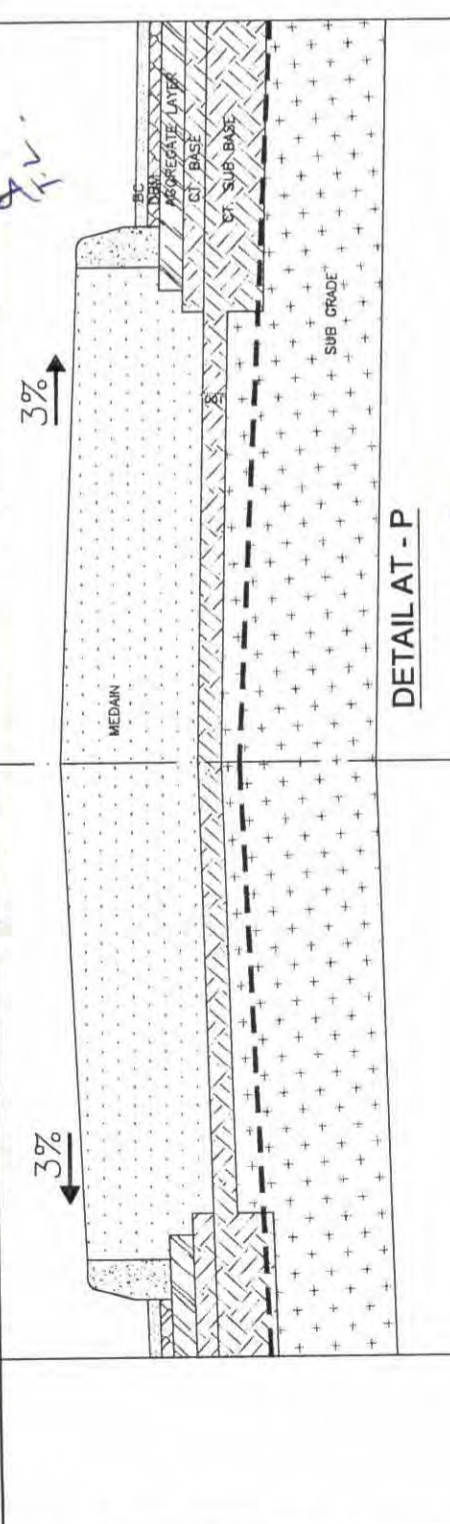
APPROVED

GOOD FOR CONSTRUCTION

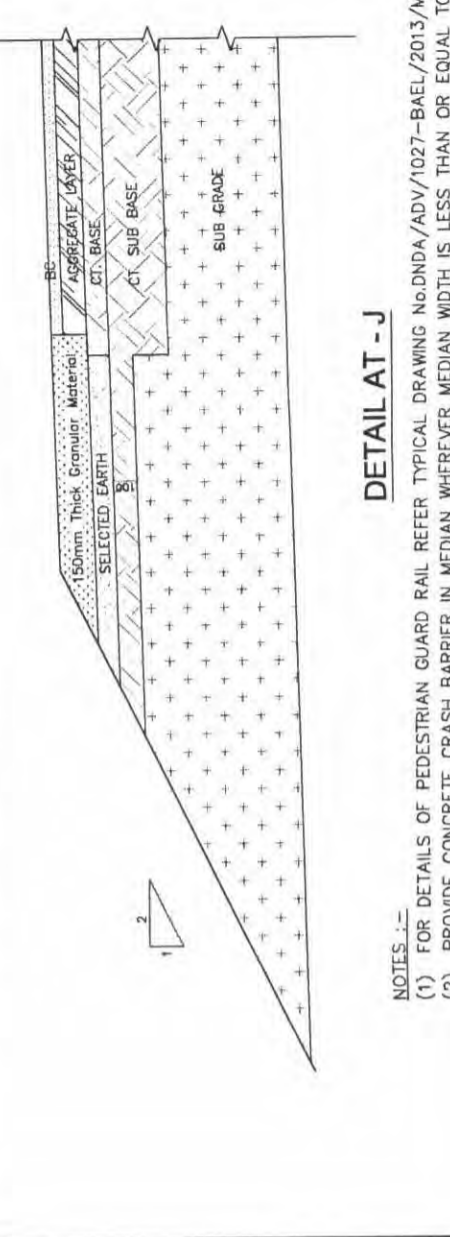


TCS - 21
TYPICAL CROSS SECTION WITH RIGHT SIDE SERVICE ROAD ON BYPASS

* Pavement Construction Subjected to finalization of pavement Design. J.K.



