



GOVERNMENT OF ODISHA
WORKS DEPARTMENT

CIVIL WORKS CONTRACT
[PACKAGE No. OSRP-Bal-P03]

For

***Widening & Strengthening of existing carriageway to 2-lane road from
Berhampur to Taptapani (Km. 0/0 to 41/0 of SH – 17)
(Balance Work)***

under

Odisha State Roads Project

between

**Chief Engineer, World Bank Projects, Odisha
on behalf of
Odisha Works Department, Government of Odisha**

and

**M/s RKD Construction Pvt. Ltd.,
B-20, Chandaka Industrial Estate,
Patia, Bhubaneswar**

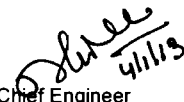
[VOLUME-I]

Agreement Value: Rs. 96,87,51,258.00

***Project Management Unit, Odisha State Roads Project
Office of the Engineer-in-Chief (Civil), Odisha,
Nirman Soudha, Keshari Nagar, Unit – V, Bhubaneswar – 751 001***

Dated: 4th January, 2013


M/s RKD Construction
Bhubaneswar


Chief Engineer
World Bank Projects, Odisha
EMPLOYEE
O/o the E.I.C.(Civil), Odisha
Bhubaneswar.

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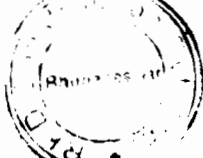
: Sections No.-1,2,3,4 & 6

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M/s RKD Construction
CONTRACTOR




4/1/13

Chief Engineer
World Bank Projects, Odisha Chief Engineer
EMPLOYEE World Bank Project
O/o the E.I.C.(Civil), Odisha
Bhubaneswar.



उड़ीसा ORISSA

E 436254

CIVIL WORKS CONTRACT

For

Widening & Strengthening of existing carriageway to 2-lane road from Berhampur to Taptapani (Km. 0/0 to 41/0 of SH - 17) (Balance Work) under Orissa State Roads Project

Agreement

This AGREEMENT, made the 4th day of January 2013, between Chief Engineer, World Bank Projects, Odisha on behalf of Odisha Works Department, Government of Odisha (hereinafter called "the Employer") of the one part and M/s RKD Construction Pvt. Ltd., B-20, Chandaka Industrial Estate, Patia, Bhubaneswar (hereinafter called "the Contractor") of the other part.

Whereas the Employer is desirous that the Contractor execute widening and Strengthening of Existing carriageway to 2 lane road from Berhampur to Taptapani(Km 0/0 to 41/0 of SH 17) (Balance Work) Agreement No. 8/2012-13 (hereinafter called "the Works") and the Employer has accepted the Bid by the Contractor for the execution and completion of such Works and the remedying of any defects therein, at a contract price of Rs.96,87,51,258.(Rupees Ninty Six Crore Eighty – Seven Lakhs Fifty one Thousand Two Hundred Fifty Eight) only.

NOW THIS AGREEMENT WITNESSETH as follows:


M/s RKD Construction Pvt. Ltd.
Contractor

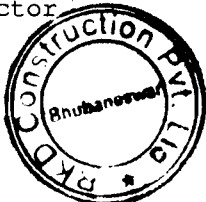


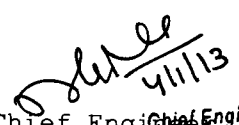
Shree
4/1/13
Chief Engineer
World Bank Project
E.T.C. (Civil), Odisha
Employer
Bhubaneswar.

1. In this Agreement, words and expression shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to, and they shall be deemed to form and be read and construed as part of this Agreement.
2. In consideration of the payments to be made by the Employer to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Employer to execute and complete the Works and remedy any defects therein in conformity in all aspects with the provisions of the Contract.
3. The Employer hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying the defects wherein the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.
4. The following documents shall be deemed to form and be read and construed as part of this Agreement, viz.:
 - i) Letter of Acceptance;
 - ii) Contractor's Bid;
 - iii) Contract Data;
 - v) Conditions of contract (including Special Conditions of Contract);
 - vi) Specifications;
 - vii) Drawings;
 - viii) Bill of Quantities

In witness whereof the parties thereto have caused this Agreement to be executed in accordance with the Laws of India on the day, month and year indicated above.


04/01/13.
M/s RKD Construction Pvt. Ltd.
Contractor




4/1/13
Chief Engineer
World Bank Project
E.I.C. (Civil), Odisha
Bhubaneswar.

For and on behalf of Employer, i.e Works Departments, Government of Odisha.

Odisha
4/1/13
Er. N. K. Pradhan
Chief Engineer,
World Bank Project, Odisha

For and on behalf of M/s RKD Construction Pvt. Ltd.

Rohan Das
04/01/13.
Rohan Das
Director,
M/s RKD Constructions Pvt. Ltd

Witness

- S. S. Dash*
04.01.13
1. Er. S. S. Dash
Fron RKD Construction Pvt.Ltd
 2. *Sukanta Kumar Patra*
Fron RKD Construction Pvt.Ltd
 3. *M. R. Misra*
Executive Engineer, PMU, OSRP, Bhubaneswar
 4. *Mr. Jaydev Mishra*
Sr. Divisional Accounts Officer,
PMU, OSRP, Bhubaneswar

M/s RKD Construction Pvt. Ltd.
Contractor

Rohan Das
4/1/13.


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Odisha
4/1/13
Chief Engineer
World Bank Projects
Employer

Chief Engineer
World Bank Project
O/o the E.I.C.(Civil), Odisha
Bhubaneswar.

GOVERNMENT OF ODISHA
WORKS DEPARTMENT

No. 12616/W., Bhubaneswar, Dated, the 24th December, 2012
EAP-76/12

From

Smt Manasi Dash,
AFA-cum-Under Secretary to Govt.

To

The Chief Engineer, World Bank Projects, Odisha.
Nirman Soudha, Bhubaneswar.

Sub:- Widening and Strengthening of existing carriage way to 2-Lane Road from Berhampur to Taptapani from Km 0/0 to Km 41/0 of SH-17(Balance Work).

Sir,

I am directed to invite a reference to your Letter No.37758 dated 06.11.2012 on the subject noted above and to convey the approval of Government to the lowest substantially responsive evaluated bid of M/s RKD Construction Pvt. Ltd. amounting to Rs.96,87,51,258.00 (Rupees Ninety Six Crore Eighty Seven Lakh Fifty One Thousand Two hundred Fifty Eight) only being 4.73% excess over the estimated cost of Rs.92,49,61,475.00 subject to the condition that the bidder shall propose the personnel with requisite qualification and experience prior to signing of contract.

A copy of the proceedings of the Tender Committee meeting held on 08.11.2012 for the above work is enclosed for reference.

Tender documents received with your letter under reference are returned herewith, the receipt of which may please be acknowledged.

Yours faithfully


AFA-cum-Under Secretary to Govt.

08
11/12


M/s RKD Construction
CONTRACTOR




Chief Engineer
World Bank Projects, Odisha
EMPLOYER

Chief Engineer,
World Bank Project
O/o the E.I.C.(Civil), Odisha
Bhubaneswar.

Chief Engineer, World Bank Projects, Orissa

From: <rrohatgi@worldbank.org>
To: "Chief Engineer World Bank Projects Orissa" <piuosrp@gmail.com>
Cc: <stadimalla@worldbank.org>; <kchoudhary@worldbank.org>;
<Orissa_State_Roads@worldbank.org>
Sent: Monday, November 05, 2012 4:35 PM
Subject: P03 Balance Work Award - No Objection

Dear Mr Pradhan

Thank you for sending the Bid Evaluation Report for Procurement of Civil Works for "Widening & Strengthening of existing carriageway to 2-lane road from Berhampur to Taptapani, from Km 0/0 to Km 41/0 of SH-17 (Balance Work)" under OSRP for Bank's review vide e-mail dated October 6, 2012 and subsequent clarifications dated October 26, 2012.

The Bid Evaluation Report along with the enquiry report prepared by OWD on complaint from M/s. Woodhill Infrastructure has been reviewed and we have "No Objection" to the PMU's recommendation for award of work for "Widening & Strengthening of existing carriageway to 2-lane road from Berhampur to Taptapani, from Km 0/0 to Km 41/0 of SH-17 (Balance Work)" to M/s. Rohit Kumar Das Construction Pvt. Ltd. at a total contract price of INR 968,751,258 (Rupees Nine hundred sixty eight million seven hundred fifty one thousand and two hundred fifty eight only).

Further to this, you are requested to send a reply to the complainant, M/s. Woodhill Infrastructure and share a copy of the reply with Bank.

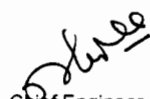
You are requested to kindly send copy of duly signed Contract Agreement along with prior review checklist for issuance of WBR No. for claiming disbursements.

Regards

Rajesh Rohatgi
Senior Transport Specialist
The World Bank
South Asia Sustainable Development Unit (Transport)
18-20, Kasturba Gandhi Marg,
New Delhi-110 001
Tel: 91-11-49247773 (Direct), 49247000 (Reception)
Fax: 91-11-49247639
Cell: 91-9818457485
rrohatgi@worldbank.org
www.worldbank.org/sartransport



M/s RKD Construction
CONTRACTOR



Chief Engineer
World Bank Projects, Odisha
EMPLOYER

Chief Engineer,
World Bank Project
O/o the E.I.C.(Civil), Odisha
Bhubaneswar.

**OFFICE OF THE ENGINEER-IN-CHIEF (CIVIL), ODISHA
NIRMAN SOUDHA, KESHARI NAGAR, UNIT – V, BHUBANESWAR – 751 001**

Letter No. PMU-WB-61/2012 – 44027

December 24, 2012

Letter of Acceptance

From

Er. Nalini Kanta Pradhan
Chief Engineer, World Bank Projects, Odisha
Tel.: +91 674 239 6783 / Fax.: +91 674 239 0080
Email: pmuosrp@gmail.com

To

The Managing Director
M/s RKD Construction Pvt. Ltd.,
B-20, Chandaka Industrial Estate,
Patia, Bhubaneswar
Email: rkdc@rkdcpl.com

Dear Sir,

This is to notify you that your Bid dated August 08, 2012 for execution of the Widening & Strengthening of existing carriageway to 2 lane road from Berhampur to Taptapani (Km 0/00 to Km 41/00 of SH-17) (Balance Work), Package No-OSRP-Bal-P03 for the Contract Price of Rs. 96,87,51,258/- (Rupees Ninety-six Crore Eighty-seven lakh Fifty-one thousand Two hundred and Fifty-eight) only as corrected in accordance with the Instructions to Bidders is hereby accepted by the undersigned with the condition that you shall propose the personnel with requisite qualification and experience prior to signing of contract.

We note that as per bid, you do not intend to subcontract any component of work.

You are hereby requested to furnish Performance Security in the form detailed in Para 34.1 of ITB for an amount of Rs. 4,84,38,000.00 (Rupees Four Crore Eighty-four lakh Thirty-eight thousand) only within 21 days of the receipt of this letter of acceptance valid upto 28 days from the date of expiry of Defects Liability Period i.e. upto 17.02.2016 and sign the contract, failing which action as stated in Para 34.3 of ITB will be taken.

We have reviewed the construction methodology submitted by you alongwith the bid in response to ITB Clause 4.3[k] and our comments are given in the attachment. You are requested to submit a revised Resource Based Work Program including environmental management plan as per Clause 27 of General Conditions of Contract within 14 days of receipt of this letter.

Encl: As above

Yours faithfully,


Chief Engineer
World Bank Projects, Odisha




Chief Engineer
World Bank Projects, Odisha
EMPLOYER

Chief Engineer
World Bank Project
O/o the E.I.C.(Civil), Odisha
Bhubaneswar

Contractor's Bid

Description of the Works:

Widening & strengthening of existing carriageway to 2-lane road from Berhampur to Taptapani (Km.0/00 to 41/00 of SH-17) (Balance Work)

BID: PMU-WB-61/2012-18418

TO

**The Chief Engineer,
World Bank Projects,
Nirman Soudha, Keshari Nagar,
Unit - V, Bhubaneswar- 751001, Odisha.
Bhubaneswar.**

GENTLEMEN,

Having examined the bidding documents including addendum, we offer to execute the Works described above in accordance with the Conditions of Contract, Specifications, Drawings and Bill of Quantities accompanying this Bid for the Contract Price of **DETAILS MENTIONED IN BOQ.**

The advance Payment required is: Rupees **5% of the accepted value.**

We accept the appointment of **Shri Bhaskar Chandra Hota** as the Adjudicator.


This Bid and your written acceptance of it shall constitute a binding contract between us. We understand that you are not bound to accept the lowest or any Bid you receive.

We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf will engage in bribery.

We also undertake that, in competing for (and, if the award is made to us, in executing) the above contract, we will strictly observe the laws against fraud and corruption in force in India namely "Prevention of Corruption Act 1988".


Commissions or gratuities, if any, paid or to be paid by us to agents relating to this Bid, and to contract execution if we are awarded the contract, are listed below:




Managing Director
RKD Construction Pvt. Ltd.




Chief Engineer
World Bank Projects, Odisha
EMPLOYER


M/s RKD Construction
CONTRACTOR


Name and address of agent

Amount

Purpose of Commission or gratuity

NOT APPLICABLE

We hereby confirm that this Bid complies with the Eligibility, Bid Validity and Bid Security required by the Bidding documents.

Yours faithfully,


Managing Director
RKD Construction Pvt. Ltd.
Authorized Signature:

Mr. Rohit Kumar Das

Managing Director

Name & Title of Signatory:


Name of Bidder: **RKD Construction Pvt.Ltd.**

Address: **B-20, Chandaka Industrial Estate
Patia, Bhubaneswar-751024.**



M/s RKD Construction
CONTRACTOR




Chief Engineer
World Bank Projects, Odisha
EMPLOYER

Chief Engineer
World Bank Project
O/o the E.I.C.(Civil), Odisha
Bhubaneswar.

STATE BANK OF INDIA
COMMERCIAL BRANCH
UNIT-II, ASHOK NAGAR
BHUBANESHWAR, ORISSA

TEL NO:
FAX NO:0674-2530803
SWIFT NO:SBININBB119
PIN CODE:751009

THE CHIEF ENGINEER
WORLD BANK PROJECTS
ODISHA, BHUBANESHWAR
751001

01/01/2013

AGM (C)
SBI, Com
Bhubaneswar

2686 / 01-01-2013

DEAR SIRs,

GUARANTEE NO :0665713BG00C0001
AMOUNT OF GUARANTEE :INR4,84,38,000.00
GUARANTEE COVER FROM :01/01/2013 TO 17/02/2016
LAST DATE FOR LODGEMENT OF CLAIM :17/02/2016

THIS DEED OF GUARANTEE IS EXECUTED BY THE STATE BANK OF INDIA,
CONSTITUTED UNDER THE STATE BANK OF INDIA ACT , 1955 HAVING THE CENTRAL OFFICE
AT NARIMAN POINT , MUMBAI AND AMOUNGST OTHER PLACES. A BRANCH AT
COMMERCIAL BRANCH HEREIN AFTER REFERRED TO AS 'THE BANK'). IN
FAVOUR OF THE CHIEF ENGINEER
(HEREIN AFTER REFERRED TO AS 'BENEFICIARY') FOR AN AMOUNT NOT EXCEEDING
INR 4,84,38,000.00
Rupees four crore eighty four lakh thirty eight thousand only

AT THE REQUEST OF RKD CONSTRUCTION PVT LTD
AND THE GUARANTEE SHALL REMAIN IN FULL FORCE UPTO 17/02/2016
AND CANNOT BE INVOKED OTHERWISE THAN BY WRITTEN DEMAND OR CLAIM UNDER THIS
GUARANTEE SERVED ON THE BANK ON OR BEFORE THE 17/02/2016

SUBJECT TO AS AFORESAID

NOTWITHSTANDING ANYTHING CONTAINED HEREIN ABOVE, OUR LIABILITY UNDER THIS
GUARANTEE IS RESTRICTED TO
INR 4,84,38,000.00
Rupees
four crore eighty four lakh thirty eight thousand only

OUR GUARANTEE SHALL REMAIN IN FORCE UNTIL 17/02/2016. UNLESS A DEMAND OR
CLAIM UNDER THE GUARANTEE IS MADE ON OUR BANK IN WRITING ON OR BEFORE
17/02/2016 ALL YOURS RIGHTS UNDER THE SAID GUARANTEE BE FORFEITED AND WE SHALL
BE RELIEVED AND DISCHARGED FROM ALL LIABILITES THEREUNDER.

AUTHORISED SIGNATORY



AUTHORISED SIGNATORY
Murchhana Sahoo
S-15602

PLEASE CONTACT BRANCH FOR eTradeSBI FACILITY-INTERNET ACCESS TO TRADE FINANCE

प्रभुदत्त बल
PRABHUDATTA BAL
S.S.No:P-5614

3 (three)



Chief Engineer
World Bank Projects, Odisha
EMPLOYER

Chief Engineer
World Bank Project
O/o the E.I.C.(Civil), Odisha
Bhubaneswar.



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PERFORMANCE BANK GUARANTEE

E 155276

Enclosure to Bank Guarantee No.-

BG NO.0665713BG0000221

PAGE NO...1/3.....

Date- 01/01/2013


To,
The Chief Engineer,
World Bank Projects, Odisha,
Bhubaneswar.

WHEREAS M/S. RKD CONSTRUCTION (P) LTD., B/20, Chandaka Industrial Estate, Patia, Bhubaneswar-24 (Name & address of Contractor) (herein after called "the Contractor") has undertaken, to execute "Widening & strengthening of existing carriageway to 2-lane road from Berhampur to Taptapani (Km 0/0 to 41/0 of SH - 17) (Balance work), Package No - OSRP-Bal-P03" (Name of contract and brief description of works) (hereinafter called "the Contract").

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish you with a Bank Guarantee by a recognized bank for the sum specified therein as security for compliance with his obligations in accordance with the Contract;

AND WHEREAS we have agreed to give the Contractor such a Bank Guarantee.

Contd.... P/2


प्रभुदत्त बाल
PRABHUDATTA BAI
S.S.No:P-561A




Murchhana Sahoo
S-15602


M/s RKD Construction
CONTRACTOR


Chief Engineer
World Bank Projects, Odisha
EMPLOYER

Chief Engineer
World Bank Project
O/o the E.I.C.(Civil), Odisha
Bhubaneswar.

BG NO.0665713BG0000221
PAGE NO. 2/3

-: P2: -

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Contractor, up to a total of Rs.4,84,38,000/- (amount of Guarantee) Rupees Four crores Eighty-four lacs Thirty-eight thousand only (in words), such sum being payable in the types and proportions of currencies in which the Contract price is payable, and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of Rs.4,84,38,000/- (amount of Guarantee) as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein. Provided such claim is made on or before 17/02/2016.

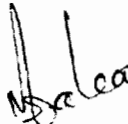
We hereby waive the necessity of your demanding the said debt from the Contractor before presenting us with the demand.