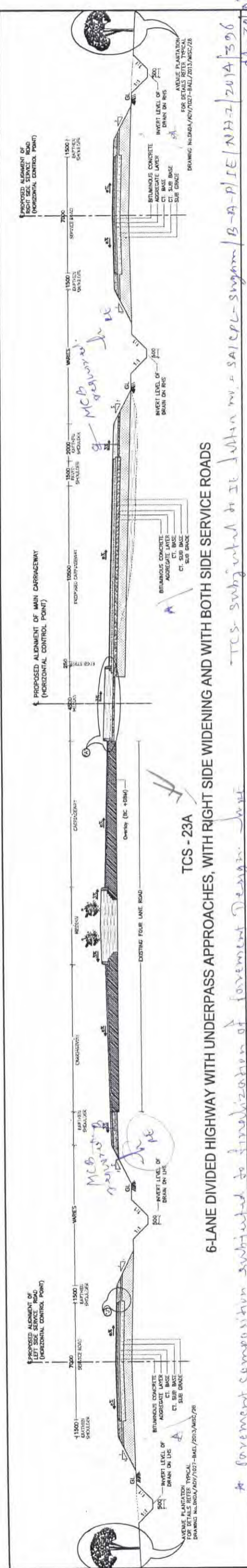
DETAIL AT - P



DETAIL AT - J

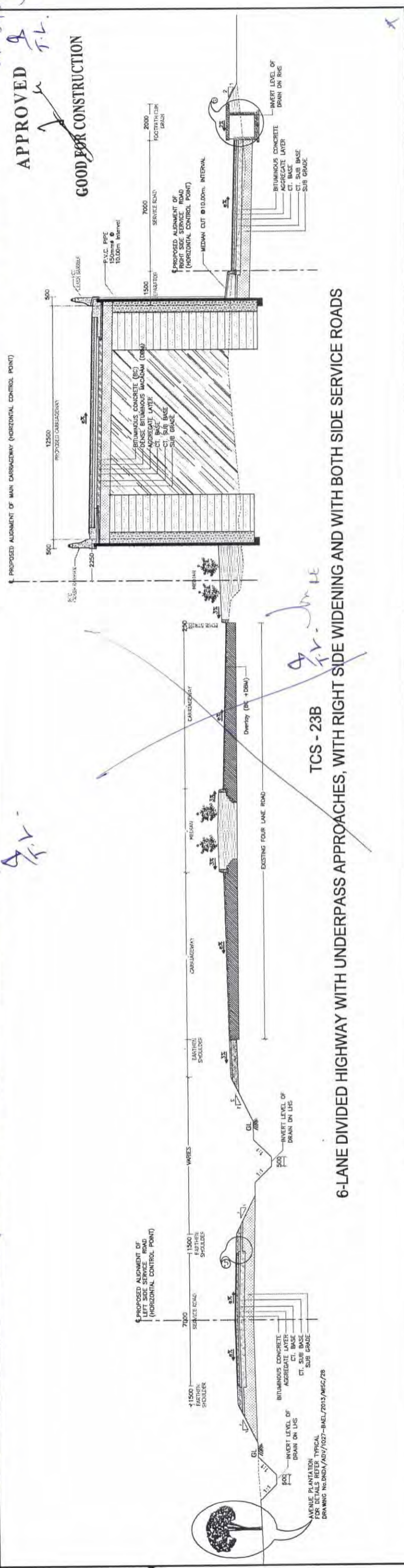
NOTES :-
 (1) FOR DETAILS OF PEDESTRIAN GUARD RAIL REFER TYPICAL DRAWING No.DND/ADV/1027-BAEL/2013/MISC/27
 (2) PROVIDE CONCRETE CRASH BARRIER IN MEDIAN WHEREVER MEDIAN WIDTH IS LESS THAN OR EQUAL TO 2.50m.

| | | | | | | | |
|--------------------|---|--|--|--|--|---|--|
| CLIENT: | PROJECT: Six-laning of Barwa-Adda-Panagarh Section of NH-2 from km 398.240 to km 521.120 including Panagarh Bypass in States of Jharkhand and West Bengal under NHDP Phase V on Toll on DBFOT Pattern | INDEPENDENT ENGINEER: S.A. Infrastructure Consultants Pvt. Ltd. CONSIGNAIRE: Barwa Adda Expressway Limited | DESIGN BY: IL&FS Transportation Networks Limited | GOOD FOR CONSTRUCTION | | TITLE: TYPICAL CROSS SECTION TYPE - 21 | |
| | | | | 06/01/2015 R2 14/10/2014 R1 27/01/2014 R0 | REVISED AS PER E COMMENTS FOR SUBMISSION | DRAWN BY : I.C. DESIGNED BY : M.M. CHECKED BY : A.M. RECOMMENDED BY : A.R.M. APPROVED BY : H.R.B. | DRG. NO.: DND/ADV/1027-BAEL/2013/TCS/21 |

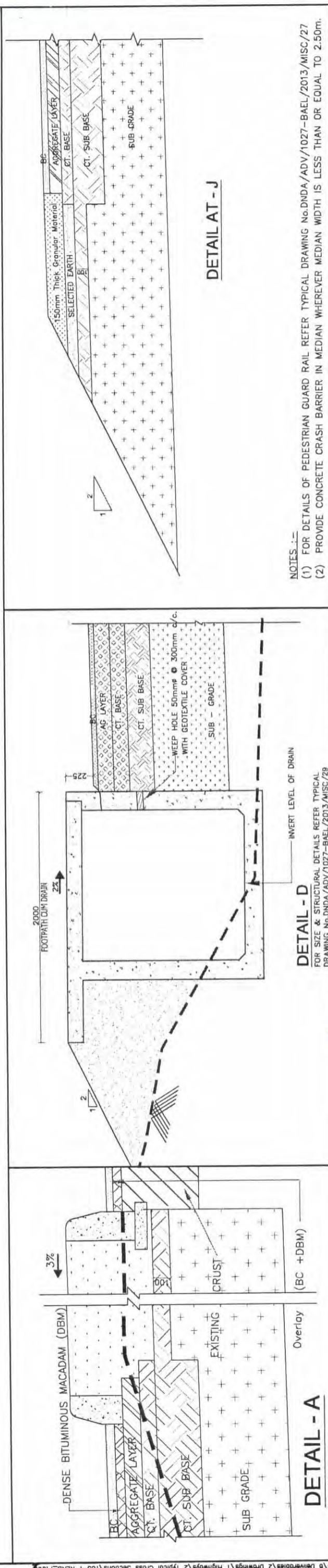


TCS - 23A
6-LANE DIVIDED HIGHWAY WITH UNDERPASS APPROACHES, WITH RIGHT SIDE WIDENING AND WITH BOTH SIDE SERVICE ROADS

Government compensation submitted to finalization of Government Design. Just
TCS - submitted to I.E. Jahan m.v. SAICPL-Singam/B-A-PIE/NH-2/2014/306
at-30/01/2014