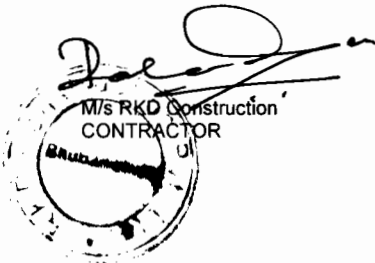
We further agree that no change or addition to or other modification of the terms of the Contract or of the works to be performed there under or of any of the Contract documents which may be made between your and the Contractor shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

Contd...P/3


प्रभुदत्त बाले
PRABHUDATTA BAI
S.S.No:P-561/




Murchhana Sahoo
S-15602




Chief Engineer
World Bank Projects, Odisha
EMPLOYER

Chief Engineer,
World Bank Project
O/o the E.I.C.(Civil), Odisha-
Bhubaneswar

BG NO.0665713BG0000001
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-: P3: -

This guarantee shall be valid until 17/02/16 i.e., 28 days from the date of expiry of the defect liability period. The date of expiry of such defect liability period will be not later than 20/01/2016

“Not withstanding any thing contained therein:

a) Our liability under this Bank Guarantee shall not exceeds Rs.4,84,38,000.00 (Rupees Four crores Eighty-four lacs Thirty-eight thousand) only.

b) This Bank Guarantee shall be valid up to 17/02/2016

“We are liable to pay the guaranteed amount or any part there of under this Bank Guarantee only and only if a written claim or demand is served on us or before 17/02/2016 .

SIGNATURE AND SEAL

NAME OF THE BANK - State Bank of India
ADDRESS - Commercial Branch, Unit



Murchhana Sahoo

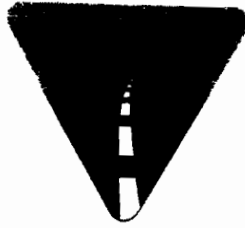
DATE - 01/01/2013

प्रमुदत बल
PRABHUDATTA BAI
S.S.No:P-5614

Murchhana Sahoo
S-15602



Devi
Chief Engineer
World Bank Projects, Odisha
EMPLOYER
Chief Engineer,
World Bank Project
O/o the E.I.C.(Civil), Odisha-
Bhubaneswar.



Resolutions to be passed at a meeting of the Board of Directors of the RKD Construction Private Limited on January 4, 2013 to sign agreement & to comply all the formalities thereof on behalf of us:

The Chairman/Managing Director informed the Board that we have bagged work order from The Chief Engineer, World Bank Projects, Odisha, Bhubaneswar for the work "Widening & strengthening of existing carriageway to 2 lane road from Berhampur to Taptapani (Km 0/00 to Km 41/00 of SH-17) (Balance work), Package No – OSRP- Bal – P03".

After due discussions, the following resolutions were passed.

RESOLVED

1. THAT Shri Rohan Das, Director of the company be and is hereby authorized to sign, execute agreement with The Chief Engineer, World Bank Projects, Odisha, Bhubaneswar for the work "Widening & strengthening of existing carriageway to 2 lane road from Berhampur to Taptapani (Km 0/00 to Km 41/00 of SH-17) (Balance work), Package No – OSRP- Bal – P03".
2. THAT Sri Rohan Das, Director of the Company is hereby authorized to sign such agreement on behalf of this company i.e., RKD Construction (P) Ltd.

CERTIFIED TO BE TRUE

FOR RKD CONSTRUCTION (P) LTD


(MANAGING DIRECTOR)
Managing Director
RKD Construction Pvt. Ltd

RKD CONSTRUCTION PVT. LTD.

CORPORATE OFFICE : B-20, CHANDAKA INDUSTRIAL ESTATE, PATIA, BHUBANESWAR - 751024
BRANCH OFFICE : B/3, BARAMUNDA BDA, DUPLEX COLONY, BHUBANESWAR - 751003

☎ : (0674) 3056565 (O), Fax : (0674) 2725402,
E-mail : rkd@rkdpl.com, Website : www.rkdpl.com



For RKD Construction
CONTRACTOR


Chief Engineer
World Bank Projects, Odisha
EMPLOYER

Chief Engineer
World Bank Project
O/o the E.I.C.(Civil), Odisha
Bhubaneswar.

26/12/2012



Regd. No.-4372003
उड़ीसा ORISSA

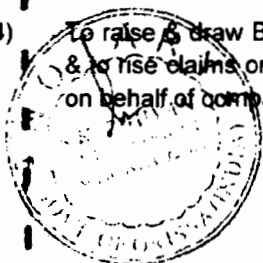
Sarat Kumar Bhuyan
NOTARY, BHUBANESWAR 436252
Govt. of Orissa (India)
Regd. No.-4372003

GENERAL POWER OF ATTORNEY

Know all men by this Power of Attorney that I, Rohit Kumar Das, aged about 58 years, S/o Late Pravakar Das, in the capacity of managing Director of M/s RKD Construction Pvt. Ltd, B-20, Chandaka Industrial Estate, Bhubaneswar do here by appoint Sri Rohan Das, Director, aged about 26 years, S/o Sri Rohit Kumar Das, 783-B, Jayadev Vihar, Dist- Khurda, as the lawful attorney to act on behalf of the company to do all or any of the acts and contractors for the works.

- 1) To purchase & sign the tender Documents in our name and on our behalf.
- 2) To sign the agreement papers for the works in our name and on our behalf.
- 3) To represent our company in meetings related to submission and opening of tenders including taking participation or remedying any defects in the tender application in our name and on our behalf.
- 4) To raise & draw Bills, to sign the measurement books on behalf of the company & to rise claims on bills & to collect the proceeds thereof against proper receipts on behalf of company.

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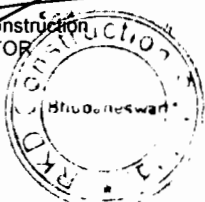




Managing Director
RKD Construction Pvt. Ltd.





M/s RKD Construction
CONTRACTOR




Chief Engineer
World Bank Projects, Odisha
EMPLOYER

Chief Engineer
World Bank Project
O/o the E.I.C.(Civil), Odisha
Bhubaneswar.

Sarat Kumar Bhuyyan
26/12/12
Sarat Kumar Bhuyyan
NOTARY, BHUBANESWAR
Govt. of Orissa (India)
Regd. No. 43/2003

- 5) To deposit Earnest Money/ Security when and where necessary to get contract of such deposits in our name and on our behalf.
- 6) To receive bills, Cheques, Drafts and Cash from the authorities receipt our contract works, in our name and on our behalf.

I Sri Rohit Kumar Das undertake to ratify and confirm all acts, deeds and things to be done by our attorney by virtue of this Power of Attorney which can be revoked at any time.

IN WITNESS WHEREOF I HAVE SIGNED THIS ON 1st day of January 2013.

WITNESS:

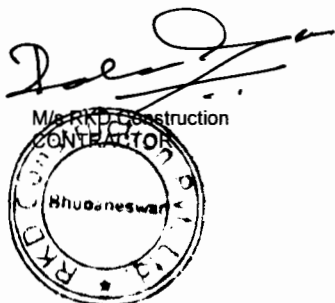
- 1. *Srinanta Kumar Patra*
182/A, Barramunda,
Bhubaneswar.
- 2. *Debasish Dash*
H-118, Sailashree Vihar
Bhubaneswar

P.K.
26/12/12
Managing Director
RKD Construction Pvt. Ltd.
Executant

Rohit Kumar Das
Attorney Holder

Attested

Sarat Kumar Bhuyyan
26/12/12
Sarat Kumar Bhuyyan
NOTARY, BHUBANESWAR
Govt. of Orissa (India)
Regd. No. 43/2003



[Signature]
Chief Engineer
World Bank Projects, Odisha
EMPLOYER

Chief Engineer.
World Bank Project
O/o the E.I.C.(Civil), Odisha
Bhubaneswar.



SRB & Associates
 CHARTERED ACCOUNTANTS

5TH FLOOR, IDCO TOWER, JANAPATH,
 BHUBANESWAR - 751 022, ORISSA
 TEL : 0674 - 2541043, 2545000
 FAX : 01- 674 - 2546414
 Email: srbbor@vsnl.net

NEW DELHI - 011-51601863
 KOLKATA - 033-30930875
 SECUNDERABAD - 040-27510739

TO WHOMSOEVER IT MAY CONCERN

This is to certify that , the turnover of M/S RKD Construction Private Limited, B-20, Chandaka Industrial Estate, Patia Bhubaneswar - 751024 for the last Five Years are as under. The total turnover is from Civil works Contract business only.

<u>Sl. No.</u>	<u>Financial Year</u>	<u>Amount (In Rs.)</u>
01.	2011-12	217,05,62,287.00 (Prov.)
02.	2010-11	171,40,48,773.50
03.	2009-10	170,90,04,343.00
04.	2008-09	124,66,83,232.30
05.	2007-08	90,39,30,958.00

SRB & Associates
 Chartered Accountants

Kumar Patra, FCA

(Partner)

M.N-88484

Bhubaneswar

15.05.2012



Managing Director
 RKD Construction Pvt. Ltd.

1.5 LIST OF KEY PLANT & EQUIPMENT TO BE DEPLOYED ON CONTRACT WORK

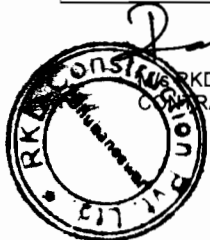
M/s RKD Construction
 CONTRACTOR



Chief Engineer
 World Bank Projects, Odisha
 EMPLOYER

Chief Engineer
 World Bank Project
 O/o the E.I.C.(Civil), Odisha
 Bhubaneswar.

Items of Equipment	Requirement		Availability Proposals			Remarks (from whom to be purchased)
	No	Capacity	Owned/Leased /to be procured	Nos./Capacity	Age/Condition	
Mechanical Bitumen Sensor Paver 100 TPH	01	-	Owned	1	033 Dt.08.05.2008	-
Motor Grader	02		Owned	4	IM0100003877 Dt: 17.10.2011 592612216 Dt: 01.07.2009 628177822 Dt: 14.09.2010 B-037 Dt:01.06.2007	
Hydraulic Excavator	02		Owned	2	12509318 Dt: 27.02.2007 12519414 Dt:31.10.2009	
Vibratory Roller	02		Owned	2	431854 Dt: 21.02.2009 VA 0084 Dt: 29.04.2008	
Pneumatic Tired Roller	01		Owned	1	006/12-13 Dt: 02.06.2012	
Hot Mix Plant (Batch Mix)	01		Owned	1	327 Dt:02.01.2009 M/124 Dt:26.08.2011	
Concrete Batch Mix Plant 100 TPH	01		Owned	1	85153289 Dt: 04.04.2012	
Transit Mixer	02		Owned	2	44/44/671/CM6/M/U/6T2 Dt: 03.01.2002 8540214 Dt: 22.06.2011	
Front end Loader	02		Owned	2	9031001443 Dt:28.03.2009 IM5200000871 Dt: 16.04.2012 6610010209 Dt:19.02.2007 IM5200000870 Dt:16.04.2012	
Dozer	01		Owned	4	1171001052 Dt:28.04.2008 305065 Dt:05.07.2010 1171001034 Dt:21.04.2008 1171001468 Dt:30.9.2008	
			Owned	1	OR-02-BA-5965	
			Owned	1	OR-02- BA-2865	
			Owned	1	OR-02-BA-3165	
			Owned	1	OR-02-BA-2965	
			Owned	1	OR-02-BA-2665	
			Owned	1	OR-02-BA-2465	



RKV Construction
CONTRACTOR


Chief Engineer
World Bank Projects, Odisha
EMPLOYER

Chief Engineer
World Bank Project
No. 100, E.P. Road, Cuttack,
Odisha

Tipper	25		Owned	1	OR-02-BT-7665	
			Owned	1	OR-02-BA-6665	
			Owned	1	OR-02-BT-8065	
			Owned	1	OR-02-BA-6065	
			Owned	1	OR-02-BT-2765	
			Owned	1	OR-02-BA-3065	
			Owned	1	OR-02-AW-6835	
			Owned	1	OR-02-BA-6265	
			Owned	1	OR-02-BB-6265	
			Owned	1	OR-02-BA-6165	
			Owned	1	OR-02-BC-8965	
			Owned	1	OR-02-BA-2565	
			Owned	1	OR-02-AW-6765	
			Owned	1	OR-02-BB-5965	
			Owned	1	OR-02-BB-5765	
Owned	1	OR-02-AW-6805				
Owned	1	OR-02-BT-8165				
Owned	1	OR-02-BT-7965				
Owned	1	OR-02-BT-7865				
Cone Crushing Unit 200 TPH	01		Owned	1	M/341 Dt: 22/02/2012 Puzlona crusher Invoice No. (s) 1571,1572,1584, 2019,2020,2028, 2061,2462,2063, 2110,2217,2255,2265, 2280,2346,2347	
Bitumen Sprayer	01		Owned	2	Mfg-341 Dt:16.11.2010 Mfg-344 Dt: 16.11.2011	
Earth Compactor	02		Owned	3	VA 0083 Dt: 29.04.2008 09NA0021 Dt: 29.11.2008 01622 Dt:27.11.2008	
Water Tanker	03		Owned	5	538 Dt: 25.11.2008 2165/11 Dt: 04.02.2011	
Mechanical Paver	01		Owned	1	Mfg-339 Dt:19.01.2011	
WMM Plant (80-100 TPH Capacity)	01		Owned	2	07/09-10 08/09-10 Dt:18.05.2009	
Concrete Pump	01		Owned	1	85004746 Dt:27.02.2010	




M/s RKD Construction
CONTRACTOR



Chief Engineer
World Bank Projects, Odisha
EMPLOYER



1.6 QUALIFICATION AND EXPERIENCE OF KEY PERSONNEL

SL No.	Position	Name	Qualification	Year of Experience (General)
1	Project Manager	S.P.Gupta	B.Sc. Engg (Civil)	35 Years
2	Highway Engineer	Panchanan Das	B.E (Civil)	18Year
3	Bridge Construction Engineer	Amar Kumar Patra	A.M.I.E (Civil)	24Year
4	Material Engineer	Gorachand Satpathy	B.Sc. Engg (Civil)	40Years
5	Quantity surveyor	Mihir Kumar Jena	Diploma (Civil)	12 Years
6	Mechanical Equipment maintenance engineer	Subrata Kumar Khadanga	Diploma (Mech.)	8 Year
7	Environment & Safety officer	Sudam Nayak	Diploma in Fire & Safety	4 Years


M/s RKD Construction
CONTRACTOR




Chief Engineer
World Bank Projects, Odisha
EMPLOYER

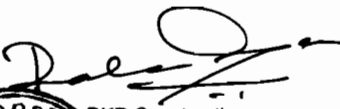

Chief Engineer
World Bank Project
to the E.I.C.(Civil), Odisha
Bhubaneswar.



turnover in the last five years : 2007-2008 <> Rs. 90, 39, 30,958.00
 2008-2009 <> Rs. 124, 66, 83,232.00
 2009-2010 <> Rs. 170, 90, 04,343.00
 2010-2011 <> Rs. 171, 40, 48,773. 50
 2011-2012 <> Rs. 217, 05, 62, 287.00 (Prov.)

**BALANCE SHEET &
 C.A Certificate Attached**


 Managing Director
 RKD Construction Pvt. Ltd.


 RKD Construction
 CONTRACTOR



 Chief Engineer
 World Bank Projects, Odisha
 EMPLOYER
 Chief Engineer
 World Bank Project
 O/o the E.I.C.(Civil), Odisha
 Bhubaneswar.

TO WHOMSOEVER IT MAY CONCERN

This is to certify that, the turnover of M/S RKD Construction Private Limited, B-20, Chandaka Industrial Estate, Patia Bhubaneswar - 751024 for the last Five Years are as under. The total turnover is from Civil works Contract business only.

<u>S. No.</u>	<u>Financial Year</u>	<u>Amount (In Rs.)</u>
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04.	2008-09	124,66,83,232.30
05.	2007-08	90,39,30,958.00

For SRB & Associates
 Chartered Accountants


Ajit Kumar Patra, FCA
 (Partner)
 M.N-88484
 Bhubaneswar
 Date: 15.05.2012






Managing Director
RKD Construction Pvt. Ltd.




 M/s RKD Construction
 CONTRACTOR


 Chief Engineer
 World Bank Projects, Odisha
 EMPLOYER
 Chief Engineer
 World Bank Project
 O/o the E.I.C.(Civil), Odisha
 Bhubaneswar.

ଭାରତୀୟ ଷ୍ଟେଟ୍ ବ୍ୟାଙ୍କ
 भारतीय स्टेट बैंक
 State Bank of India

The Chief Engineer,
 World Bank Projects, Odisha,
BHUBANESWAR.

791

ଭାରତୀୟ ଷ୍ଟେଟ୍ ବ୍ୟାଙ୍କ
 ଭୁବନେଶ୍ୱର ଶାଖା
 ପ୍ଲଟ୍-2, ଅଶୋକ ନଗର
 ଭୁବନେଶ୍ୱର - 751 009
 ଡିଷ୍ଟ୍ରିକ୍ଟ - ଖୁର୍ଦା (ଓଡ଼ିଶା)
 ଟାଲ - କୋମଳାନ
 ଇ-ମେଲ : sbi.06657@sbi.co.in
 ଫୋନ୍ : 91-674-2539189, 2530803
 ଫକ୍ସ ନମ୍ବର : SBININBB119
 କୋଡ୍ ନଂ : 6657
 ଫୋନ୍ ନଂ : 2534012, 2531808, 2534009

ବାଣିଜ୍ୟିକ ଶାଖା
 ଇଡିକଲ ହାଉସ୍
 ପ୍ଲଟ୍-2, ଅଶୋକ ନଗର,
 ଭୁବନେଶ୍ୱର - 751 009
 ଜିଲ୍ଲା- ଖୁର୍ଦା (ଓଡ଼ିଶା)
 ଟାଲ - କୋମଳାନ
 ଇ-ମେଲ : sbi.06657@sbi.co.in
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 କୋଡ୍ ନଂ : 6657
 ଫୋନ୍ ନଂ : 2534012, 2531808, 2534009

COMMERCIAL BRANCH
 IDCOL House
 Unit-II, Ashok Nagar
 Bhubaneswar - 751 009
 Dist. : Khurda (Odisha)
 Tel. Address : COMMBRAN
 E-MAIL : sbi.06657@sbi.co.in
 Fax : 91-674-2539189, 2530803
 SFMS : SBININBB119
 Code No. : 6657
 Ph.No. : 2534012, 2531808, 2534009

ଦ୍ରବ୍ୟ
 କ୍ରମାଙ୍କ
 No. CBB/RM-11/15/147

ତାରିଖ
 ଦିନାଙ୍କ
 Date : 7/8/12

BANK CERTIFICATE

is to certify that M/S. RKD CONSTRUCTION (P) LTD is a reputed company
 a good financial standing and is banking with us.
 e contract for the work namely "Widening & Strengthening of existing
 geway to 2-lane road from Berhampur to Taptapani from Km 0/0 to Km 41/0 of
 7 (Balance Work) (funded by the World Bank)" is awarded to the above
 any, we shall be able to provide overdraft/credit facilities to the extent of
 0.00 millions(Rs 15.00 Crs) to meet their working capital requirements for
 ating the above contract during the contract period.

[Signature]
 Relationship Manager (II)



[Three handwritten signatures]

[Signature]
 M/S. RKD Construction
 CONTRACTOR

[Signature]
 Chief Engineer
 World Bank Projects, Odisha
 EMPLOYER
 Chief Engineer:
 World Bank Project
 O/o the E.I.C.(Civil), Odish
 Bhubaneswar.



Karnataka Bank Ltd.