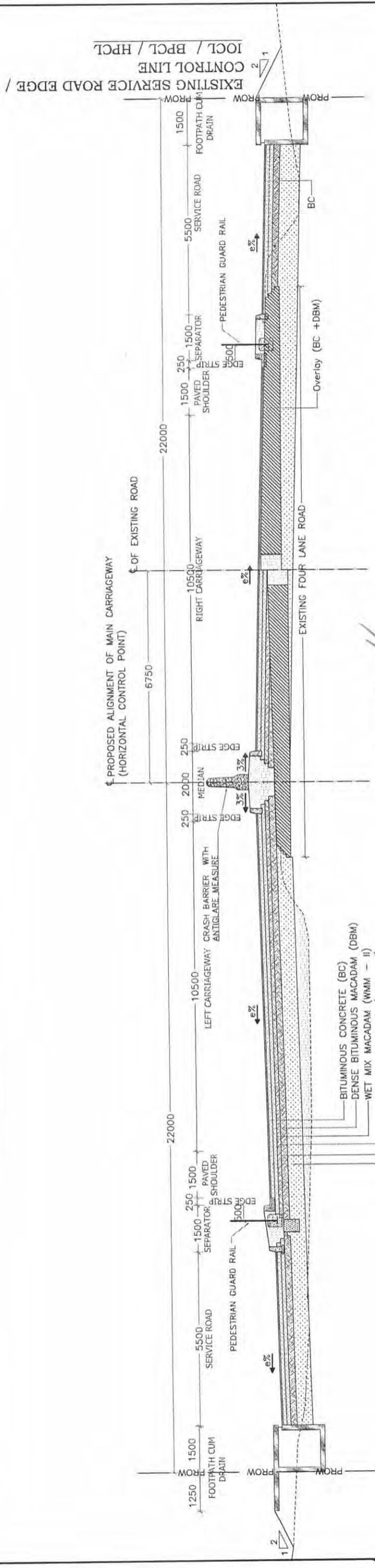


TCS - 23B
6-LANE DIVIDED HIGHWAY WITH UNDERPASS APPROACHES, WITH RIGHT SIDE WIDENING AND WITH BOTH SIDE SERVICE ROADS

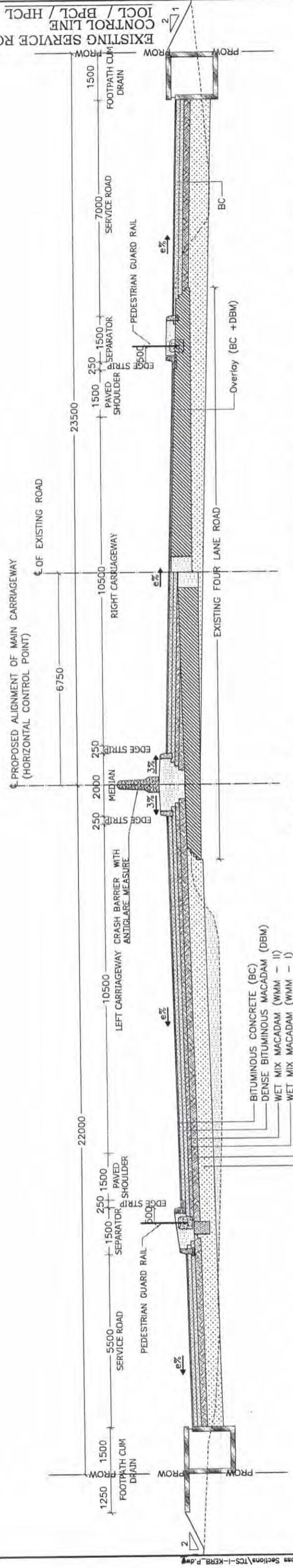


| | |
|---|---|
| GOOD FOR CONSTRUCTION DRAWN BY : I.C. DESIGNED BY : M.M. CHECKED BY : A.M. RECOMMENDED BY : A.R.M. APPROVED BY : H.R.B. | GOOD FOR CONSTRUCTION TITLE : TYPICAL CROSS SECTION TYPE - 23A & 23B |
| | |
| CLIENT : NATIONAL HIGHWAYS AUTHORITY OF INDIA | PROJECT : Six-laning of Barwa-Adda-Panagarh Section of NH-2 from km 398.240 to km 521.120 including Panagarh Bypass in States of Jharkhand and West Bengal under NHDP Phase V on Toll on DBFOT Pattern |
| INDEPENDENT ENGINEER : IL&FS Transportation IL&FS Transportation Networks Limited | DESIGN BY : IL&FS Transportation IL&FS Transportation Networks Limited |
| DATE: 06/01/2015 - 3:15pm PATH: \\DATA\SRV\1027 Barwa Adda\8 Deliverables\2 Drawings\2 Typical Cross Sections\TCS-1-KERB.Pdw | DRG. NO.: DND/ADV/1027-BAEL/2013/TCS/23 REVISION: R1 |

NOTES :-
 (1) FOR DETAILS OF PEDESTRIAN GUARD RAIL REFER TYPICAL DRAWING No.DNDA/ADV/1027-BAEL/2013/MISC/27
 (2) PROVIDE CONCRETE CRASH BARRIER IN MEDIAN WHEREVER MEDIAN WIDTH IS LESS THAN OR EQUAL TO 2.50m.



TCS-25A
6-LANE DIVIDED HIGHWAY WITH ECCENTRIC WIDENING AND WITH BOTH SIDE 5.5m SERVICE ROAD (BUILT-UP SECTION)



TCS-25B
6-LANE DIVIDED HIGHWAY WITH ECCENTRIC WIDENING AND WITH LEFT SIDE 5.5m. & RIGHT SIDE 7.0m. SERVICE ROAD (BUILT-UP SECTION)

APPROVED
GOOD FOR CONSTRUCTION

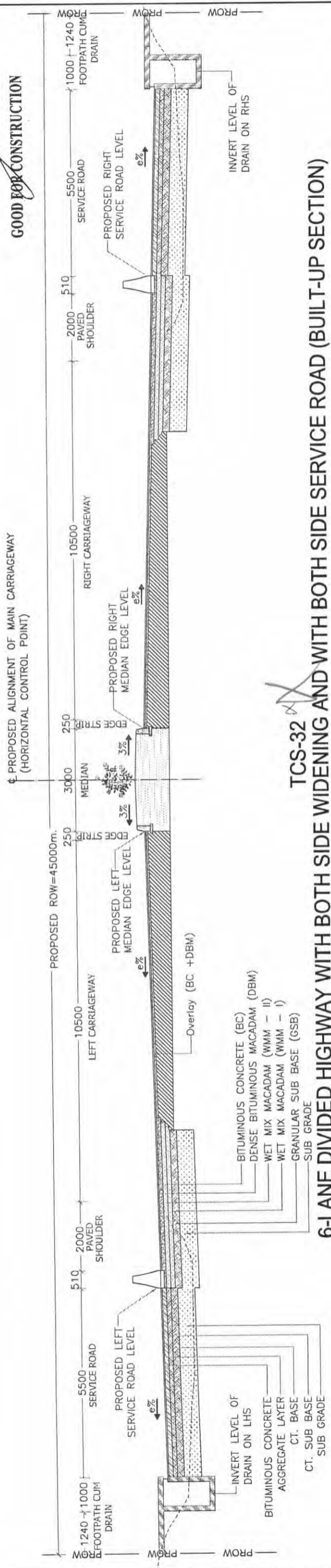
Note:- Pavement composition subjected to finalization of pavement design by G.V.

NOTES:-
 (1) FOR DETAILS OF PEDESTRIAN GUARD RAIL REFER TYPICAL DRAWING No.DND/ADV/1027-BAEL/2013/MISC/27
 (2) PROVIDE CONCRETE CRASH BARRIER IN MEDIAN WHEREVER MEDIAN WIDTH IS LESS THAN OR EQUAL TO 2.50m.

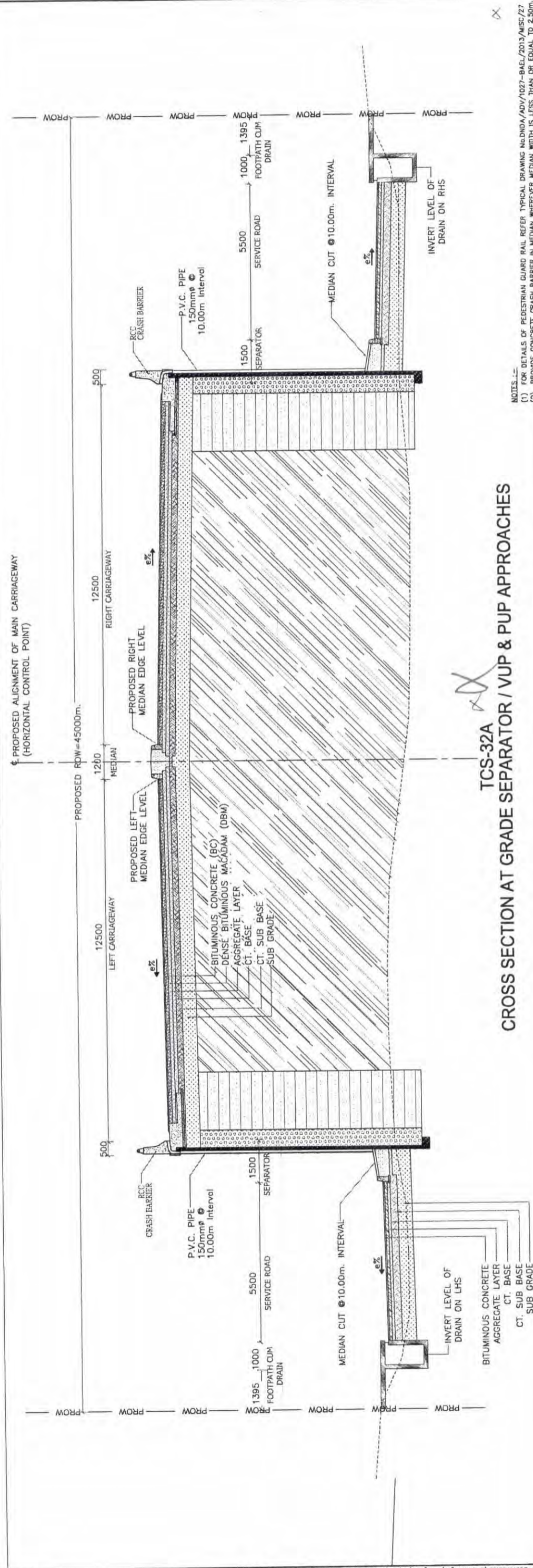
| | | | | | | |
|--------------------|---|---|--|---|-------------------------|--|
| CLIENT: | PROJECT: Six-laning of Barwa-Adda-Panagarh Section of NH-2 from km 398.240 to km 521.120 including Panagarh Bypass in States of Jharkhand and West Bengal under NHDP Phase V on Toll on DBFOT Pattern | INDEPENDENT ENGINEER: Barwa Adda Expressway Limited | DESIGN BY: IL&FS Transportation Networks Limited | GOOD FOR CONSTRUCTION | | TITLE: TYPICAL CROSS SECTION TYPE - 25A & 25B |
| | | | | DRAWN BY : I.C. DESIGNED BY : M.M. CHECKED BY : A.M. RECOMMENDED BY : A.R.M. APPROVED BY : H.R.B. | DATE : DESCRIPTION : | |