(Head Office: Mahaveera Circle, Kanaknagar, Mangalore - 575 002)
HO-CREDIT - LARGE & CORPORATE FINANCE DIVISION

CREDIT SANCTION INTIMATION

Sanction Ref.No. CMS LCFD 6/09-10 dtd 13.04.09	Date: 13.04.2009
From: The Branch Head, Branch: Bhubaneswar,	Mail to: M/s. RKD Construction Pvt. Ltd B/3, Baramunda B.D.A. Duplex Colony, Bhubaneswar - 751 003

Re: Your Proposal For Credit Facilities.

With reference to the above, we are pleased to inform sanction of the following fresh credit facilities along with terms & conditions of the sanction for the purpose of working capital.

It is to be clearly understood that these facilities are sanctioned subject to the convenience of the Bank and may be cancelled at any time without prior notice before making available the sanctioned facilities. The Bank may revoke in part or in full or withdraw/stop financial assistance at any stage, without any notice or giving any reasons for any purpose whatsoever.

We request you to return one copy duly signed at the relevant space in token of having accepted the facilities sanctioned to you with all the terms and conditions stipulated therein.

On receipt of the copy of credit sanction intimation duly signed by you and on your executing the necessary loan/security documents along with co-obligants/guarantors, furnishing all necessary particulars, required if any, we will arrange to release the facilities.

Rate of interest subject to change from time to time.

FOR KARNATAKA BANK LTD.
 Authorizing Manager / Chief Manager
 Senior Branch Manager

CREDIT FACILITIES SANCTIONED:

NATURE OF FACILITY AND LIMITS:

1. Overdraft limit of Rs. 500.00 lakhs. (Rs. Five hundred lakhs)
2. Bank Guarantee of Rs. 500.00 lakhs (Rs. Five hundred lakhs)

Under multiple banking arrangements with State Bank of India, commercial branch, Bhubaneswar on pari-passu basis

RATE OF INTEREST / COMMISSION:

1. For OD: PLR presently 14.00 % p.a.
2. For BG: Commission at 1.50 % p.a.

Managing Director
RKD Construction Pvt. Ltd.

MANAGING DIRECTOR
RKD CONSTRUCTION (P) LTD.



Handwritten signature

Chief Engineer
World Bank Projects, Odisha

EMPLOYER
Chief Engineer
World Bank Project
O/o the E.I.C. (Civil), Odisha
Bhubaneswar.

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Proposed sub-contracts and firms involved [Refer ITB Clause 4.3(k)]

69


Part of the work	Value of sub-contact	Sub-Contractor (Name & Address)	Experience in similar work
NIL			

Pab
 MANAGING DIRECTOR
 R.K.D.CONSTRUCTION PVT. LTD.

[Handwritten marks]

[Handwritten mark]

[Signature]
 R.K.D. Construction
 MANAGING DIRECTOR



[Signature]
 Chief Engineer
 World Bank Projects, Odisha
 EMPLOYER
 Chief Engineer
 World Bank Project
 O/o the E.I.C.(Civil), Odisha
 Bhubaneswar.

Monthly Wholesale Price Index Base Year 2004-05 = 100

Name of Commodity : Bitumen
Type : Individual Commodity
Weight : 0.15515

Month/Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2012	334.1	326.1	316.4	311.7	318.7	324.7	325.4	324.2	325	282.6	270.8	
2011	251.3	252.2	256.7	279.3	289.1	293.9	277.4	284.2	295.9	312.1	315.3	327.4
2010	256.1	249.6	257.4	256.1	254.5	249.6	251.5	250.8	244.6	237	238.4	250.3
2009	225.8	228.8	222.7	226	217.7	214.6	219.3	222.6	240	253.1	250.4	249.7

1. Figure 9999.9 may be treated as index for particular item not-available
2. Figures for the latest two months are provisional. Latest two months are to be reckoned with reference to the latest monthly press release issued.

Senior Economic Adviser,
Room No. 126-E, Ministry of Commerce and Industry,
Lodging Bhawan, Rafi Marg, New Delhi - 110 011, INDIA
Telephone : 91-11-2306 2721 Fax : 91-11-2306 3103
E-mail to the Senior Economic Adviser



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Economic Adviser, Ministry of Commerce and Industry, Government of India

Page 27

[Signature]
M/s. RKD Construction
CONTRACTOR



[Signature]
Chief Engineer
World Bank Projects, Odisha
EMPLOYER
Chief Engineer
World Bank Project
O/o the E.I.C.(Civil), Odisha
Bhubaneswar.

Monthly Wholesale Price Index

Base Year 2004-05 = 100



Name of Commodity : c. CEMENT & LIME
Type : Group Item
Weight : 1.38646

Month/Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2012	160.1	160.5	163.1	164.9	164.9	167.5	169.5	171.6	171.1	171.3	169.3	
2011	148.3	151.2	153.7	154.3	155.3	153.6	153	151.9	152.5	157.5	160.6	161.3
2010	147.8	150.5	151.2	151.6	152.2	150.2	153.4	151.4	150.2	151.4	148.4	148.1
2009	141.9	144.3	147.8	148.1	147.7	149.4	149.6	149.5	149.2	150.2	148.5	146.5

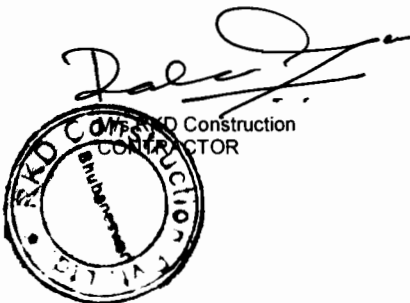
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Senior Economic Adviser,
 Room No. 124-E, Ministry of Commerce and Industry,
 Lutyens Bungalow, Rais Marg, New Delhi - 110 011, INDIA
 Telephone : 91-11-2308 2721 Fax : 91-11-2306 3562
 E-Mail to the Senior Economic Adviser



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 Chief Engineer
 World Bank Projects, Odisha
 EMPLOYER

Chief Engineer
 World Bank Project
 O/o the E.I.C.(Civil), Odisha
 Bhubaneswar

Monthly Wholesale Price Index

Base Year 2004-05 = 100

Name of Commodity : Steel Rods
Type : Individual Commodity
Weight : 0.08639

Month/Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2012	143.5	144.9	144.7	148.8	149	150.7	150.7	146.2	143.6	146.2	142.3	
2011	136	141.1	137.8	138.2	138.2	139.3	139.3	139.6	135.4	140	140.4	142.7
2010	141.2	140.7	138.3	137.1	132.8	133.7	133.7	133.7	132.4	132.8	132.8	132.2
2009	144.5	144.5	144.5	144.5	144.5	144.5	144.5	144.5	144.5	144.5	144.5	138.2

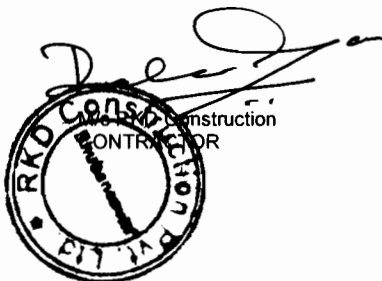
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Disclaimer



[Signature]
 Chief Engineer
 World Bank Projects, Odisha
 EMPLOYER

Chief Engineer:
 World Bank Project
 O/o the E.I.C. (Civil), Odisha,
 Bhubaneswar

Indian Oil Corporation Limited

304, BHOI NAGAR, BHUBANESWAR-751022
 TEL: 0674-2543381, 2546821, FAX: 2541638, 2543381
 E Mail: ppadma@indianoil.in/dmahapatra@indianoil.in



IndianOil

To,

REF: OSO/CS/ PRICING
 DATE: 16.12.2012

SUB: PRICE OF BITUMEN

Dear Sir

We are giving below the Price of Bitumen for the following periods Ex- Haldia:

Basic Price in Rs./MT Ex-Haldia w.e.f.	BULK 80/100 (VG-10)	BULK 60/70 (VG-30)	BULK 30/40 (VG-40)	PACKED 80/100 (VG-10)	PACKED 60/70 (VG-30)	PACKED 30/40 (VG-40)	EMULSION RS	CRMB-50	CRMB-55	CRMB-60
01.04.12	33480.00	34280.00	36990.00	36580.00	37380.00	39690.00	25090.00	34260.00	34440.00	34420.00
16.04.12	33560.00	34360.00	36110.00	36660.00	37460.00	39210.00	24820.00	34330.00	34510.00	34490.00
01.05.12	34340.00	35140.00	37000.00	37440.00	38240.00	40100.00	28330.00	35090.00	35260.00	35230.00
16.05.12	34770.00	35570.00	37500.00	37870.00	38670.00	40600.00	28620.00	35480.00	35650.00	35610.00
01.06.12	34930.00	35730.00	38180.00	38030.00	38830.00	41280.00	28690.00	35590.00	35740.00	35690.00
16.06.12	34940.00	35740.00	38278.00	37940.00	38740.00	41270.00	28590.00	35500.00	35650.00	35600.00
01.07.12	34940.00	35740.00	38278.00	38040.00	38840.00	41270.00	29048.00	36008.00	36750.00	35700.00
16.07.12	34870.00	35470.00	37960.00	37670.00	38470.00	40960.00	28600.00	35250.00	35410.00	35360.00
01.08.12	36568.00	37368.00	39988.00	39668.00	40468.00	43088.00	30598.00	37178.00	37318.00	37258.00
16.08.12	33598.00	34398.00	36578.00	36698.00	37498.00	39678.00	28568.00	34448.00	34648.00	34648.00
01.10.12	31128.00	31928.00	33738.00	34228.00	35028.00	33738.00	26688.00	32178.00	32428.00	32468.00
16.10.12	29868.00	29408.00	30828.00	31708.00	32508.00	33928.00	24968.00	29858.00	30158.00	30258.00
01.11.12	30868.00	31468.00	33158.00	33768.00	34568.00	36258.00	26498.00	31748.00	32008.00	32068.00
01.12.12	34508.00	35308.00	37488.00	37808.00	38408.00	40588.00	29098.00	35288.00	35468.00	35448.00
16.12.12	34818.00	35618.00	37958.00	37918.00	38718.00	41058.00	29308.00	35568.00	35748.00	35718.00
INCREASE	310.00	310.00	470.00	310.00	310.00	470.00	210.00	280.00	280.00	270.00

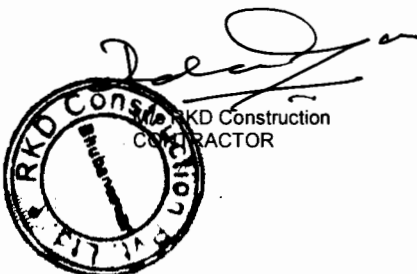
Excise Duty @ 16% will be charged on the Basic Price.

- Education Cess @3% w.e.f.:01.03.2007
- CST@2% WEF:01.06.2008
- Excise Duty @14% w.e.f.01.03.2008
- VG Grade Bitumen introduced w.e.f. 15.07.2009
- C.S.T @ 2% (Against C-Form) will be extra and will be charged after E.D. or full rate C.S.T. prevailing on the date of supply will be charged.
- Orissa Entry Tax @ 2% will be directly borne by the customer
- The price is Ex-Haldia and the customer has to arrange his own transport.
- W.E.F 01.09.2010 VAT ON BITUMEN EMULSION & CRMB SHALL BE AT THE RATE OF 12.5 %
- W.E.F 01.04.2011 VAT ON BITUMEN EMULSION & CRMB SHALL BE AT THE RATE OF 13.5 %
- W.E.F 01.04.2012 VAT CHANGED TO 5%.

Thanking you,

Yours faithfully,
 For Indian Oil Corpn Ltd.

Pamarty Padma
 Dy. Manager (Consumer Sales),
 Bhubaneswar CSA
 Mobile No.: 9437028793



[Signature]
 Chief Engineer
 World Bank Projects, Odisha
 EMPLOYER

Chief Engineer,
 World Bank Project
 O/o the E.I.C.(Civil), Odisha
 Bhubaneswar.

CASH / CREDIT BILL

TIN - 21961900525 No. 278

SHAKTI FILLING STATION
 NH. 5, Near Girisola (Ganjam)
 R. Subani (0660) 2244432
 Cell: 992702147
 Dealers of *Green*
 Bharat Petroleum Corporation Ltd.
R.K.D. CPL

PARTICULARS	RATE	AMOUNT
Petrol <i>HSD</i> Ltrs.		
H.S.D. Oil <i>1000</i> Ltrs.	<i>43/82</i>	<i>43820/-</i>
Lub. Ltrs.		
<i>Supor 5/7/12</i>		<i>C</i>

Date... *5/7/12* E. & O.E. *Kneel*
Signature

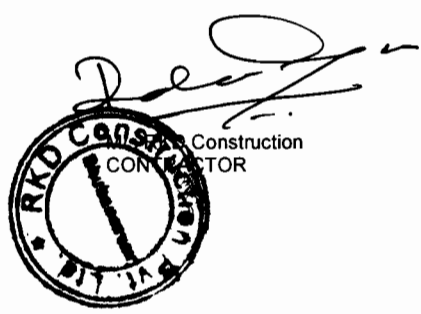
CASH / CREDIT BILL

TIN : 21961900525 No 172

SHAKTI FILLING STATION
 NH. 5, Near Girisola (Ganjam)
 R. Subani (0680) 2244432
 Cell: 9437022341
 Dealers of *Green*
 Bharat Petroleum Corporation Ltd.
Sri R.K.D. CPL LTD.

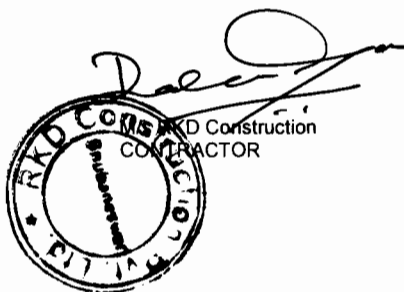
PARTICULARS	RATE	AMOUNT
Petrol <i>HSD</i>		
H.S.D. Oil <i>1000</i> Ltrs.	<i>43/82</i>	<i>43820/-</i>
Lub. Ltrs.		
<i>Satish 11/7/12</i>		<i>C</i>

Date... *11/07/12* E.O.E. *Kneel*
Signature



S.D.
 Chief Engineer
 World Bank Projects, Odisha
 EMPLOYER
 Chief Engineer
 World Bank Project
 O/o the E.I.C. (Civil), Odisha
 Bhubaneswar.

SECTION 3: CONDITIONS OF CONTRACT



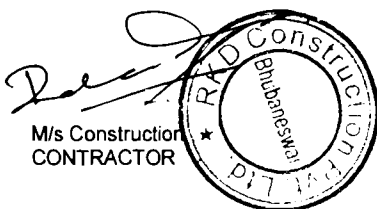

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Conditions of Contract

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Conditions of Contract

A. General

1. Definitions

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

The **Adjudicator** is the person appointed jointly by the Employer and the Contractor to resolve disputes in the first instance, as provided for in Clauses 24 and 25. The name of the Adjudicator is defined in the Contract Data.

Bill of Quantities means the priced and completed **Bill of Quantities** forming part of the Bid.

Compensation Events are those defined in Clause 44 hereunder.

The **Completion Date** is the date of completion of the Works as certified by the Engineer in accordance with Sub Clause 55.1.

The **Contract** is the contract between the Employer and the Contractor to execute, complete and maintain the Works. It consists of the documents listed in Clause 2.3 below.

The **Contract Data** defines the documents and other information which comprise the Contract.

The **Contractor** is a person or corporate body whose Bid to carry out the Works has been accepted by the Employer.

The **Contractor's Bid** is the completed Bidding document submitted by the Contractor to the Employer.

The **Contract Price** is the price stated in the Letter of Acceptance and thereafter as adjusted in accordance with the provisions of the Contract.



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


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

The **Defects Liability Period** is the period named in the Contract Data and calculated from the Completion Date.

The **Employer** is the party who will employ the Contractor to carry out the Works.

The **Engineer** is the person named in the Contract Data (or any other competent person appointed and notified to the contractor to act in replacement of the Engineer) who is responsible for supervising the execution of the works and administering the Contract.


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Equipment is the Contractor's machinery and vehicles brought temporarily to the Site to construct the Works.

The **Initial Contract Price** is the Contract Price listed in the Employer's Letter of Acceptance.

The **Intended Completion Date** is the date on which it is intended that the Contractor shall complete the Works. The Intended Completion Date is specified in the Contract Data. The Intended Completion Date may be revised only by the Engineer by issuing an extension of time.

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

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

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

Site Investigation Reports are those which were included in the Bidding documents and are factual interpretative reports about the surface and sub-surface conditions at the site.

Specification means the Specification of the Works included in the Contract and any modification or addition made or approved by the Engineer.

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

A **Subcontractor** is a person or corporate body who has a Contract with the Contractor to carry out a part of the work in the Contract which includes work on the Site.

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

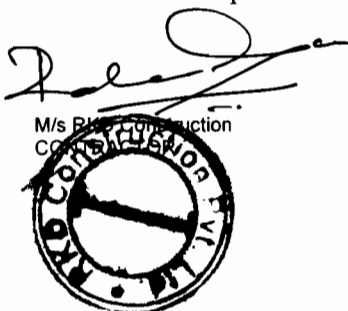
A **Variation** is an instruction given by the Engineer which varies the Works.

The **Works** are what the Contract requires the Contractor to construct, install, and turn over to the Employer, as defined in the Contract Data.

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 Engineer will provide instructions clarifying queries about the Conditions of Contract.

2.2 If sectional completion is specified in the Contract Data, references in the Conditions of Contract to the Works, the Completion Date, and the Intended Completion Date apply to any Section of the Works (other than references to the Completion Date and Intended Completion date for the whole of the Works).




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

- (1) Agreement
- (2) Letter of Acceptance, notice to proceed with the works
- (3) Contractor's Bid
- (4) Contract Data
- (5) Conditions of Contract including Special Conditions of Contract
- (6) Specifications
- (7) Drawings
- (8) Bill of Quantities and
- (9) any other document listed in the Contract Data as 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 Decisions

4.1 Except where otherwise specifically stated, the Engineer will decide contractual matters between the Employer and the Contractor in the role representing the Employer.

5. Delegation

5.1 The Engineer may delegate any of his duties and responsibilities to other people except to the Adjudicator after notifying the Contractor and may cancel any delegation after notifying the Contractor.

6. Communications

6.1 Communications between parties which are referred to in the conditions are effective only when in writing. A notice shall be effective only when it is delivered (in terms of Indian Contract Act).


7. Subcontracting

7.1 The Contractor may subcontract with the approval of the Engineer but may not assign the Contract without the approval of the Employer in writing. Subcontracting does not alter the Contractor's obligations.

8. Other Contractors

8.1 The Contractor shall cooperate and share the Site with other contractors, public authorities, utilities, and the Employer between the dates given in the Schedule of Other Contractors. The Contractor shall as referred to in the Contract Data, also provide facilities and services for them as described in the Schedule. The employer may modify the schedule of other contractors and shall notify the contractor of any such modification.

9. Personnel


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9.1 The Contractor shall employ the key personnel named in the Schedule of Key Personnel as referred to in the Contract Data to carry out the functions stated in the Schedule or other personnel approved by the Engineer. The Engineer will approve any proposed replacement of key personnel only if their qualifications, abilities, and relevant experience are substantially equal to or better than those of the personnel listed in the Schedule.

9.2 If the Engineer asks the Contractor to remove a person who is a member of the Contractor's staff or his work force stating the reasons the Contractor 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 Contractor's Risks

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

11. Employer's Risks

11.1 The Employer is responsible for the excepted risks which are (a) 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 Contractor's employees), and contamination from any nuclear fuel or nuclear waste or radioactive toxic explosive, or (b) a cause due solely to the design of the Works, other than the Contractor's design.

12. Contractor'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 are the responsibility of the Contractor.

13. Insurance

13.1 The Contractor shall provide, in the joint names of the Employer and the Contractor, insurance cover from the Start Date to the end of the Defects Liability Period, in the amounts and deductibles stated in the Contract Data for the following events which are due to the Contractor's risks:

- (a) loss of or damage to the Works, Plant and Materials;
- (b) loss of or damage to Equipment;
- (c) loss of or damage of property (except the Works, Plant, Materials and Equipment) in connection with the Contract; and
- (d) personal injury or death.

13.2 Policies and certificates for insurance shall be delivered by the Contractor to the Engineer for the Engineer's approval before the Start Date. All such insurance shall


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provide for compensation to be payable in the types and proportions of currencies required to rectify the loss or damage incurred.

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

13.4 Alterations to the terms of an insurance shall not be made without the approval of the Engineer.

13.5 Both parties shall comply with any conditions of the insurance policies.

14. Site Investigation Reports

14.1 The Contractor, in preparing the Bid, shall rely on any site Investigation Reports referred to in the Contract Data, supplemented by any information available to the Bidder.

15. Queries about the Contract Data

15.1 The Engineer will clarify queries on the Contract Data.

16. Contractor to Construct the Works

16.1 The Contractor shall construct and install the Works in accordance with the Specification and Drawings, and as per instructions of Engineer.

17. The Works to Be Completed by the Intended Completion Date

17.1 The Contractor may commence execution of the Works on the Start Date and shall carry out the Works in accordance with the program submitted by the Contractor, as updated with the approval of the Engineer, and complete them by the Intended Completion Date.

18. Approval by the Engineer

18.1 The Contractor shall submit Specifications and Drawings showing the proposed Temporary Works to the Engineer, who is to approve them if they comply with the Specifications and Drawings.

18.2 The Contractor shall be responsible for design of Temporary Works.

18.3 The Engineer's approval shall not alter the Contractor's responsibility for design of the Temporary Works.

18.4 The Contractor shall obtain approval of third parties to the design of the Temporary Works where required.

18.5 All Drawings prepared by the Contractor for the execution of the temporary or permanent Works, are subject to prior approval by the Engineer before their use.

19. Safety


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19.1 The Contractor shall be responsible for the safety of all activities on the Site.

20. Discoveries

20.1 Anything of historical or other interest or of significant value unexpectedly discovered on the Site is the property of the Employer. The Contractor is to notify the Engineer of such discoveries and carry out the Engineer's instructions for dealing with them.

21. Possession of the Site

21.1 The Employer shall give possession of all parts of the Site to the Contractor. If possession of a part is not given by the date stated in the Contract Data the Employer is deemed to have delayed the start of the relevant activities and this will be Compensation Event.

22. Access to the Site

22.1 The Contractor shall allow the Engineer and any person authorized by the Engineer 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 for the works.

23. Instructions

23.1 The Contractor shall carry out all instructions of the Engineer which comply with the applicable laws where the Site is located.

23.2 Inspections and Audits by the Bank



The Contractor shall permit the Bank and/or persons appointed by the Bank to inspect the Site and/or the accounts and records of the Contractor and its subcontractors relating to the performance of the Contract, and to have such accounts and records audited by auditors appointed by the Bank if required by the Bank. The Contractor's attention is drawn to Clause 64 [Corrupt or Fraudulent Practices] which provides, inter alia, that acts intended to materially impede the exercise of the Bank's inspection and audit rights provided for under Sub-Clause 23.2 constitute a prohibited practice subject to contract termination (as well as to a determination of ineligibility under the Procurement Guidelines).

24. Disputes

24.1 If the Contractor believes that a decision taken by the Engineer was either outside the authority given to the Engineer by the Contract or that the decision was wrongly taken, the decision shall be referred to the Adjudicator within 14 days of the notification of the Engineer's decision.

25. Procedure for Disputes

25.1 The Adjudicator shall give a decision in writing within 28 days of receipt of a notification of a dispute.


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- 25.2 The Adjudicator shall be paid daily at the rate specified in the Contract Data together with reimbursable expenses of the types specified in the Contract Data and the cost shall be divided equally between the Employer and the Contractor, whatever decision is reached by the Adjudicator. Either party may refer a decision of the Adjudicator to an Arbitrator within 28 days of the Adjudicator's written decision. If neither party refers the dispute to arbitration within the above 28 days, the Adjudicator's decision will be final and binding.
- 25.3 The arbitration shall be conducted in accordance with the arbitration procedure stated in the Special Conditions of Contract.

26. Replacement of Adjudicator

- 26.1 Should the Adjudicator resign or die, or should the Employer and the Contractor agree that the Adjudicator is not fulfilling his functions in accordance with the provisions of the Contract, a new Adjudicator will be jointly appointed by the Employer and the Contractor. In case of disagreement between the Employer and the Contractor, within 30 days, the Adjudicator shall be designated by the Appointing Authority designated in the Contract Data at the request of either party, within 14 days of receipt of such request.

B. Time Control

27. Program

- 27.1 Within the time stated in the Contract Data the Contractor shall submit to the Engineer for approval a Program including Environmental Management Plan showing the general methods, arrangements, order, and timing for all the activities in the Works along with monthly cash flow forecast.
- 27.2 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.
- 27.3 The Contractor shall submit to the Engineer, for approval, an updated Program at intervals no longer than the period stated in the Contract Data. If the Contractor does not submit an updated Program within this period, the Engineer 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.
- 27.4 The Engineer's approval of the Program shall not alter the Contractor's obligations. The Contractor may revise the Program and submit it to the Engineer again at any time. A revised Program is to show the effect of Variations and Compensation Events.

28. Extension of the Intended Completion Date

- 28.1 The Engineer shall extend the Intended Completion Date if a Compensation Event occurs or a Variation is issued which makes it impossible for Completion to be achieved by the Intended Completion Date without the Contractor taking steps to accelerate the remaining work and which would cause the Contractor to incur additional cost.



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28.2 The Engineer shall decide whether and by how much to extend the Intended Completion Date within 21 days of the Contractor asking the Engineer for a decision upon the effect of a Compensation Event or Variation and submitting full supporting information. If the Contractor 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 Intended Completion Date.

29. Deleted

30. Delays Ordered by the Engineer

30.1 The Engineer may instruct the Contractor to delay the start or progress of any activity within the Works.

31. Management Meetings

31.1 Either the Engineer or the Contractor may require the other to attend a management meeting. The business of a management meeting shall be to review the plans for remaining work and to deal with matters raised in accordance with the early warning procedure.

31.2 The Engineer shall record the business of management meetings and is to provide copies of his record to those attending the meeting and to the Employer. The responsibility of the parties for actions to be taken is to be decided by the Engineer either at the management meeting or after the management meeting and stated in writing to all who attended the meeting.

32. Early Warning

32.1 The Contractor is to warn the Engineer 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 works. The Engineer may require the Contractor to provide an estimate of the expected effect of the future event or circumstance on the Contract Price and Completion Date. The estimate is to be provided by the Contractor as soon as reasonably possible.

32.2 The Contractor shall cooperate with the Engineer in making and considering proposals for 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 Engineer.

C. Quality Control

33. Identifying Defects

33.1 The Engineer shall check the Contractor's work and notify the Contractor of any Defects that are found. Such checking shall not affect the Contractor's responsibilities. The Engineer may instruct the Contractor to search for a Defect and to uncover and test any work that the Engineer considers may have a Defect.

33.2 The contractor shall permit the Employer's Technical auditor to check the contractor's work and notify the Engineer and Contractor of any defects that are found. Such a check


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shall not affect the Contractor's or the Engineer's responsibility as defined in the Contract Agreement.

34. Tests

34.1 If the Engineer instructs the Contractor 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 Contractor shall pay for the test and any samples. If there is no Defect the test shall be a Compensation Event.

35. Correction of Defects

35.1 The Engineer shall give notice to the Contractor of any Defects before the end of the Defects Liability Period, which begins at Completion and is defined in the Contract Data. The Defects Liability Period shall be extended for as long as Defects remain to be corrected.

35.2 Every time notice of a Defect is given, the Contractor shall correct the notified Defect within the length of time specified by the Engineer's notice.

36. Uncorrected Defects

36.1 If the Contractor has not corrected a Defect within the time specified in the Engineer's notice, the Engineer will assess the cost of having the Defect corrected, and the Contractor will pay this amount.

Note: Where in certain cases, the technical specifications provide for acceptance of works within specified tolerance limits at reduced rates, Engineer will certify payments to Contractor accordingly.

D. Cost Control

37. Bill of Quantities

37.1 The Bill of Quantities shall contain items for the construction, installation, testing, and commissioning work to be done by the contractor.

37.2 The Bill of Quantities is used to calculate the Contract Price. The Contractor is paid for the quantity of the work done at the rate in the Bill of Quantities for each item.

38. Changes in the Quantities

38.1 If the final quantity of the work done differs from the quantity in the Bill of Quantities for the particular item by more than 25 percent, provided the change exceeds 1% of Initial Contract Price, the Engineer shall adjust the rate to allow for the change.

38.2 The Engineer shall not adjust rates from changes in quantities if thereby the Initial Contract Price is exceeded by more than 15 percent, except with the Prior approval of the Employer.

38.3 If requested by the Engineer, the Contractor shall provide the Engineer with a detailed cost breakdown of any rate in the Bill of Quantities.


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39. Variations

39.1 All Variations shall be included in updated Programs produced by the Contractor.

40. Payments for Variations

40.1 The Contractor shall provide the Engineer with a quotation (with breakdown of unit rates) for carrying out the Variation when requested to do so by the Engineer. The Engineer shall assess the quotation, which shall be given within seven days of the request or within any longer period stated by the Engineer and before the Variation is ordered.

40.2 If the work in the Variation corresponds with an item description in the Bill of Quantities and if, in the opinion of the Engineer, the quantity of work above the limit stated in Sub Clause 38.1 or the timing of its execution do not cause the cost per unit of quantity to change, the rate in the bill of Quantities shall be used to calculate the value of the Variation. If the cost per unit of quantity changes, or if the nature or timing of the work in the Variation does not correspond with items in the Bill of Quantities, the quotation by the Contractor shall be in form of new rates for the relevant items of work.

40.3 If the Contractor's quotation is unreasonable (or if the contractor fails to provide the Engineer with a quotation within a reasonable time specified by the engineer in accordance with Clause 40.1), the Engineer may order the Variation and make a change to the Contract Price which shall be based on Engineer's own forecast of the effects of the Variation on the Contractor's costs.

40.4 If the Engineer decides that the urgency of varying the work would prevent a quotation being given and considered without delaying the work, no quotation shall be given and the Variation shall be treated as a Compensation Event.

40.5 The Contractor shall not be entitled to additional payment for costs that could have been avoided by giving early warning.

41. Cash flow forecasts

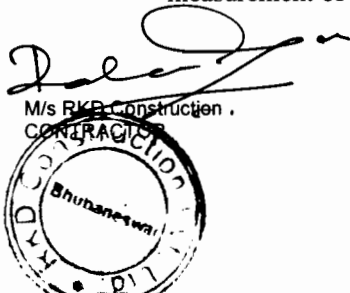
41.1 When the Program is updated, the contractor is to provide the Engineer with an updated cash flow forecast.

42. Payment Certificates

42.1 The Contractor shall submit to the Engineer monthly statements of the estimated value of the work completed less the cumulative amount certified previously alongwith details of measurement of the quantity of works executed in a tabulated form as approved by the Engineer.

42.2 The Engineer shall check the details given in the Contractor's monthly statement and within 14 days certify the amounts to be paid to the Contractor after taking into account any credit or debit for the month in question in respect of materials for the works in the relevant amounts and under conditions set forth in sub-clause 51(3) of the Contract Data (Secured Advance).

42.3 The value of work executed shall be determined by the Engineer after due check measurement of the quantities claimed as executed by the contractor.




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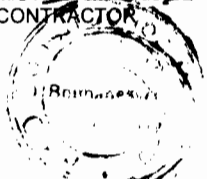
- 42.4** The value of work executed shall comprise the value of the quantities of the items in the Bill of Quantities completed..
- 42.5** The value of work executed shall include the valuation of Variations and Compensation Events.
- 42.6** The Engineer may exclude any item certified in a previous certificate or reduce the proportion of any item previously certified in any certificate in the light of later information.

43. Payments

- 43.1** Payments shall be adjusted for deductions for advance payments, retention, other recoveries in terms of the contract and taxes, at source, as applicable under the law. The Employer shall pay the Contractor the amounts certified by the Engineer within 28 days of the date of each certificate. If the Employer makes a late payment, the Contractor shall be paid interest on the late payment in the next payment. Interest shall be calculated from the date by which the payment should have been made upto the date when the late payment is made at 8% per annum.
- 43.2** If an amount certified is increased in a later certificate or as a result of an award by the Adjudicator or an Arbitrator, the Contractor shall be paid interest upon the delayed payment as set out in this clause. Interest shall be calculated from the date upon which the increased amount would have been certified in the absence of dispute.
- 43.3** Items of the Works for which no rate or price has been entered in will not be paid for by the Employer and shall be deemed covered by other rates and prices in the Contract.

44. Compensation Events

- 44.1** The following are Compensation Events unless they are caused by the Contractor:
- (a) The Employer does not give access to a part of the Site by the Site Possession Date stated in the Contract Data.
 - (b) The Employer modifies the schedule of other contractors in a way which affects the work of the contractor under the contract.
 - (c) The Engineer orders a delay or does not issue drawings, specifications or instructions required for execution of works on time.
 - (d) The Engineer instructs the Contractor to uncover or to carry out additional tests upon work which is then found to have no Defects.
 - (e) The Engineer unreasonably does not approve for a subcontract to be let.
 - (f) Ground conditions are substantially more adverse than could reasonably have been assumed before issuance of Letter of Acceptance from the information issued to Bidders (including the Site Investigation Reports), from information available publicly and from a visual inspection of the Site.


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- (g) The Engineer gives an instruction for dealing with an unforeseen condition, caused by the Employer, or additional work required for safety or other reasons.
- (h) Other contractors, public authorities, utilities or the Employer does not work within the dates and other constraints stated in the Contract, and they cause delay or extra cost to the Contractor.
- (i) The advance payment is delayed.
- (j) The effect on the Contractor of any of the Employer's Risks.
- (k) The Engineer unreasonably delays issuing a Certificate of Completion.
- (l) Other Compensation Events listed in the Contract Data or mentioned in the Contract.

44.2 If a Compensation Event would cause additional cost or would prevent the work being completed before the Intended Completion Date, the Contract Price shall be increased and/or the Intended Completion Date is extended. The Engineer shall decide whether and by how much the Contract Price shall be increased and whether and by how much the Intended Completion Date shall be extended.

44.3 As soon as information demonstrating the effect of each Compensation Event upon the Contractor's forecast cost has been provided by the Contractor, it is to be assessed by the Engineer and the Contract Price shall be adjusted accordingly. If the Contractor's forecast is deemed unreasonable, the Engineer shall adjust the Contract Price based on Engineer's own forecast. The Engineer will assume that the Contractor will react competently and promptly to the event.

44.4 The Contractor shall not be entitled to compensation to the extent that the Employer's interests are adversely affected by the Contractor not having given early warning or not having cooperated with the Engineer.

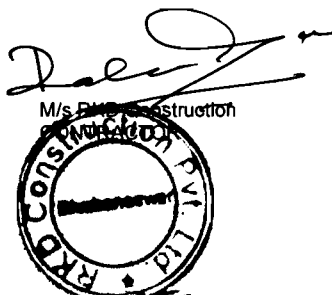
45. Tax

45.1 The rates quoted by the Contractor shall be deemed to be inclusive of the sales and other taxes that the Contractor 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.

46. Currencies

46.1 All payments shall be made in Indian Rupees.

47. Price Adjustment



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47.1 Contract price shall be adjusted for increase or decrease in rates and price of labour, materials, fuels and lubricants in accordance with the following principles and procedures and as per formula given in the contract data:

- (a) The price adjustment shall apply for the work done from the start date given in the contract data upto end of the initial intended completion date or extensions granted by the Engineer and shall not apply to the work carried out beyond the stipulated time for reasons attributable to the contractor.
- (b) The price adjustment shall be determined during each quarter from the formula given in the contract data.
- (c) Following expressions and meanings are assigned to the work done during each quarter:

R = Total value of work done during the quarter. It would include the amount of secured advance for materials paid for (if any) during the quarter, less the amount of the secured advance recovered, during the quarter. It will exclude value for works executed under variations for which price adjustment will be worked separately based on the terms mutually agreed.

47.2 To the extent that full compensation for any rise or fall in costs to the contractor is not covered by the provisions of this or other clauses in the contract, the unit rates and prices included in the contract shall be deemed to include amounts to cover the contingency of such other rise or fall in costs.

48. Retention

48.1 The Employer shall retain from each payment due to the Contractor the proportion stated in the Contract Data until Completion of the whole of the Works.

48.2 On Completion of the whole of the Works half the total amount retained is repaid to the Contractor and half when the Defects Liability Period has passed and the Engineer has certified that all Defects notified by the Engineer to the Contractor before the end of this period have been corrected.

48.3 On completion of the whole works, the contractor may substitute retention money (*balance half*) with an "on demand" Bank guarantee.

49. Liquidated Damages

49.1 The Contractor shall pay liquidated damages to the Employer at the rate per day stated in the Contract Data for each day that the Completion Date is later than the Intended Completion Date (for the whole of the works or the milestone as stated in the contract data). The total amount of liquidated damages shall not exceed the amount defined in the Contract Data. The Employer may deduct liquidated damages from payments due to the Contractor. Payment of liquidated damages does not affect the Contractor's liabilities.

49.2 If the Intended Completion Date is extended after liquidated damages have been paid, the Engineer shall correct any overpayment of liquidated damages by the Contractor by adjusting the next payment certificate. The Contractor shall be paid interest on the over


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payment calculated from the date of payment to the date of repayment at the rates specified in Sub Clause 43.1.

50. Deleted

51. Advance Payment

51.1 The Employer shall make advance payment to the Contractor of the amounts stated in the Contract Data by the date stated in the Contract Data, against provision by the Contractor of an Unconditional Bank Guarantee in a form and by a bank acceptable to the Employer in amounts and currencies equal to the advance payment. The guarantee shall remain effective until the advance payment has been repaid, but the amount of the guarantee shall be progressively reduced by the amounts repaid by the Contractor. Interest will not be charged on the advance payment.

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

51.3 The advance payment shall be repaid by deducting proportionate amounts from payments otherwise due to the Contractor, following the schedule of completed percentages of the Works on a payment basis. No account shall be taken of the advance (mobilization and equipment only) payment or its repayment in assessing valuations of work done, Variations, price adjustments, Compensation Events, or Liquidated Damages.

51.4 Secured Advance:

The Engineer shall make advance payment in respect of materials intended for but not yet incorporated in the Works in accordance with conditions stipulated in the Contract Data.