APPROVED

GOOD FOR CONSTRUCTION



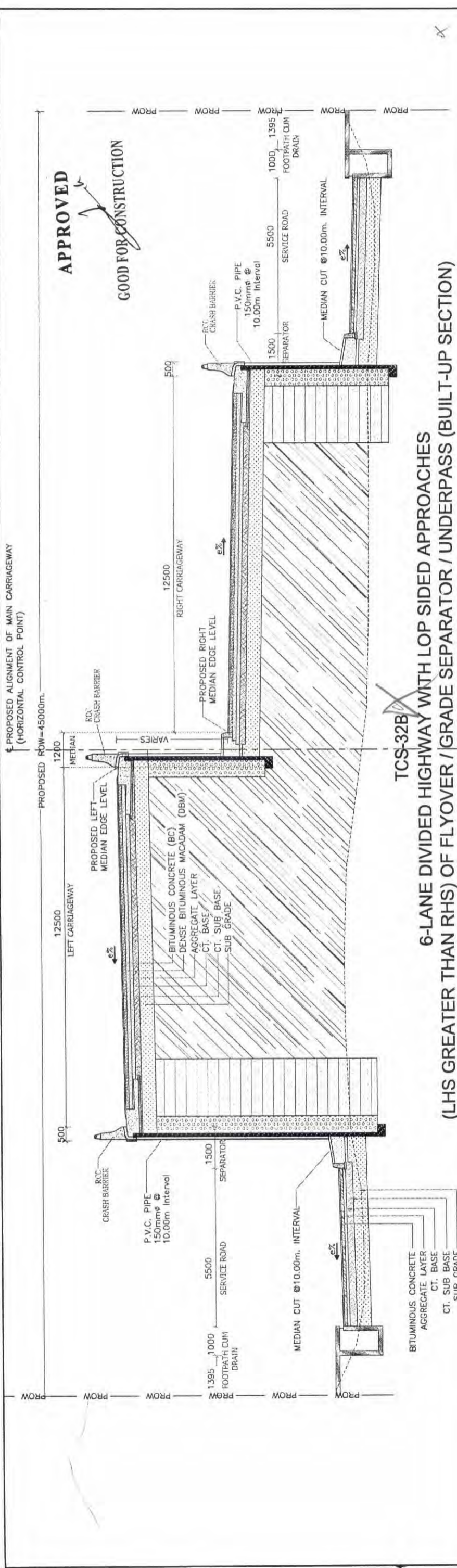
TCS-32
6-LANE DIVIDED HIGHWAY WITH BOTH SIDE WIDENING AND WITH BOTH SIDE SERVICE ROAD (BUILT-UP SECTION)