52. Securities

52.1 The Performance Security shall be provided to the Employer no later than the date specified in the Letter of Acceptance and shall be issued in an amount and form and by a bank or surety acceptable to the Employer, and denominated in Indian Rupees. The Performance Security shall be valid until a date 28 days from the date of expiry of Defects Liability Period and the additional security for unbalanced bids shall be valid until a date 28 days from the date of issue of the certificate of completion.

53. Deleted

54. Cost of Repairs

54.1 Loss or damage to the Works or Materials to be incorporated in the Works between the Start Date and the end of the Defects Correction periods shall be remedied by the Contractor at the Contractor's cost if the loss or damage arises from the Contractor's acts or omissions.


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E. Finishing the Contract

55. Completion

55.1 The Contractor shall request the Engineer to issue a Certificate of Completion of the Works and the Engineer will do so upon deciding that the Work is completed.

56. Taking Over

56.1 The Employer shall take over the Site and the Works within seven days of the Engineer issuing a certificate of Completion.

57. Final Account

57.1 The Contractor shall supply to the Engineer a detailed account of the total amount that the Contractor considers payable under the Contract before the end of the Defects Liability Period. The Engineer shall issue a Defect Liability Certificate and certify any final payment that is due to the Contractor within 56 days of receiving the Contractor's account if it is correct and complete. If it is not, the Engineer shall issue within 56 days a schedule that states the scope of the corrections or additions that are necessary. If the Final Account is still unsatisfactory after it has been resubmitted, the Engineer shall decide on the amount payable to the Contractor and issue a payment certificate, within 56 days of receiving the Contractor's revised account.

58. Operating and Maintenance Manuals

58.1 If "as built" Drawings and/or operating and maintenance manuals are required, the Contractor shall supply them by the dates stated in the Contract Data.

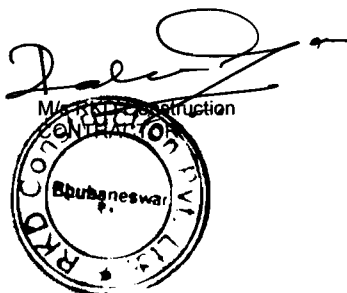
58.2 If the Contractor does not supply the Drawings and/or manuals by the dates stated in the Contract Data, or they do not receive the Engineer's approval, the Engineer shall withhold the amount stated in the Contract Data from payments due to the Contractor.

59. Termination

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

59.2 Fundamental breaches of Contract include, but shall not be limited to the following:

- (a) the Contractor 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 Engineer;
- (b) the Engineer instructs the Contractor to delay the progress of the Works and the instruction is not withdrawn within 28 days;
- (c) the Employer or the Contractor is made bankrupt or goes into liquidation other than for a reconstruction or amalgamation;



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- (d) a payment certified by the Engineer is not paid by the Employer to the Contractor within 56 days of the date of the Engineer's certificate;
- (e) the Engineer gives Notice that failure to correct a particular Defect is a fundamental breach of Contract and the Contractor fails to correct it within a reasonable period of time determined by the Engineer;
- (f) the Contractor does not maintain a security which is required;
- (g) the Contractor has delayed the completion of works by the number of days for which the maximum amount of liquidated damages can be paid as defined in the Contract data; and
- (h) if the Contractor, in the judgment of the Purchaser has engaged in fraud and corruption, as defined in GCC Clause 64, in competing for or in executing the Contract.

59.3 When either party to the Contract gives notice of a breach of contract to the Engineer for a cause other than those listed under Sub Clause 59.2 above, the Engineer shall decide whether the breach is fundamental or not.

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

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


60. Payment upon Termination

60.1 If the Contract is terminated because of a fundamental breach of Contract by the Contractor, the Engineer shall issue a certificate for the value of the work done less advance payments received 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. Additional Liquidated Damages shall not apply. If the total amount due to the Employer exceeds any payment due to the Contractor the difference shall be a debt payable to the Employer.

60.2 If the Contract is terminated at the Employer's convenience or because of a fundamental breach of Contract by the Employer, the Engineer shall issue a certificate for the value of the work done, the reasonable cost of removal of Equipment, repatriation of the Contractor's personnel employed solely on the Works, and the Contractor'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.

61. Property

61.1 All materials on the Site, Plant, Equipment, Temporary Works and Works are deemed to be the property of the Employer, if the Contract is terminated because of a Contractor's default.


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62. Release from Performance

62.1 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 Contractor the Engineer shall certify that the Contract has been frustrated. The Contractor shall make the Site safe and stop work as quickly as possible after receiving this certificate and shall be paid for all work carried out before receiving it and for any work carried out afterwards to which commitment was made.

63. Suspension of World Bank Loan or Credit

63.1 In the event that the World Bank suspends the Loan or Credit to the Employer, from which part of the payments to the Contractor are being made:

- (a) The Employer is obligated to notify the Contractor of such suspension within 7 days of having received the World Bank's suspension notice.
- (b) If the Contractor has not received sums due to it upon the expiration of the 28 days for payment provided for in Sub-Clause 43.1, the Contractor may immediately issue a 14-day termination notice.

64. Corrupt or Fraudulent Practices:

64.1 If the Employer determines that the Contractor has engaged in corrupt, fraudulent, collusive coercive or obstructive practices, in competing for or in executing the Contract, then the Employer may, after giving 14 days notice to the Contractor, terminate the Contractor's employment under the Contract and expel him from the Site, and the provisions of Clause 59 shall apply.

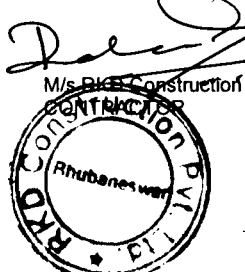
Should any employee of the Contractor be determined to have engaged in corrupt, fraudulent, collusive, coercive, or obstructive practice during the execution of the Works, then that employee shall be removed in accordance with Clause 9 [Personnel].

For the purposes of this Sub-Clause:

- (i) **"corrupt practice"¹ is the offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party;**
- (ii) **"fraudulent practice"² is any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;**

¹ "another party" refers to a public official acting in relation to the procurement process or contract execution]. In this context, "public official" includes World Bank staff and employees of other organizations taking or reviewing procurement decisions.

² a "party" refers to a public official; the terms "benefit" and "obligation" relate to the procurement process or contract execution; and the "act or omission" is intended to influence the procurement process or contract execution.



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- (iii) “collusive practice”³ is an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party;
- (iv) “coercive practice”⁴ is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;
- (v) “obstructive practice” is
 - (aa) deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a Bank investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation, or
 - (bb) acts intended to materially impede the exercise of the Bank’s inspection and audit rights provided for under Sub-Clause 23.2 [Inspections and Audits by the Bank].”

F. Special Conditions of Contract

1. **LABOUR :**

The Contractor 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.

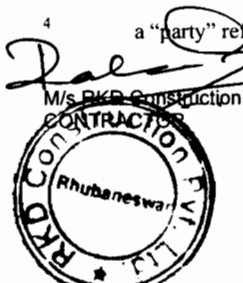
The Contractor shall, if required by the Engineer, deliver to the Engineer a return in detail, in such form and at such intervals as the Engineer may prescribe, showing the staff and the numbers of the several classes of labour from time to time employed by the Contractor on the Site and such other information as the Engineer may require.

2. **COMPLIANCE WITH LABOUR REGULATIONS :**

During continuance of the contract, the Contractor and his sub contractors 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 authority and any other labour law (including rules), regulations, bye laws 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 the local authority. Salient features of some of the major labour laws that are applicable to construction industry are given below. The Contractor 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,

³ “parties” refers to participants in the procurement process (including public officials) attempting to establish bid prices at artificial, non competitive levels.

⁴ a “party” refers to a participant in the procurement process or contract execution.




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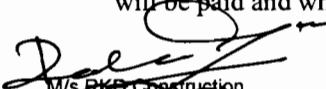
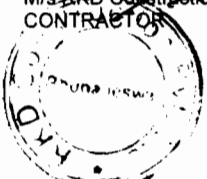
or for non-observance of the provisions stipulated in the notifications/bye laws/Acts/Rules/regulations including amendments, if any, on the part of the Contractor, the Engineer/Employer shall have the right to deduct any money due to the Contractor including his amount of performance security. The Employer/Engineer shall also have right to recover from the Contractor any sum required or estimated to be required for making good the loss or damage suffered by the Employer.

The employees of the Contractor and the Sub-Contractor in no case shall be treated as the employees of the Employer at any point of time.

SALIENT FEATURES OF SOME MAJOR LABOUR LAWS APPLICABLE TO ESTABLISHMENTS ENGAGED IN BUILDING AND OTHER CONSTRUCTION WORK

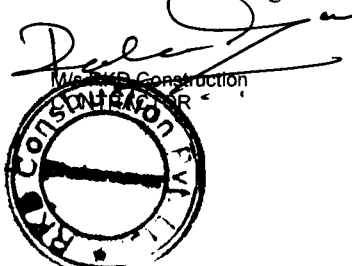
(The law as current on the date of bid opening will apply)

- a) Workmen Compensation Act 1923: The Act provides for compensation in case of injury by accident arising out of and during the course of employment.
- b) Payment of Gratuity Act 1972: Gratuity is payable to an employee under the Act on satisfaction of certain conditions on separation if an employee has completed 5 years service or more or on death the rate of 15 days wages for every completed year of service. The Act is applicable to all establishments employing 10 or more employees.
- c) Employees P.F. and Miscellaneous Provision Act 1952 (since amended): The Act Provides for monthly contributions by the employer plus workers @ 10% or 8.33%. The benefits payable under the Act are :
 - (i) Pension or family pension on retirement or death, as the case may be.
 - (ii) Deposit linked insurance on the death in harness of the worker.
 - (iii) payment of P.F. accumulation on retirement/death etc.
- d) Maternity Benefit Act 1951: The Act provides for leave and some other benefits to women employees in case of confinement or miscarriage etc.
- e) Contract Labour (Regulation & Abolition) Act 1970: The Act provides for certain welfare measures to be provided by the Contractor to contract labour and in case the Contractor fails to provide, the same are required to be provided, by the Principal Employer by Law. The Principal Employer is required to take Certificate of Registration and the Contractor is required to take license from the designated Officer. The Act is applicable to the establishments or Contractor of Principal Employer if they employ 20 or more contract labour.
- f) Minimum Wages Act 1948: The Employer is supposed to pay not less than the Minimum Wages fixed by appropriate Government as per provisions of the Act if the employment is a scheduled employment. Construction of Buildings, Roads, Runways are scheduled employments.
- g) Payment of Wages Act 1936: It lays down as to by what date the wages are to be paid, when it will be paid and what deductions can be made from the wages of the workers.


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- h) Equal Remuneration Act 1979: The Act provides for payment of equal wages for work of equal nature to Male and Female workers and for not making discrimination against Female employees in the matters of transfers, training and promotions etc.
- i) Payment of Bonus Act 1965: The Act is applicable to all establishments employing 20 or more employees. The Act provides for payments of annual bonus subject to a minimum of 8.33% of wages and maximum of 20% of wages to employees drawing Rs.3500/-per month or less. The bonus to be paid to employees getting Rs.2500/- per month or above upto Rs.3500/- per month shall be worked out by taking wages as Rs.2500/-per month only. The Act does not apply to certain establishments. The newly set-up establishments are exempted for five years in certain circumstances. Some of the State Governments have reduced the employment size from 20 to 10 for the purpose of applicability of this Act.
- j) Industrial Disputes Act 1947: The Act lays down the machinery and procedure for resolution of Industrial disputes, in what situations a strike or lock-out becomes illegal and what are the requirements for laying off or retrenching the employees or closing down the establishment.
- k) Industrial Employment (Standing Orders) Act 1946: It is applicable to all establishments employing 100 or more workmen (employment size reduced by some of the States and Central Government to 50). The Act provides for laying down rules governing the conditions of employment by the Employer on matters provided in the Act and get the same certified by the designated Authority.
- l) Trade Unions Act 1926: The Act lays down the procedure for registration of trade unions of workmen and employers. The Trade Unions registered under the Act have been given certain immunities from civil and criminal liabilities.
- m) Child Labour (Prohibition & Regulation) Act 1986: The Act prohibits employment of children below 14 years of age in certain occupations and processes and provides for regulation of employment of children in all other occupations and processes. Employment of Child Labour is prohibited in Building and Construction Industry.
- n) Inter-State Migrant workmen's (Regulation of Employment & Conditions of Service) Act 1979: The Act is applicable to an establishment which employs 5 or more inter-state migrant workmen through an intermediary (who has recruited workmen in one state for employment in the establishment situated in another state). The Inter-State migrant workmen, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as housing, medical aid, travelling expenses from home upto the establishment and back, etc.
- o) The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 and The Building and Other Construction workers Welfare Cess Act of 1996: All the establishments who carry on any building or other construction work and employs 10 or more workers are covered under this Act. All such establishments are required to pay cess at the rate of 1% of the cost of construction as notified by the Labour & Employment Department, Government of Odisha in December, 2008.
- p) Factories Act 1948: The Act lays down the procedure for approval at plans before setting up a factory, health and safety provisions, welfare provisions, working hours, annual earned leave and rendering information regarding accidents or dangerous occurrences to designated



authorities. It is applicable to premises employing 10 persons or more with aid of power or 20 or more persons without the aid of power engaged in manufacturing process.

3. SUB-CONTRACTING (GCC Clause 7)

Please add the following as Clause 7.2:

The contractor shall not be required to obtain any consent from the employer for:

- a) The sub-contracting of any part of the Works for which the Sub-contractor is named in the contract;
- b) The provision of labour; and
- c) The purchase of materials which are in accordance with the standards specified in the Contract.

Beyond this if the contractor proposes sub-contracting any part of the work during execution of works, because of some unforeseen circumstances to enable him to complete the work as per terms of the contract, the Engineer will consider the following before according approval:

- The contractor shall not sub-contract the whole of the Works.
- The contractor shall not sub-contract any part of the Work without prior consent of the Engineer. Any such consent shall not relieve the contractor from any liability or obligations under the contract and he shall be responsible for the acts, defaults and neglects of any sub-contractor, his agents or workmen as fully as if they were the acts, defaults or neglects of the contractor, his agents or workmen.
- The Engineer should satisfy whether (a) the circumstances warrant such sub-contracting; and (b) the sub-contractors so proposed for the Work possess the experience, qualifications and equipment necessary for the job proposed to be entrusted to them in proportion to the quantum of work to be sub-contracted.
- If payments are proposed to be made directly to that sub-contractor, this should be subject to specific authorization by the prime contractor so that this arrangement does not alter the contractor's liability or obligations under the contract.

4. ARBITRATION (GCC Clause 25.3)

The procedure for arbitration will be as follows :

- 25.3 (a) In case of Dispute or difference arising between the Employer and a domestic contractor relating to any matter arising out of or connected with this agreement, such disputes or difference shall be settled in accordance with the Arbitration and Conciliation Act, 1996. The arbitral tribunal shall consist of 3 arbitrators one each to be appointed by the Employer and the Contractor. The third Arbitrator shall be chosen by the two Arbitrators so appointed by the Parties and shall act as 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 arbitrator appointed subsequently, the Presiding Arbitrator shall be appointed by the * Indian Council of Arbitration/President of the Institution of Engineers (India)/The International Centre for Alternative Dispute Resolution (India).




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(Note: 1. All bidders are expected to indicate clearly in the bid, if they proposed sub-contracting elements of the works amounting to more than 20 percent of the Bid Price. For each such proposal the qualification and the experience of the identified sub-contractor in the relevant field should be furnished alongwith the bid to enable the employer to satisfy himself about their qualifications before agreeing for such sub-contracting and include it in the contract. In view of the above, normally no additional sub-contracting should arise during execution of the contract.

2. However, [a] sub contracting for certain specialized elements of the work is not unusual and acceptable for carrying out the works more effectively; but vertical splitting of the works for subcontracting is not acceptable. [b] In any case, proposal for sub-contracting in addition to what was specified in bid and stated in contract agreement will not be acceptable if the value of such additional sub-contracting exceeds 25% of value of work which was to be executed by Contractor without sub-contracting.

3. Assignment of the contract may be acceptable only under exceptional circumstances such as insolvencies/liquidation or merger of companies etc.

- (b) In the case of dispute with a Foreign contractor the dispute shall be settled in accordance with provisions of UNCITRAL Arbitration Rules. The Arbitral Tribunal shall consist of three Arbitrators one each to be appointed by the Employer and the Contractor. The third Arbitrator shall be chosen by the two Arbitrators so appointed by the Parties, and shall act a 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 arbitrator appointed subsequently, the Presiding arbitrator shall be appointed by the * Indian Council of Arbitration/President of the Institution of Engineers (India)/The International Centre for Alternative Dispute Resolution (India).

- (c) If one of the parties fails to appoint its arbitrator in pursuance of sub-clause (a) and (b) above within 30 days after receipt of the notice of the appointment of its arbitrator by the other party, then the * Indian Council of Arbitration/President of the Institution of Engineers (India)/The International Centre for Alternative Dispute Resolution (India), both in cases of the Foreign Contractor as well as Indian Contractor, shall appoint the arbitrator. A certified copy of the order of the *Indian Council of Arbitration /President of the Institution of Engineers (India)/The International Centre for Alternative Disputes Resolution (India), making such an appointment shall be furnished to each of the parties.
- (d) Arbitration proceedings shall be held at Bhubaneswar, Odisha, India, 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. However, the expenses incurred by each party in connection with the preparation, presentation, etc. of its proceedings as also the fees and expenses paid to the arbitrator appointed by such party or on its behalf shall be borne by each party itself.
- (f) Where the value of the contract is Rs.50 millions and below, the disputes or differences arising shall be referred to the Sole Arbitrator. The Sole Arbitrator should be appointed by agreement between the parties; failing such agreement, by the appointing authority,



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namely the *Indian Council of Arbitration/President of the Institution of Engineers (India)/The International Centre for Alternative Disputes Resolution (India).

- (g) Performance under the contract shall continue during the arbitration proceedings and payments due to the contractor by the owners shall not be withheld, unless they are the subject matter of the arbitration proceedings.

5. PROTECTION OF ENVIRONMENT:

Add the following as GCC Clause 16.2:

The contractor shall 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.

During continuance of the contract, the contractor and his sub-contractors shall abide at all times by all existing enactments on environmental protection and rules made thereunder, 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 authority.

Salient features of some of the major laws that are applicable are given below :

The Water (Prevention and Control of Pollution) Act, 1974, This provides for the prevention and control of water pollution and the maintaining and restoring of wholesomeness of water. 'Pollution' means such contamination of water or such alteration of the physical, chemical or biological properties of water or such discharge of any sewage or trade effluent or of any other liquid, gaseous or solid substance into water (whether directly or indirectly) as may, or is likely to, create a nuisance or render such water harmful or injurious to public health or safety, or to domestic, commercial, industrial, agricultural or other legitimate uses, or to the life and health of animals or plants or of aquatic organisms.

The Air (Prevention and Control of Pollution) Act, 1981, This provides for prevention, control and abatement of air pollution. 'Air Pollution' means the presence in the atmosphere of any 'air pollutant', which means any solid, liquid or gaseous substance (including noise) present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment.

The Environment (Protection) Act, 1986, This provides for the protection and improvement of environment and for matters connected therewith, and the prevention of hazards to human beings, other living creatures, plants and property. 'Environment' includes water, air and land and the inter-relationship which exists among and between water, air and land, and human beings, other living creatures, plants, micro-organism and property.