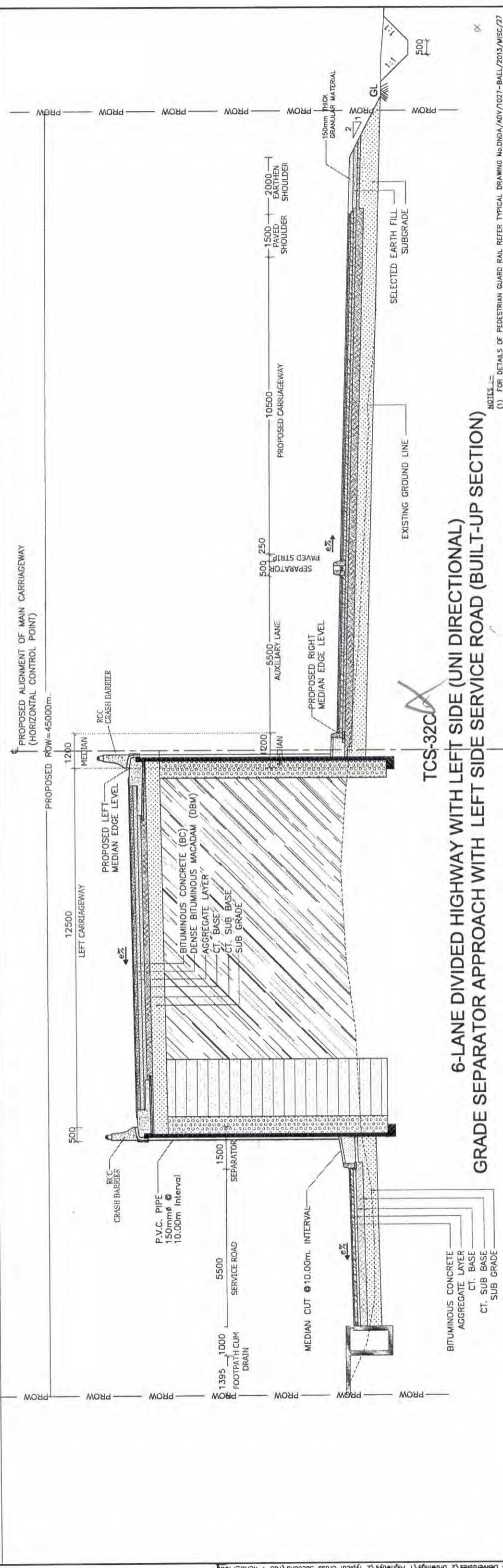
TCS-32A
CROSS SECTION AT GRADE SEPARATOR / VUP & PUP APPROACHES

NOTES:-
 (1) FOR DETAILS OF PEDESTRIAN GUARD RAIL REFER TYPICAL DRAWING No.DND/A/ADV/1027-BAEL/2013/MISC/27
 (2) PROVIDE CONCRETE CRASH BARRIER IN MEDIAN WHEREVER MEDIAN WIDTH IS LESS THAN OR EQUAL TO 2.50m.

| | | | | | | | | |
|---|---|--|---|---|------------------------------|--|----------------------------|-------------------------------|
| CLIENT: NATIONAL HIGHWAYS AUTHORITY OF INDIA | PROJECT: Six-laning of Barwa-Adda-Panagarh Section of NH-2 from km 398.240 to km 521.120 including Panagarh Bypass in States of Jharkhand and West Bengal under NHDP Phase V on Toll on DBFOT Pattern | CONCESSIONAIRE: Barwa Adda Expressway Limited | INDEPENDENT ENGINEER: S.A. Infrastructure Consultants Pvt. Ltd. 101-102, Park Road, Sector 17, Gurgaon, Haryana | DESIGN BY: IL&FS Transportation IL&FS Transportation Networks Limited | GOOD FOR CONSTRUCTION | REV. R1 05/01/2015 BASED AS PER COMMENTS FOR REVIEW | DATE 17/06/2014 | DESCRIPTION |
| | | | | | | SCALE: R1 | APPROVED BY: H.R.B. | RECOMMENDED BY: A.R.M. |



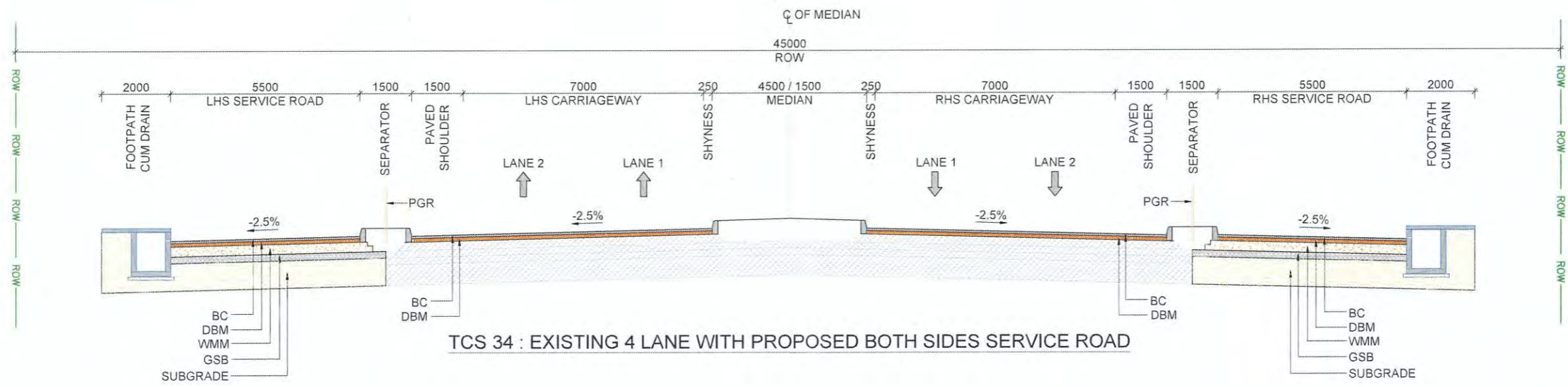
TCS-32B
6-LANE DIVIDED HIGHWAY WITH LOP SIDED APPROACHES
(LHS GREATER THAN RHS) OF FLYOVER / GRADE SEPARATOR / UNDERPASS (BUILT-UP SECTION)



TCS-32C
6-LANE DIVIDED HIGHWAY WITH LEFT SIDE (UNI DIRECTIONAL)
GRADE SEPARATOR APPROACH WITH LEFT SIDE SERVICE ROAD (BUILT-UP SECTION)