The Public Liability Insurance Act, 1991, This provides for public liability insurance for the purpose of providing immediate relief to the persons affected by accident occurring while handling hazardous substances and for matters connected herewith or incidental thereto. Hazardous substance means any substance or preparation which is defined as hazardous

Choose one alternative. Insert Chairman of the executive Committee of the Indian Roads Congress (for highway project) or any other appropriate institutions (for other types of works).



substance under the Environment (Protection) Act 1986, and exceeding such quantity as may be specified by notification by the Central Government.

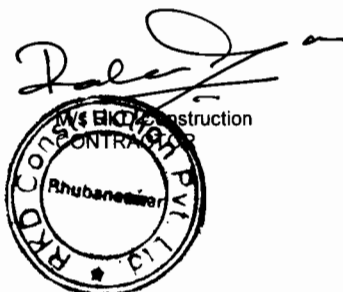
[Employers should note that the Loan Agreement between IBRD and the borrowing country may establish specific measures to be taken during construction of the Works for the protection of the environment. Sub-clause 16.2 should be modified/expanded to take into account such specific measures or other measures considered appropriate by the Employer]

6. LIQUIDATED DAMAGES:

Sub-clause 49.1:

Please substitute the last sentence with the following:

“Time is the essence of the contract and payment or deduction of liquidated damages shall not relieve the contractor from his obligation to complete the work as per agreed construction program and milestones or from any other of the contractor’s obligations and liabilities under the contract.”




Chief Engineer
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EMPLOYER

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Bhubaneswar

SECTION 4: CONTRACT DATA




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EMPLOYER
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World Bank Project
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Bhubaneswar.

Contract Data

(Items marked "N/A" do not apply in this Contract.)

Sl. No.	Conditions	Data	Clause Reference
1	The following documents are also part of the Contract:		
	a. The Schedule of Operating and Maintenance Manuals	N/A	[58]
	b. The Schedule of Other Contractors		[8]
	c. The Schedule of Key Personnel		[9]
	d. The Methodology and Program of Construction & Environmental Management Plan		[27]
	e. The Schedule of Key and Critical equipment to be deployed on the work as per agreed program of construction		[27]
	f. Site Investigation reports		[14]
2	The Borrower is	Government of Odisha through Government of India	[1.1]
3	The World Bank means	<i>International Bank for Reconstruction and Development (IBRD)</i> and loan refers to an <i>IBRD Loan</i> .	[1.1]
4	The Employer is	Name: <i>Chief Engineer, World Bank Projects, Odisha</i> on behalf of <i>Works Department, Government of Odisha</i> Address: Office of the E.I.C.(Civil), Odisha, Nirman Soudha, Keshari Nagar, Bhubaneswar-751001 Odisha. Email: pmuosrp@gmail.com ,	[1.1]

Ms. RKD Construction



Chief Engineer
World Bank Projects, Odisha
EMPLOYER

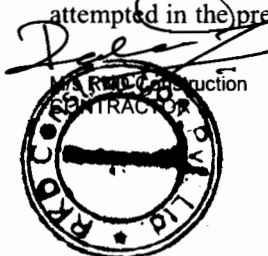
Chief Engineer
World Bank Project
O/o the E.I.C.(Civil), Odisha
Bhubaneswar.

		website : www.osrp.gov.in , Tel:: 0674-2396783 Fax : 0674-2390080	
	Name of authorized Representative:	N/A	[1.1]
5	The Engineer is	Name: M/s MSV International, Inc, USA in J.V with UPHAM International Corporation. Address: D-7, South City-I, Gurgaon, Haryana-122002 Facsimile: +91-124-4002605	[1.1]
	Name of Authorized Representative:	N/A	[1.1]
6	The Adjudicator appointed jointly by the Employer and Contractor is:	Name : Sri Bhaskar Chandra Hota, E.I.C-cum-Secretary (Retd.), Works Department, Odisha Address : Plot No. N – 3 / 223, IRC Village, Bhubaneswar	[1.1]
7	The name and identification number of the Contract is [insert name and number as indicated in the Invitation for Bids (or Prequalification, if any)]	OSRP-Bal-P03 PMU-WB-61/2012-18418 Dt-04.06.2012	[1.1]

8. The Works consist of :

This road located in the south-eastern part of Odisha and takes off from NH 217 at 18th km near Berhampur. Berhampur, a principal commercial town of south Odisha, is located at about 8km from Bay of Bengal. The terrain is predominantly plain and villages are closely located between 0/0 to 27/0. The stretch of road is located in Ganjam district. This area experiences rainfall of average 1500mm per annum and bulk of the rainfall occurs during June to October, which is the monsoon period in Odisha. Highest temperature in the area during , March to May is 45 degree Celsius and the temperature dips to the lowest of 10 degree Celsius during winter season. This project stretch passes through Berhampur, Digapahandi, villages/semi urban area. Principal river in the area is river Malabhanja, which crosses the project road at 29/200 Km near Digapahandi.

The work was awarded in September, 2008 Vide Agreement No-2/2008 of C.E, World Bank Projects, Odisha. The work was terminated in September 15, 2011. About 8 Kms of work has been attempted in the previous contract. There are incomplete stretches of work and un-attempted stretches



of work. CD works & Bridges are also in incomplete shape. Bidders are encouraged to visit the site to have first hand feel of the site conditions before bidding.

The proposed construction package to be taken up is as follows:

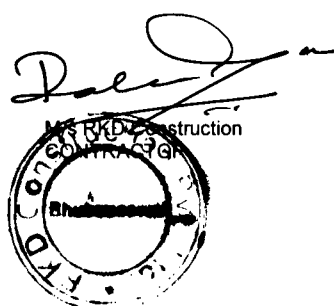
Sl.	Package No.	Name of the Road	Approximate Length of Construction in Km	Period of Construction
1	OSRP-BAL- P03	Balance Work of Widening and Strengthening of Existing Lanes to Two Lane Road from Berhampur - Taptapani Road(Km 0/0 to Km 41/0 of SH-17)	41 kms	24 Months

The civil works shall broadly comprise of the following, as required, mostly along existing alignments.

- a. Improvement of road geometry;
- b. Raising & Widening of embankments considering drainage and road geometry
- c. Sub base, base and bituminous pavement with limited concrete pavements in built up areas and toll plazas;
- d. Widening and paving of carriageway and shoulders;
- e. Improvement of side drainage & improvement to or replacement and widening of culverts;
- f. Repair and rehabilitation of bridges;
- g. Construction of new Culverts and Bridges;
- h. Traffic safety features;
- i. Road signs and road markings;
- j. Environmental protection and management measures during construction stage;
- k. Traffic diversion and management during the construction;
- l. Routine Maintenance of Project Corridors during the construction period;
- m. Construction and maintenance of Diversion roads

Sl. No.	Conditions	Data	Clause Reference
9	The Start Date	Shall be the date of issue of notice to proceed with the work.	[1.1]
10	The Intended Completion Date for the whole of the Works is	24 Months from the Start date with the following milestones given below:	[17, 28]

Milestone dates:



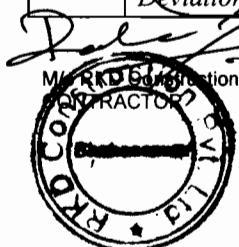
Chief Engineer
World Bank Projects, Odisha
EMPLOYER


Chief Engineer
World Bank Project
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Bhubaneswar.

	Error! Not a valid link.	<u>Period from the date of issue of notice to proceed with the work</u>
Milestone 1	Section-I contains the following stretches : *5/100 Km to 9/800 Km and *36/000 Km to 41/000 Km (Total-9.7 Km)	10 (Ten) Months from Commencement of Works
Milestone 2	Section-II contains the following stretches : *9/800 Km to 20/000 Km (Total-10.2 Km)	14 (fourteen) Months from Commencement of Works
Milestone 3	Section-III contains the following stretches: 26/000 Km to 36/000 Km (Total-10.0 Km)	18 (Eighteen) Months from Commencement of Works
Milestone 4	Section-IV contains the following stretches: 0/000 Km to 5/100 Km and *20/000 Km to 26/000 Km (Total-11.1 Km)	24 (Twenty-four) Months from Commencement of Works

Note:- * Some parts of this stretch has been taken up in previous contract.

Sl. No.	Conditions	Data	Clause Reference
11	The following documents also form part of the Contract:		[2.3]
	The Contractor shall submit a revised Program including Environmental Management Plan for the Works (in such form and detail as the engineer shall reasonably prescribe) <i>[This program should be in adequate detail and generally conform to the program submitted alongwith bid in response to ITB Clause 4.3 (k). Deviations if any from that should be</i>	within 14 days of delivery of the Letter of Acceptance.	[27]




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	<i>clearly explained and should be satisfactory to the Engineer]</i>		
12	The Site Possession Dates shall be:	<p><u>Section-I</u></p> <p>The 9.7 Kms stretch will be handed over for execution prior to issuance of advance payments under Clause 51 as detailed below. The section includes incomplete stretches and CD works done by the previous contractor & other encumbrance free stretches.</p> <p>5/100 Km to 9/800 Km</p> <p>36/000 Km to 41/000 Km (Total-9.7 Km)</p> <p><u>Section-II</u></p> <p>The 10.2 Kms stretch will be handed over for execution as detailed below <u>within three months of date of commencement</u>. The section includes incomplete stretches and CD works taken up by the previous contractor & other encumbrance free stretches.</p> <p>9/800 Km to 20/000 Km (Total-10.2 Km)</p> <p><u>Section-III</u></p> <p>The 10.0 Kms stretch will be handed over for execution <u>within five months of date of commencement</u> as detailed below.</p> <p>26/000 km to 36/000 km (Total-10.0 Km)</p> <p><u>Section-IV</u></p> <p>The 11.1 Kms stretch will be handed over for execution <u>within seven months of date of commencement</u> as detailed below. The section includes incomplete stretches and CD works taken up by the previous contractor & other encumbrance free stretches.</p>	[21]

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		0/000 Km to 5/100 Km 20/000 Km to 26/000 Km (Total-11.1 Km) <u>Within one week of handing over of the each stretch, contractor needs to examine and provide acceptance of receiving encumbrance free land or inform the employer otherwise with any deficiencies. Minor changes to the section may be done by the Employer.</u>																			
13	The Site is located at	In the Ganjam District of Odisha and is defined in Drawings provided in Section- 6	[1]																		
14	The Defect Liability Period is	365 days from the date of certification of completion of works. (where sectional completion certificate is issued, this will apply from those dates for those sections).	[35]																		
15	Insurance requirements are as under:	<table border="1"> <thead> <tr> <th></th> <th><u>Minimum Cover for Insurance</u></th> <th><u>Maximum deductible for Insurance</u></th> </tr> </thead> <tbody> <tr> <td>(i) Works and Plant and Materials</td> <td>Equal to Contract Amount</td> <td>0.2% of Contract Amount</td> </tr> <tr> <td>(ii) Loss or damage to Equipment</td> <td>10% of Contract Amuont</td> <td>0.1% of Contract Amount</td> </tr> <tr> <td>(iii) Other Property</td> <td>5% of Contract Amuont</td> <td>0.1% of Contract Amount</td> </tr> <tr> <td>(iv) Personal injury or death insurance for Contractor's Employees</td> <td>Rs. 8 Lakh</td> <td>0.1% of Contract Amount</td> </tr> <tr> <td>(v) Personal injury or death insurance for other people</td> <td colspan="2">In accordance with the statutory requirements applicable to India</td> </tr> </tbody> </table>		<u>Minimum Cover for Insurance</u>	<u>Maximum deductible for Insurance</u>	(i) Works and Plant and Materials	Equal to Contract Amount	0.2% of Contract Amount	(ii) Loss or damage to Equipment	10% of Contract Amuont	0.1% of Contract Amount	(iii) Other Property	5% of Contract Amuont	0.1% of Contract Amount	(iv) Personal injury or death insurance for Contractor's Employees	Rs. 8 Lakh	0.1% of Contract Amount	(v) Personal injury or death insurance for other people	In accordance with the statutory requirements applicable to India		[13]
	<u>Minimum Cover for Insurance</u>	<u>Maximum deductible for Insurance</u>																			
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(iv) Personal injury or death insurance for Contractor's Employees	Rs. 8 Lakh	0.1% of Contract Amount																			
(v) Personal injury or death insurance for other people	In accordance with the statutory requirements applicable to India																				
16	The following events shall also be Compensation Events:	N/A	[44]																		
17	The period between Program updates shall be	90 days	[27]																		



18	The amount to be withheld for late submission of an updated Program shall be	Rs. 5,00, 000/-	[27]
19	The language of the Contract documents is	English	[3]
20	The law which applies to the Contract is	the laws of Union of India	[3]
21	The currency of the Contract is	Indian Rupees	[46]
22	Fees and types of reimbursable expenses to be paid to the Adjudicator	(a) Monthly Retainer Fees:- Rs. 10,000/- (b) Daily Fee of Rs. 4,000/- shall be paid for each day of site visit . (c) Rs.2,000/- per day shall be paid during travel time upto a maximum of two days in each direction for journey Travelling expenses as per actual.	[25]
23	Appointing Authority for the Adjudicator	Chief Engineer, World Bank Projects, Odisha	[26]
24	The formula(e) for adjustment of prices are:	As indicated below	[47]

The formula(e) for adjustment of prices are:
[47]

R = Value of work as defined in Clause 47.1 of Conditions of Contract.

Adjustment for labour component

(i) Price adjustment for increase or decrease in the cost due to labour shall be paid in accordance with the following formula:

$$V_L = 0.85 \times P_1/100 \times R \times (L_i - L_o)/L_o$$

V_L = increase or decrease in the cost of work during the quarter under consideration due to changes in rates for local labour.

L_o = The Minimum Wage for the quarter preceding the date of opening of Bids as notified by the Labour and Employment Department, Government of Odisha

L_i = The Revised Minimum Wage for the quarter under consideration as notified by the Labour and Employment Department, Government of Odisha

P_1 = Percentage of labour component of the work.

Adjustment for cement component

[Signature]
M/s. RKD Construction
CONTRACTOR,
Bhubaneswar

[Signature]
Chief Engineer
World Bank Projects, Odisha
EMPLOYER
Chief Engineer
World Bank Project
O/o the E.J.C.(Civil), Odisha
Bhubaneswar.

- (ii) Price adjustment for increase or decrease in the cost of cement procured by the contractor shall be paid in accordance with the following formula.

$$V_c = 0.85 \times P_c/100 \times R \times (C_i - C_o)/C_o$$

V_c = Increase or decrease in the cost of work during the quarter under consideration due to changes in the rates for cement

C_o = The all India average wholesale price index for cement for the quarter preceding the date of opening of Bids as published by the Office of the Economic Advisor, Ministry of Finance, Government of India

C_i = The all India average wholesale price index for cement for the quarter under consideration as published by the Office of the Economic Advisor, Ministry of Finance, Government of India

P_c = Percentage of cement component of the work

Adjustment for steel component

- (iii) Price adjustment for increase or decrease in the cost of steel procured by the Contractor shall be paid in accordance with the following formula:

$$V_s = 0.85 \times P_s/100 \times R \times (S_i - S_o)/S_o$$

V_s = Increase or decrease in the cost of work during the quarter under consideration due to changes in the rates for steel

S_o = The all India average wholesale price index for steel (Bars and Rods) for the quarter preceding the date of opening of Bids as published by the Office of the Economic Advisor, Ministry of Finance, Government of India

S_i = The all India average wholesale price index for steel (Bars and Rods) for the quarter under consideration as published by Office of the Economic Advisor, Ministry of Finance, Government of India

P_s = Percentage of steel component of the work

Note: For the application of this clause, index of Bars and Rods has been chosen to represent steel group.

Adjustment of Bitumen component

- (iv) Price adjustment for increase or decrease in the cost of bitumen shall be paid in accordance with the following formula:

$$V_b = 0.85 \times P_b/100 \times R \times (B_i - B_o)/B_o$$

V_b = Increase or decrease in the cost of work during the quarter under consideration due to changes in the rate for bitumen.


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B_o = The official ex-depot retail price of bulk bitumen VG 30 Grade at the IOC depot at Haldia on the day 30 days prior to date of opening of Bids.

B_i = The average ex-depot retail price of bulk bitumen VG 30 Grade at the IOC depot at Haldia for the quarter under consideration.

P_b = Percentage of bitumen component of the work.

Adjustment of POL (fuel and lubricant) component

- (v) Price adjustment for increase or decrease in cost POL (fuel and lubricant) shall be paid in accordance with the following formula:

$$V_f = 0.85 \times P_f / 100 \times R \times (F_i - F_o) / F_o$$

V_f = Increase or decrease in the cost of work during the quarter under consideration due to changes in rates for fuel and lubricants.

F_o = The average official retail price of High Speed Diesel (HSD) at the existing consumer pumps of IOC at , Berhampur on the day thirty days prior to the date of opening of Bids.

F_i = The average official retail price of HSD at the existing consumer pumps of IOC at Berhampur for the quarter under consideration.

P_f = Percentage of fuel and lubricants component of the work.

Note: For the application of this clause, the price of High Speed Diesel oil has been chosen to represent fuel and lubricants group.

Adjustment for Plant and Machinery Spares component

- (vi) Price adjustment for increase or decrease in the cost of plant and machinery spares procured by the Contractor shall be paid in accordance with the following formula:

$$V_p = 0.85 \times P_p / 100 \times R \times (P_i - P_o) / P_o$$

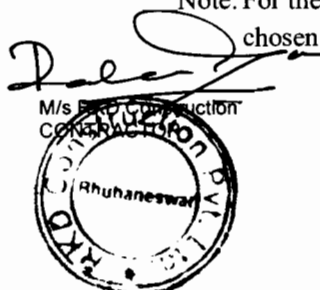
V_p = Increase or decrease in the cost of work during the quarter under consideration due to changes in the rates for plant and machinery spares

P_o = The all India average wholesale price index for heavy machinery and parts for the quarter preceding the date of opening of Bids as published by the Ministry of Industrial Development, Government of India, New Delhi

P_i = The all India average wholesale price index for heavy machinery and parts for the quarter under consideration as published by Ministry of Industrial Development, New Delhi

P_p = Percentage of plant and machinery spares component of the work

Note: For the application of this clause, index of Heavy Machinery and Parts has been chosen to represent the Plant and Machinery Spares group.




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Chief Engineer
World Bank Project
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Adjustment of Local materials

(vii) Price adjustment for increase or decrease in cost of local materials other than cement, steel, bitumen and POL procured by the contractor shall be paid in accordance with the following formula:

$$V_m = 0.85 \times P_m / 100 \times R \times (M_i - M_o) / M_o$$

V_m = Increase or decrease in the cost of work during the quarter under consideration due to changes in rates for local materials other than cement, steel, bitumen and POL.

M_o = The all India average wholesale price index (all commodities) for the quarter preceding the date of opening of Bids, the Office of the Economic Advisor, Ministry of Finance, Government of India

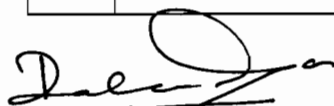

M_i = The all India average wholesale price index (all commodities) for the quarter under consideration as published by the Office of the Economic Advisor, Ministry of Finance, Government of India

P_m = Percentage of local material component (other than cement, steel, bitumen and POL) of the work.