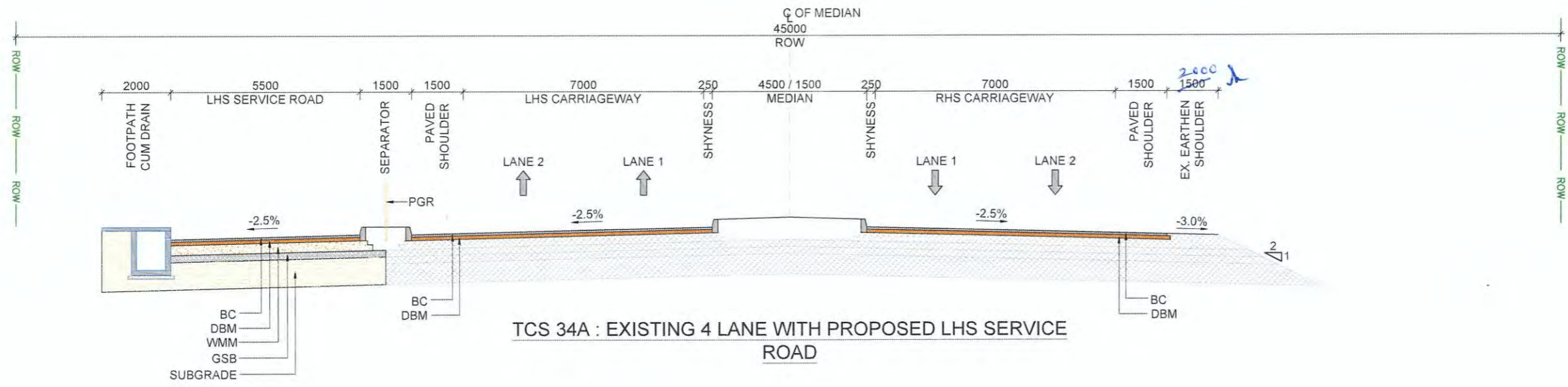
APPROVED
GOOD FOR CONSTRUCTION

| | | | | | |
|--|---|--|--|--|--|
| CLIENT: | PROJECT: Six-laning of Barwa-Adda-Panagah Section of NH-2 from km 398.240 to km 521.120 including Panagah Bypass in States of Jharkhand and West Bengal under NHDP Phase V on Toll on DBFOT Pattern | INDEPENDENT ENGINEER: S.A. Infrastructure Consultants Pvt. Ltd. CONSTRUCTION ENGINEERS Barwa Adda Expressway Limited | DESIGN BY: IL&FS Transportation IL&FS Transportation Networks Limited | GOOD FOR CONSTRUCTION | GOOD FOR CONSTRUCTION |
| | | | | R1 05/01/2015 R0 19/12/2014 REV. DATE DESCRIPTION | REVISED AS PER COMMENTS FOR SUBMISSION |
| NOTES: (1) FOR DETAILS OF PEDESTRIAN GUARD RAIL REFER TYPICAL DRAWING No DND/A/ADV/1027-BAEL/2013/MISC./27 (2) PROVIDE CONCRETE CRASH BARRIER IN MEDIAN WHEREVER MEDIAN WIDTH IS LESS THAN OR EQUAL TO 2.50m. | | SCALE: DRAWN BY : I.C. DESIGNED BY : M.M. CHECKED BY : A.M. RECOMMENDED BY : A.R.M. APPROVED BY : H.R.B. | | TITLE: TYPICAL CROSS SECTION TYPE -32B & 32C TO BE ADOPTED IN GOVINDPUR DRG. NO.: DND/A/ADV/1027-BAEL/2013/ITCS/33 REVISION: R1 | |



TCS 34 : EXISTING 4 LANE WITH PROPOSED BOTH SIDES SERVICE ROAD

| TCS-Type | From (km) | To (km) | Length (m) |
|----------|-----------|---------|------------|
| TCS 34 | 407+000 | 409+050 | 2050 |
| | 427+320 | 428+950 | 1630 |
| TCS 34A | 409+050 | 409+700 | 650 |



TCS 34A : EXISTING 4 LANE WITH PROPOSED LHS SERVICE ROAD

| REV. | DATE | DESCRIPTION OF REVISIONS |
|------|----------|--------------------------|
| R0 | 29/11/22 | FOR INITIAL SUBMISSION |

CLIENT:

National Highways Authority of India
 (Ministry of Road Transport & Highways)
 Government of India

CONCESSIONAIRE:

IL&FS Transportation Networks Limited

INDEPENDENT ENGINEER:

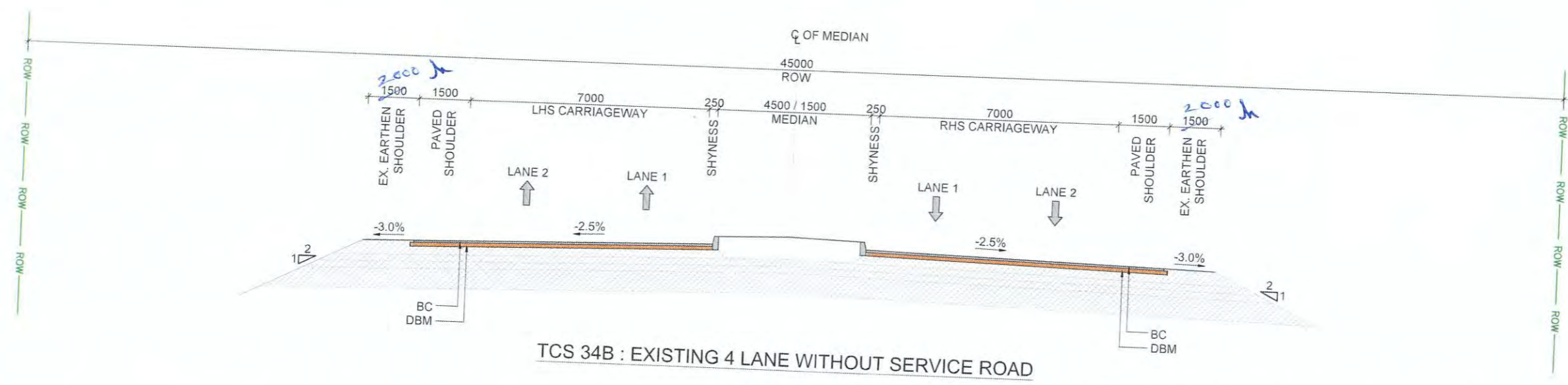
S.A. Infrastructure Consultants Pvt. Ltd.
 101-102 CS-4, Gayan Khand-II
 Indirampalpur, Ghaziabad - 201014