The following percentages will govern the price adjustment for the entire contract:

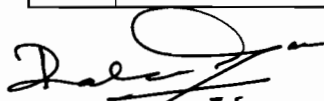

1.	Labour - P_l	15 %
2.	Cement - P_c	10 %
3.	Steel - P_s	10 %
4.	Bitumen - P_b	30 %
5.	POL - P_f	15 %
6.	Plant & Machinery Spares - P_p	10 %
7.	Other materials - P_m	10 %
	Total	100%

Sl. No.	Conditions	Data	Clause Reference
25	The proportion of payments retained (retention money) shall be	10% from each bill subject to a maximum of 5% of contract price	[48]
26	The liquidated damages for the whole of the works are:	For milestone 1 @ Rs. <u>90,000/-</u> per day For milestone 2 @ Rs. <u>1,00,000/-</u> per day For milestone 3 @ Rs. <u>1,25,000/-</u> per day	[49]


M/s R.K. Construction
CONTRACTOR



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		For milestone 4 @ Rs. <u>1,40,000/-</u> per day	
27	The maximum amount of liquidated damages for the whole of the works is	10% percent of contract price.	[49]
28	The amounts of the advance payment are:		[51]
	a. Mobilization	5 % of the Accepted Contract Amount payable in the currencies and proportions in which the Accepted Contract Amount is payable, in one installment after due acceptance of encumbrance free land of Section-I by the contractor and on submission of un-conditional Bank Guarantee.	
	b. Equipment	90% for new and 50% of depreciated value for old equipment after equipment is brought to site as per agreed construction program (provided the Engineer is satisfied that the equipment is required for performance of the contract) and on submission of unconditional Bank Guarantee for amount of advance. Total amount will be subject to a maximum of 10% of the Contract price. This advance is not applicable for equipment already owned or hired/ leased by the contractor.	
	c. Secured advance for non-perishable materials brought to site <i>(The advance payment will be paid to the Contractor no later than 15 days after fulfillment of the above conditions).</i>	On the following materials, subject to maximum of 2% of the accepted contract amount, at any point of time, as required for utilization in the works on submission of un-conditional Bank Guarantee. 1. Reinforced Steel 2. Processed Aggregates 3. Bitumen/ Modified bitumen complying with the following conditions. a) The materials are in-accordance with the	


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CONTRACTOR



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		<p>specification for Works;</p> <p>b) Such materials have been delivered to site, and are properly stored and protected against damage or deterioration to the satisfaction of the Engineer. The contractor shall store the bulk material in measurable stacks.;</p> <p>c) The Contractor's records of the requirements, orders, receipt and use of materials are kept in a form approved by the Engineer and such records shall be available for inspection by the Engineer;</p> <p>d) The contractor has submitted with his monthly statement the estimated value of the materials on site together with such documents as may be required by the Engineer for the purpose of valuation of the materials and providing evidence of ownership and payment thereof;</p> <p>e) Ownership of such materials shall be deemed to vest in the Employer for which the Contractor has submitted an Indemnity Bond in an acceptable format; and</p> <p>f) The quantity of materials are not excessive and shall be used within a reasonable time as determined by the Engineer.</p>	
29	Repayment of advance payment for mobilization:	The advance shall be repaid with percentage deductions from the interim payments certified by the Engineer under the Contract. Deductions shall commence in the next Interim Payment Certificate following that in which the total of all such payments to the Contractor has reached not less than 20% of the Contract Price or 6 months from the date of payment of advance, whichever	[51]

D. K. S. S.
 M/s. R.K.D. Construction
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 EMPLOYER

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 O/o the E.I.C.(Civil), Odisha
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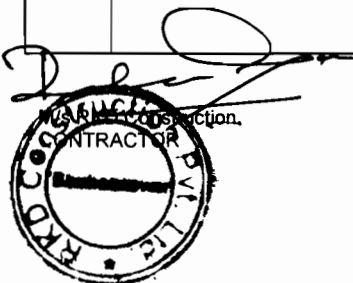
		period concludes earlier, and shall be made at the rate of 10 percent of the amounts of all Interim Payment Certificates until such time as the advance has been repaid, always provided that the advance shall be completely repaid prior to 70% of the completion of the work.	
30	Repayment of secured advance:	The advance shall be repaid from each succeeding monthly payments to the extent materials [for which advance was previously paid pursuant to Clause 51.4 of CC. and 51(3) of Contract Data on prepage] have been incorporated into the Works.	[51]
31	The Securities shall be for the following minimum amounts equivalent as a percentage of the Contract Price:		[52]
	a. Performance Security	5 per cent of contract price plus additional security for unbalanced bids if any to be intimated in the Letter of Acceptance	[in terms of ITB Clause 29.5].
	b. The standard form of Performance Security	An unconditional Bank Guarantee of the types as presented in Section 8 of the Bidding Documents acceptable to the Employer	
32	The date by which operating and maintenance manuals are required	N/A	[58]
33	The manner and date by which "as-built" drawings shall be submitted	a. In the same scale in which the working drawings have been issued. b. Both in hard and soft form within 28 days of issue of certificate of completion of whole or section of the work, as the case may be.	[58]
34	The amount to be withheld for failing to supply "as built" drawings by the date	Rs. 25 lakh	[58]


 M/s PKD Construction
 CONTRACTOR

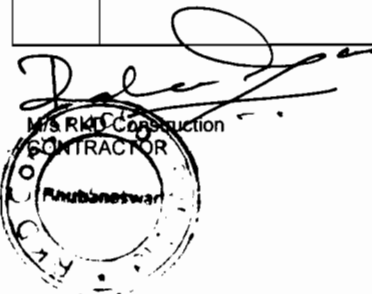


 Chief Engineer
 World Bank Projects, Odisha
 EMPLOYER
 Chief Engineer
 World Bank Project
 O/o the E.I.C.(Civil), Odisha
 Bhubaneswar

	specified		
35	The following events shall also be fundamental breach of contract:	<p>1. The Contractor has contravened Sub-clause 7 of CC read with SCC and Clause 9.0 of CC.</p> <p>2. The contractor does not adhere to the agreed construction program and agreed environmental management plan (Clause 27 of CC) and also fails to take satisfactory remedial action as per agreements reached in the management meetings (Clause 31) for a period of 30 days.</p> <p>The contractor fails to carry out of the instructions of Engineer within a reasonable time determined by the Engineer in accordance with CC Clause 16.1 and 23.1.</p>	[59.2]
36	The percentage to apply to the value of the work not completed representing the Employer's additional cost for completing the Works shall be	20 %	[60]
37	Penalty for non performance of following items		
37(a)	Failure to Maintain the Road during construction	<p>The contractor's obligations for maintenance of the road stretches shall be limited to the portions/ stretches/ structures handed over to him by the Employer. Other stretches not handed over to him shall be maintained by the Employer till handing over.</p> <p>In case of failure to execute the same, the following amount shall be deducted from the payment certificates of the contractor.</p> <p>1. Road Surface : In case of failure to maintain the road surface pot hole free, a penalty shall be levied at the rate Rs.1500/- per km per day.</p> <p>2. Shoulders : In case of failure to maintain the shoulders , a penalty shall be levied at the rate Rs.500/- per km per day.</p>	



37(b)	Failure to take up Road Safety measures during construction	<p>The Contractor has to follow all traffic safety measures as defined in the Technical Specifications. In case of failure to execute the same, the work shall be taken up by the department through other agency, and the following amount shall be deducted from the payment certificates of the contractor.</p> <p>1. Diversion:- (a) Penalty @ Rs.5000/- per day per location shall be imposed from the date of occurrence till installation of the safety items.</p> <p>(a) One time deduction for non-performance @ Rs. 1,20,000/- per location towards installation of safety measures</p> <p>(b) Penalty @ Rs.1500/- per day per location towards maintenance of safety measures from the date of installation till removal</p> <p>2. Part Road Barricading:-</p> <p>(a) Penalty @ Rs.5000/- per day per location shall be imposed from the date of occurrence till installation of the safety items.</p> <p>(b) One time deduction for non-performance @ 75,000/- per location of 250 mtr. long road stretch or less towards installation of safety measures</p> <p>(c) Penalty @ Rs.1500/- per day per location towards maintenance of safety measures from the date of installation till removal</p>	[18], [19]
37(c)	Failure to adhere to Environmental Mitigation Measures during construction	<p>The Contractor has to follow all Environmental Mitigation Measures as defined in the Technical Specifications . A penalty shall be levied at the rate indicated below for non-conformity of the following items.</p> <p>1. Not filling up of the post of Environment and Safety Officer- Penalty @ Rs. 50,000/- per month</p> <p>2. No proper sanitation & waste disposal arrangements at the labour camp site- Penalty @ Rs. 10,000/- per single violation compounded to Rs. 50,000/- at any single instance</p> <p>3. No dust control measures at site- Penalty @</p>	



		<p>Rs. 5,000/- per location per single violation compounded to Rs. 50,000/- at any single instance</p> <p>4.No pollution and / or noise control of crusher, hot mix plant, batch mix plant- Penalty @ Rs. 10,000/- per single violation compounded to Rs. 50,000/- at any single instance</p> <p>5.Improper disposal of debris/ residues- Penalty @ Rs. 10,000/- per single violation compounded to Rs. 50,000/- at any single instance</p> <p>6.Spillage of oil at camp site not arrested- Penalty @ Rs. 10,000/- per single violation compounded to Rs. 50,000/- at any single instance</p> <p>7.Persons not using Personal Protective Equipments (PPE)- Penalty @ Rs. 200/- per single violation per person</p> <p>8.Burrow area/ quarry management not done- Penalty @ Rs. 10,000/- per location per instance</p>	
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 Chief Engineer
 World Bank Projects, Odisha
 EMPLOYER

Chief Engineer
 World Bank Project
 O/o the E.I.C.(Civil), Odisha
 Bhubaneswar

GOVERNMENT OF ORISSA

WORKS DEPARTMENT ORISSA STATE ROAD PROJECT

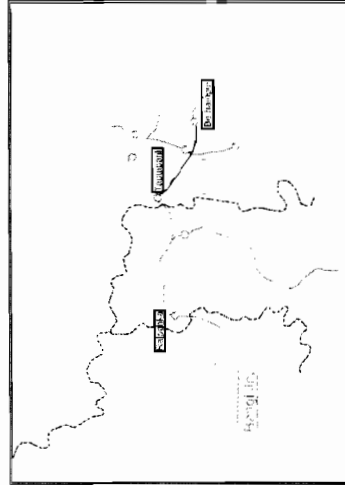
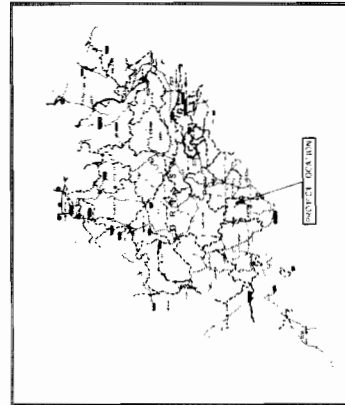
BALANCE WORKS FOR BERHAMPUR TO TAPTAPANI

(SH - 17) FROM KM 0 / 000 TO 41 / 000

FINAL PLAN & PROFILE
AS ON MARCH 20, 2012.

LEGEND

EXISTING CARRIAGE WAY	
PRO. CARRIAGE WAY EDGES	
PROPOSED CENTER LINE	
EXISTING CENTER LINE	
PRO. SHOULDER EDGES	
ELECTRIC POLE	
TRANSFORMER	
TELEPHONE POLE	
TELEPHONE LINE	
H.T. TOWER	
H.T. LINE	
PIPE LINE	
HOUSE/BUILDING/STRUCTURE	
EXISTING ROW BOUNDARY	
PROPOSED ROW BOUNDARY	
BRIDGE/CULVERT	
POND	
RIVER/MALLA/DRAIN	
WELL, HAND PUMP, TAP	
PROPOSED EMBANKMENT	
PIPE CULVERT	
BOX/SLAB CULVERT	
TREE	
NAME BOARD	



Devi
04/01/13.

M/s RKD Construction Pvt. Ltd.
CONTRACT



Devi
4/1/13
Chief Engineer
World Bank Projects, Odisha
EMPLOYER


Chief Engineer
World Bank Project
O/o the E.I.C.(Civil), Odisha
Bhubaneswar.

INDEX OF HIGHWAY DRAWINGS

SL.No.	Description	Drawing No.
33	Plan & Profile From Km.18 /000 to km.19 /000	OSRP/CEG/SH-17/P&P/19
34	Plan & Profile From Km.19 /000 to km.20 /000	OSRP/CEG/SH-17/P&P/20
35	Plan & Profile From Km.20 /000 to km.21 /000	OSRP/CEG/SH-17/P&P/21
36	Plan & Profile From Km.21 /000 to km.22 /000	OSRP/CEG/SH-17/P&P/22
37	Plan & Profile From Km.22 /000 to km.23 /000	OSRP/CEG/SH-17/P&P/23
38	Plan & Profile From Km.23 /000 to km.24 /000	OSRP/CEG/SH-17/P&P/24
39	Plan & Profile From Km.24 /000 to km.25 /000	OSRP/CEG/SH-17/P&P/25
40	Plan & Profile From Km.25 /000 to km.26 /000	OSRP/CEG/SH-17/P&P/26
41	Plan & Profile From Km.26 /000 to km.26 /500	OSRP/CEG/SH-17/P&P/27
42	Plan & Profile From Km.26 /500 to km.27 /500	OSRP/CEG/SH-17/P&P/28
43	Plan & Profile From Km.27 /500 to km.28 /500	OSRP/CEG/SH-17/P&P/29
44	Plan & Profile From Km.28 /500 to km.29 /500	OSRP/CEG/SH-17/P&P/30
45	Plan & Profile From Km.29 /500 to km.30 /500	OSRP/CEG/SH-17/P&P/31
46	Plan & Profile From Km.30 /500 to km.31 /500	OSRP/CEG/SH-17/P&P/32
47	Plan & Profile From Km.31 /500 to km.32 /500	OSRP/CEG/SH-17/P&P/33
48	Plan & Profile From Km.32 /500 to km.33 /500	OSRP/CEG/SH-17/P&P/34
49	Plan & Profile From Km.33 /500 to km.34 /500	OSRP/CEG/SH-17/P&P/35
50	Plan & Profile From Km.34 /500 to km.35 /500	OSRP/CEG/SH-17/P&P/36
51	Plan & Profile From Km.35 /500 to km.36 /500	OSRP/CEG/SH-17/P&P/37
52	Plan & Profile From Km.36 /500 to km.37 /500	OSRP/CEG/SH-17/P&P/38
53	Plan & Profile From Km.37 /500 to km.38 /500	OSRP/CEG/SH-17/P&P/39
54	Plan & Profile From Km.38 /500 to km.39 /500	OSRP/CEG/SH-17/P&P/40
55	Plan & Profile From Km.39 /500 to km.40 /500	OSRP/CEG/SH-17/P&P/41
56	Plan & Profile From Km.40 /500 to km.41 /500	OSRP/CEG/SH-17/P&P/42
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57	Plan for Major Junction at 0/000OSRP/CEG/SH-17MJ/0+000	
58	Plan for Major Junction at 24/59017MJ/24+590	
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59	Schedule of Road sign	OSRP/CEG/SH-17/SCH/1
60	Schedule of Road sign	OSRP/CEG/SH-17/SCH/2
61	Schedule of Road sign	OSRP/CEG/SH-17/SCH/3
62	Schedule of crash barrier and delineator	OSRP/CEG/SH-17/SCH/4
63	Schedule of Bus Bays, Extra Widening	OSRP/CEG/SH-17/SCH/5
64	Schedule of Pavement composition	OSRP/CEG/SH-17/SCH/7

SL.No.	Description	Drawing No.
	Cover Sheet	
	Index Sheet (Highway)	
	Index Sheet (Standard Drawings)	
	Index Sheet (Env. Drawings)	
	Index Sheet (Bridge & Culvert Drawings)	
	Index Sheet (Bridges)	
	List of Culverts (Sheet1of2)	
	List of Culverts (Sheet2of2)	
8	Horizontal curve Details(Sheet1of2)	
9	Horizontal curve Details(Sheet2of2)	
10	vertical Curve Details(Sheet1of3)	
11	vertical Curve Details(Sheet2of3)	
12	vertical Curve Details(Sheet3of3)	
13	Attempted lengths of highway works1of2)	
14	Schedule of Balance CD Work (Sheet2of2)	
15	Plan & Profile From Km.0 /000 to km.1 /000	OSRP/CEG/SH-17/P&P/1
16	Plan & Profile From Km.1 /000 to km.2 /000	OSRP/CEG/SH-17/P&P/2
17	Plan & Profile From Km.2 /000 to km.3 /000	OSRP/CEG/SH-17/P&P/3
18	Plan & Profile From Km.3 /000 to km.4 /000	OSRP/CEG/SH-17/P&P/4
19	Plan & Profile From Km.4 /000 to km.5 /000	OSRP/CEG/SH-17/P&P/5
20	Plan & Profile From Km.5 /000 to km.6 /000	OSRP/CEG/SH-17/P&P/6
21	Plan & Profile From Km.6 /000 to km.7 /000	OSRP/CEG/SH-17/P&P/7
22	Plan & Profile From Km.7 /000 to km.8 /000	OSRP/CEG/SH-17/P&P/8
23	Plan & Profile From Km.8 /000 to km.9 /000	OSRP/CEG/SH-17/P&P/9
24	Plan & Profile From Km.9 /000 to km.10 /000	OSRP/CEG/SH-17/P&P/10
25	Plan & Profile From Km.10 /000 to km.11 /000	OSRP/CEG/SH-17/P&P/11
26	Plan & Profile From Km.11 /000 to km.12 /000	OSRP/CEG/SH-17/P&P/12
27	Plan & Profile From Km.12 /000 to km.13 /000	OSRP/CEG/SH-17/P&P/13
28	Plan & Profile From Km.13 /000 to km.14 /000	OSRP/CEG/SH-17/P&P/14
29	Plan & Profile From Km.14 /000 to km.15 /000	OSRP/CEG/SH-17/P&P/15
30	Plan & Profile From Km.15 /000 to km.16 /000	OSRP/CEG/SH-17/P&P/16
31	Plan & Profile From Km.16 /000 to km.17 /000	OSRP/CEG/SH-17/P&P/17
32	Plan & Profile From Km.17 /000 to km.18 /000	OSRP/CEG/SH-17/P&P/18

Annexure - II

INDEX OF STANDARD DRAWINGS(HIGH WAYS)			
DRG NO.	OSRP/CEG/INDEX/02	REV RO PREPARED BY: CEG Iid	REV RI PREPARED BY: EE/PMU
SH.NO.	DATE	REV	R1
SCALE	NTS		
ORISSA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE			
 Project Engineer Odisha EMPLOYER			
APPROVED CE, World Bank Projects.			