DESIGN CONSULTANT:

VR TECHNICHE Consultants Pvt.Ltd.
 1110, Tower A, Advant Navis Business Park
 # 7, Sector - 142, NOIDA - 201 305 (UP)
 Tel: +91-120-3303945 Web: www.vrtechniche.in

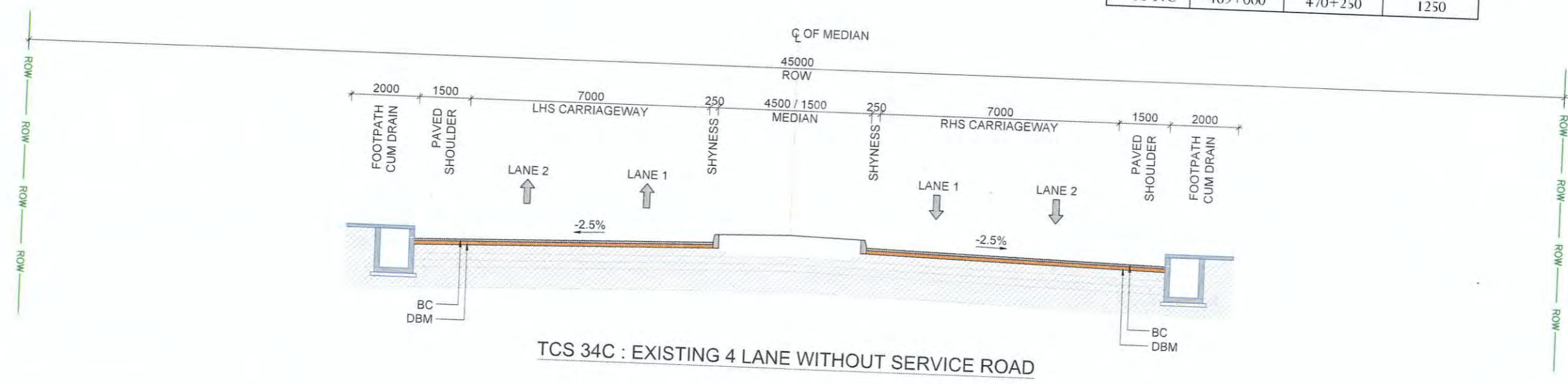
Drawn by: SHAFI
 Designed by: DHANANJAYA
 Checked by: SAI SUMAN
 Approved by: SAIDULU
 Scale: N.T.S
 Date: 29-11-2022
 Sheet size: A2

STATUS: FOR INITIAL SUBMISSION
 PROJECT: Six-laning of Barwa-Adwa-Panagarh Section of NH-2 from km 398.240 to km 521.120 including Panagarh Bypass in States of Jharkhand and West Bengal under NHDP Phase V on Toll on DBFOT Pattern
 TITLE: TYPICAL CROSS SECTIONS
 DRG No.: VRT/NHA/BAEL/TCS/001
 REV. R0 SHEET 1 of 3



TCS 34B : EXISTING 4 LANE WITHOUT SERVICE ROAD

| TCS-Type | From (km) | To (km) | Length (m) |
|----------|-----------|---------|------------|
| TCS 34B | 409+700 | 410+380 | 680 |
| | 426+800 | 427+320 | 520 |
| | 428+950 | 429+850 | 900 |
| TCS 34C | 469+000 | 470+250 | 1250 |



TCS 34C : EXISTING 4 LANE WITHOUT SERVICE ROAD


| REV. | DATE | DESCRIPTION OF REVISIONS |
|------|----------|--------------------------|
| R0 | 29/11/22 | FOR INITIAL SUBMISSION |

CLIENT:

National Highways Authority of India
 (Ministry of Road Transport & Highways)
 Government of India

CONCESSIONAIRE:

IL&FS Transportation Networks Limited

INDEPENDENT ENGINEER:

S.A. Infrastructure Consultants Pvt. Ltd.
 101-102, CS-1, Gayan Khand-II
 Indirampuram, Ghaziabad - 201014

DESIGN CONSULTANT:

VR TECHNICHE Consultants Pvt.Ltd.
 1110, Tower A, Advant Navis Business Park
 # 7, Sector - 142, NOIDA - 201 305 (UP)
 Tel: +91-120-3303945 Web: www.vrtechniche.in

| | | | |
|--------------|-----------|-------------|--|
| Drawn by: | SHAFI | STATUS: | FOR INITIAL SUBMISSION |
| Designed by: | RAJESH | PROJECT: | Six-laning of Barwa-Adda-Panagarh Section of NH-2 from km 398.240 to km 521.120 including Panagarh Bypass in States of Jharkhand and West Bengal under NHDP Phase V on Toll on DBFOT Pattern |
| Checked by: | SAI SUMAN | TITLE: | TYPICAL CROSS SECTIONS |
| Approved By: | SAIDULU | DRG No.: | VRT/NHAI/BAEL/TCS/002 |
| Scale: | N.T.S | Date: | 29-11-2022 |
| | | Sheet size: | A2 |
| | | REV. R0 | SHEET 2 of 3 |