INDEX OF STANDARD DRAWINGS

SL.NO.	Description	Drawing No.
	Typical X-section	
65	Typical Cross Section	OSRP/CEG/TCS/01&02
66	Typical Cross Section	OSRP/CEG/TCS/03 & 04
67	Typical Cross Section	OSRP/CEG/TCS/05&06
68	Typical Cross Section	OSRP/CEG/TCS/07&08
69	Typical Cross Section	OSRP/CEG/TCS/09,18 & 20
70	Typical Slope Protection Work	OSRP/CEG/PW
71	Standard Drawings Retaining wall	OSRP/CEG/RW
72	Standard Drawings Details of Drain and Kerb	OSRP/CEG/DR
73	Details of application of Super Elevation	OSRP/CEG/SE
	Junction/Intersection Details	
74	Typical 4-Legged Intersection with Single Lane BT Road	OSRP/CEG/JN/01
75	Typical T-Junction with Single Lane BT Road	OSRP/CEG/JN/02
76	Typical Y-Junction with Single Lane BT/earth Road	OSRP/CEG/JN/03
77	Standard Drawings Typical - Cross Drain Single Lane BT Road/Earth Road	OSRP/CEG/CDJN
	Road Signs, Markings and Misc. Roadway Furnitures	
78	Standard Drawings Details of Road Hump and Rumble Strips	OSRP/CEG/RH &RS
79	Standard Drawings Details of Footpath Barriers	OSRP/CEG/FB
80	Standard Drawings Metal Beam Crash Barrier Details	OSRP/CEG/CB
81	Standard Drawings Typical KM Stone & 5th Km Stone	OSRP/CEG/KM/01
82	Standard Drawings Typical Details of 200m Stone & Guard Post	OSRP/CEG/KM &GP
83	Standard Drawings Details of Road Delineators	OSRP/CEG/RD
84	Standard Drawings Details of RPMs Markers	OSRP/CEG/RPM
85	Standard Drawings Typical Road Marking Details (Sheet 1 of 2)	OSRP/CEG/RM/01
86	Standard Drawings Typical Road Marking Details (Sheet 2 of 2)	OSRP/CEG/RM/02
87	Standard Drawings Typical Road Signs (Sheet 1 of 4)	OSRP/CEG/RS/01
88	Standard Drawings Typical Road Signs (Sheet 2 of 4)	OSRP/CEG/RS/02
89	Standard Drawings Typical Road Signs (Sheet 3 of 4)	OSRP/CEG/RS/03
90	Standard Drawings Typical Road Signs (Sheet 4 of 4)	OSRP/CEG/RS/04
91	Standard Drawings Typical Bus Bay Type-I	OSRP/CEG/BB/01
92	Standard Drawings Typical Bus Bay Section Drawing	OSRP/CEG/BB/02

[Signature]
M/s RKD Construction
COMPTROLLER
Bhubaneswar

INDEX OF STANDARD DRAWINGS			
DRG NO.	OSRP/CEG/INDEX/02	DATE	
SH.NO.		REV	R1
SCALE		NTS	
PROJECT:-	ORISSA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE	RIV/RO PREPARED BY: CEG/Id.	RIV/RI PREPARED BY: EL/P/MU
		APPROVED	CE, World Bank Projects.

[Signature]
Chief Engineer
World Bank Projects, Odisha
EMPLOYER
Chief Engineer
World Bank Project
Page 4 of 135
O/o the E.P.C.(Civil), Odisha
Bhubaneswar.

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M/s RKD Construction
CONTRACTOR



INDEX OF TOLL PLAZA & ENVIRONMENT DRAWINGS

SL.NO.	Description	Drawing No.
	Typical X-section	
	Toll Plaza Details	
93	Standard Drawings Toll Plaza Layout	OSRP/CEG/TP/01
94	Standard Drawings Toll Plaza Main Office	OSRP/CEG/TP/02
95	Standard Drawings Toll Booth	OSRP/CEG/TP/03
96	Standard Drawings Barrier Gate for Toll Plaza	OSRP/CEG/TP/04
97	Standard Drawings Electrical Layout Toll Plaza and Main Office	OSRP/CEG/TP/05
98	Standard Drawings Electrical Layout Toll Plaza	OSRP/CEG/TP/06
99	Standard Drawings Plumbing Layout - Toll Plaza	OSRP/CEG/TP/07
	ENVIRONMENTAL DRAWING	
100	Typical Animal Pass - Single Box Culvert (2.0 X2.0) (Earth Cushion)	OSRP/CEG/TP/07
101	Typical Animal Pass - Single Box Culvert (2.0 X2.0)	ER/BC/BS/WC/XXVI-B1
102	PCC Toe Wall for Water Bodies	OSRP/CEG/ENV-02
103	RCC Boundary Wall Temples and Status	OSRP/CEG/ENV/04-A
104	Noises & Dust Barrier	OSRP/CEG/ENV/04- B
105	Approaches of Educational & Medical Institutions	OSRP/CEG/ENV-05
106	Gate for Educational & Medical Institutions	OSRP/CEG/ENV/05A
107	Typical Bathing Ghat	OSRP/CEG/ENV/09
108	Typical Spillway Ghat	OSRP/CEG/ENV-09
	MISCELLANEOUS	
109	Typical Arrangement of Utility Duct	OSRP/CEG/ENV-01

PROJECT:- Odisha STATE ROADS PROJECT UNDER WORLD BANK ASSISTANCE		INDEX OF STANDARD DRAWINGS (TOLL PLAZA & ENVIRONMENT)			
		DRG NO. SH.NO. SCALE	OSRP/CEG/INDEX/02 DATE	REV	R1
		NTS		REV RD PREPARED BY CEG Ltd.	REV R1 PREPARED BY EE/PMU
				APPROVED	C. World Bank Projects.

[Handwritten Signature]
Chief Engineer
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EMPLOYER

Page No. 135
Chief Engineer,
World Bank Project
O/o the E.I.C. (Civil), Odisha
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INDEX OF BRIDGE & CULVERT DRAWINGS

SL.No.	DRAWING TITLE	DRAWING No
110	GENERAL NOTES (FOR RCC SLAB BRIDGES)	OSRP/CEG/SH-17/BR/NOTES/01
	BRIDGE AT KM. 11+270	
111	GENERAL ARRANGEMENT DRAWING	OSRP/CEG/SH-17/BR/11+270/01
112	DIMENSION & REINFORCEMENT DETAILS OF STRUCTURE	OSRP/CEG/SH-17/BR/11+270/02
113	INDEX PLAN	OSRP/CEG/SH-17/BR/11+270/03
	REHABILITATION BRIDGES	
	BRIDGE AT KM. 1+915	
114	GENERAL ARRANGEMENT DRAWING	OSRP/CEG/SH-17/BR/1+915/01
115	WIDENING & REHABILITATION BRIDGE DETAILS	OSRP/CEG/SH-17/BR/1+915/02
116	DETAILS FOR WIDENING METHODOLOGY OF MINOR BRIDGES	OSRP/CEG/SH-17/BR/1+915/3
	BRIDGE AT KM. 4+400	
117	WIDENING & REHABILITATION BRIDGE DETAILS	OSRP/CEG/SH-17/BR/4+400/01
	BRIDGE AT KM. 11+660	
118	WIDENING & REHABILITATION BRIDGE DETAILS	OSRP/CEG/SH-17/BR/11+660/01
	BRIDGE AT KM. 15+185	
119	WIDENING & REHABILITATION BRIDGE DETAILS	OSRP/CEG/SH-17/BR/15+185/01
	BRIDGE AT KM. 15+680	
120	WIDENING & REHABILITATION BRIDGE DETAILS	OSRP/CEG/SH-17/BR/15+680/01
	BRIDGE AT KM. 17+900	
121	WIDENING & REHABILITATION BRIDGE DETAILS	OSRP/CEG/SH-17/BR/17+900/01
	BRIDGE AT KM. 21+850	
122	WIDENING & REHABILITATION BRIDGE DETAILS	OSRP/CEG/SH-17/BR/21+850/01
	MISC DRAWING	
123	DETAILS OF CRASH BARRIER EXPANSION	OSRP/CEG/BR/MISC-02
124	JOINT, APPROACH SLAB & DRAINAGE SPOUT	OSRP/CEG/BR/JT-01
125	JACKETING DETAIL OF ABUTMENT & PIER	OSRP/CEG/RW/MISC-02
126	DIMENSION & REINFORCEMENT DETAILS OF RETAINING WALL	OSRP/CEG/SH-17/BR/WIDENING METHODOLOGY
127	DETAILS FOR WIDENING METHODOLOGY OF MINOR BRIDGES	OSRP/CEG/SH-17/BR/WIDENING METHODOLOGY
	CULVERTS DRAWINGS	
127	FOR R.C.C SINGLE PIPE CULVERTS (1X1.0M DIA)	OSRP/CEG/SH-17/PIPE CUL-01
128	FOR R.C.C SINGLE PIPE CULVERTS (2X1.0M DIA)	OSRP/CEG/SH-17/PIPE CUL-02
129	FOR R.C.C SINGLE PIPE CULVERTS (10X1.0M DIA)	OSRP/CEG/SH-17/29+560/01
130	GENERAL ARRANGEMENT DRAWING(SINGLE CELL BOX)	OSRP/CEG/SH-17/BOX CUL-01
131	REINFORCEMENT DETAIL OF SINGLE CELL BOX	OSRP/CEG/SH-17/BOX CUL-02
132	GENERAL ARRANGEMENT DRAWING(WIDENING OF SLAB CULVERT)	OSRP/CEG/SH-17/SLAB CUL/W-01
133	DIMENSION & REINFORCEMENT DETAIL OF SLAB & ABUTMENT	OSRP/CEG/SH-17/SLAB CUL/W-02

PROJECT:-		INDEX OF STANDARD DRAWINGS(BRIDGES & CULVERTS)				APPROVED
DRG NO.	OSRP/CEG/INDEX/02	REV NO	PREPARED BY:	REV R1	PREPARED BY	CE, World Bank Projects
SH.NO.		DATE	CEG Ltd.	R1	EE/PMU	
SCALE						

[Signature]

M/s RKD Construction
CONTRACTOR

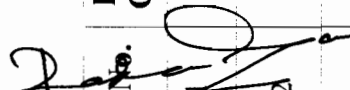
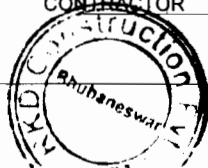


[Signature]
Chief Engineer
World Bank Projects, Odisha
EMPLOYER

World Bank Project
to the E.T.C.(Civil), Odisha
Bhubaneswar.

LIST OF BRIDGES

Location/ Chainage	Design Chainage	Existing Span Arrangement	Proposed Span Arrangement	Carriageway Width (m)	Proposed Width of Bridge (m)	Remarks
1/915	1/925	2 x 6.6	-	7.5	12	Rehabilitation & Widening required.
4/400	4/370	3 x 6.75	-	7.5	12	Rehabilitation & Widening required.
3 11/270	11/286	1 x 6.35	1 x 10.4 Solid Slab (30° skew)	7.5	12	New Construction.
4 11/660	11/735	3 x 6.8	-	7.5	12	Rehabilitation & Widening required.
5 15/185	15/196	2 x 6.8	-	7.5	12	Rehabilitation & Widening required.
6 15/680	15/727	4 X 6.8	-	7.5	12	Rehabilitation & Widening required.
7 17/900	17/851	4 x 6.8	-	7.5	12	Rehabilitation & Widening required.
8 21/850	21/731	3 x 10.8	-	7.5	12	Rehabilitation & Widening required.
9 29/230	29/278	3 x 42.2	-	7.5	12	Good, Nothing to do


 M/s RKS Construction
 CONTRACTOR



 Chief Engineer
 World Bank Projects, Odisha
 EMPLOYEE ID: 1111111111

Chief Engineer
 World Bank Project
 (O/o the E.T.C. (Civil), Odisha
 Bhubaneswar

PROJECT:-

ORISSA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE.



LIST OF BRIDGES

BERHAMPU TO BANGI Jr. (SH-17, KM 0 TO 41)

DRG. NO. / CSRP/SS/SH-17/BR/01	REV. NO.	REV. DATE	REV. BY	REV. DATE	REV. BY
SH. NO. G	SCALE	NTS	APPROVED BY	DATE	APPROVED

Culvert & Utility Ducts Details..PO3

S. No.	Location/Challange	Proposed Challenge	Proposed Span Arrangement New	Type of Proposed Culvert New	Remarks
1	0/190	213	2 x 1.0	Pipe	
2	0/350	369	2 x 1.0	Pipe with Utility	
3	0/830	847	2 x 1.0	Pipe with Utility	
4	0/950	975	2 x 1.0	Pipe	
5	1/150	1146	2 x 1.0	Pipe	
6	1/310	1310	2 x 1.0	Pipe	
7	1/785	1781	2 x 1.0	Pipe	
8	2/140	2137	1/230	RCC Box with Utility	
9	2/285	2337	2 x 1.0	Pipe with Utility	
10	2/515	2515	2 x 1.0	Pipe	
11	2/630	2629	2 x 1.0	Pipe with Utility	
12	2/745	2742	1/330	RCC Box	
13	3/105	3095	1 x 1.0	Pipe	
14	3/265	3259	1 x 1.0	Pipe	
15	3/390	3382	1/230	RCC Box with Utility	
16	3/505	3498	2 x 1.0	Pipe	
17	3/775	3765	2 x 1.0	Pipe	
18	3/895	3890	2 x 1.0	Pipe	
19	4/115	4115	2 x 1.0	Pipe	
20	5/145	5118	1 x 1.5	Slab widening Widening	
21	5/230	5215	1 x 1.0	Pipe	
22	5/535	5521	1/330	RCC Box	
23	5/775	5761	1/330	RCC Box	
24	6/090	6069	2 x 1.0	Pipe	
25	6/555	6497	1 x 1.0	Pipe	
26	6/590	6573	1 x 1.0	Pipe	
27	7/020	7090	1 x 1.0	Pipe	
28	7/240	7217	1 x 1.0	Pipe with Utility	
29	7/540	7520	1 x 1.0	Pipe	
30	7/630	7605	1 x 1.5	Slab Ext with Utility	Widening
31	7/795	7769	2 x 1.0	Pipe	
32	8/030	8008	1 x 1.5	Slab Ext	Widening
33	8/210	8193	2 x 1.0	Pipe with Utility	
34	8/385	8363	1 x 1.0	Pipe	


M/s RKD Construction
CONTRACTOR



Chief Engineer
World Bank Projects, Odisha
EMPLOYEE


S. No.	Location/Challange	Proposed Challenge	Proposed Span Arrangement New	Type of Proposed Culvert New	Remarks
35	8/550	8530	1/330	RCC Box	
36	8/700	8685	2 x 1.0	Pipe	
37	9/175	9152	1/230	RCC Box	
38	9/600	9538	2 x 1.0	Pipe	
39	9/810	9786	1/230	RCC Box with Utility	
40	10/965	10933	1/330	RCC Box	
41	11/120	11120	2 x 1.0	Pipe	
42	11/500	11500	2 x 1.0	Pipe	
43	12/040	12045	2 x 1.0	Pipe	
44	12/380	12407	1 x 1.0	Pipe	
45	12/585	12611	1 x 1.0	Pipe	
46	12/880	12907	2 x 1.0	Pipe	
47	13/110	13132	1 x 1.0	Pipe	
48	13/450	13470	1 x 2	Slab Ext	Widening
49	13/600	13619	1 x 1.0	Pipe with Utility	
50	13/790	13809	2 x 1.0	Pipe	
51	13/895	13916	1 x 1.0	Pipe	
52	14/135	14157	1/220	RCC Box	
53	14/510	14531	1 x 1.0	Pipe	
54	14/855	14877	2 x 1.0	Pipe	
55	15/430	15440	1 x 1.0	Pipe	
56	15/880	15897	1 x 1.0	Pipe	
57	16/050	16068	1 x 1.0	Pipe	
58	16/400	16417	3 x 1.0	Pipe	
59	16/505	16521	1 x 1.0	Pipe	
60	16/750	16770	1 x 1.0	Pipe	
61	16/950	16970	1 x 1.0	Pipe	
62	17/050	17066	1 x 1.0	Pipe	
63	18/020	18028	1/330	RCC Box	
64	18/105	18115	1/220	RCC Box With Utility	
65	18/470	18480	1 x 1.0	Pipe	
66	19/240	19192	2 x 1.0	Pipe	
67	19/430	19382	1 x 1.0	Pipe	
68	19/570	19530	1/220	RCC Box	
69	19/845	19799	1 x 1.0	Pipe	

CULVERT DETAILS
BERHAMPUR TO BANGI Jn. (SH-17, KM 0 TO 41)
DRG NO. (SRP/CEG/SH-17/02/01)
SH. NO. C DATE FEB 2012 REV R1
SCALE NTS
CS. Mark Date Provided

ORISSA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE.

PROJECT:-



M/s RKD Construction
CONTRACTOR




Chief Engineer
World Bank Projects, Odisha
EMPLOYER

Chief Engineer
World Bank Project
O/o the E.I.C.(Civil), Odisha
Rhubaneswar

S. No.	Location/ Chainage	Proposed Change	Proposed Span Arrangement Now	Type of Proposed Culvert Now	Remarks
69	19845	19799	1 x 1.0	Pipe	
70	20755	20361	1 x 1.0	Pipe	
71	20610	20614	1 x 1.0	Pipe with Utility	
72	20920	20935	1 x 1.0	Pipe	
73	21015	21005	1 x 1.0	Pipe	
74	21230	21224	1 x 1.0	Pipe	
75	21420	21411	1 x 1.0	Pipe	
76	21825	21865	2 x 1.0	Pipe with Utility	
77	22210	22189	1 x 1.0	Pipe with Utility	
78	27605	27582	2 x 1.0	Pipe	
79	22790	22761	1 x 1.0	Pipe	
80	22985	22961	1 x 1.0	Pipe	
81	23780	23147	1 x 1.0	Pipe	
82	23700	23555	7/2.0	RCC Box with Utility	
83	23750	23713	1 x 1.0	Pipe	
84	23850	23821	1/2.0	RCC Box	
85	24365	24351	1 x 1.0	Pipe	
86		24600 LHS	1 x 1.0	Pipe with Utility	
87		24600 RHS	1 x 1.0	Pipe with Utility	
88	241020	25106	7/2.0	RCC Box with Utility	
89	25050	25214	1 x 4.2	Slab Ext	Widening
90	25695	25861	1/2.0	RCC Box	
91	25905	26077	1 x 1.0	Pipe	
92	26150	26314	2 x 1.0	Pipe	
93	26430	26612	7/4.0	RCC Box	
94	26850	27026	1/2.1	RCC Box	
95	27600	27743	1 x 1.0	Pipe	
96	27850	28008	1/2.80	RCC Box	
97	28275	28547	1 x 1.0	Pipe	
98	28800	28954	1/3.0	RCC Box	
99		29260	10 x 1.2	Pipe	
100	30060	30241	1/3.0	RCC Box	
101	30460	30637	1 x 1.0	Pipe	
102	30720	30889	1/2.0	RCC Box	
103	31960	32128	1 x 1.0	Pipe with Utility	

S. No.	Location/ Chainage	Proposed Change	Proposed Span Arrangement Now	Type of Proposed Culvert Now	Remarks
104	32300	32465	1 x 1.0	Pipe	
105	33220	33402	2 x 1.0	Pipe with Utility	
106	33310	33476	1/2.0	RCC Box	
107	33806	33976	1 x 1.0	Pipe	
108	33900	34069	1 x 1.0	Pipe with Utility	
109	34250	34463	1 x 1.0	Pipe with Utility	
110	34525	34670	1/3.0	RCC Box	
111	34640	34813	1/2.0	RCC Box	
112	34675	34858	1/3.0	RCC Box	
113	35304	35378	1 x 1.0	Pipe	
114	35330	35333	1 x 1.0	Pipe	
115	35825	36003	1 x 1.0	Pipe	
116	36060	36238	1 x 1.0	Pipe with Utility	
117	36220	36358	1 x 1.0	Pipe	
118	36300	36594	1 x 1.0	Pipe	
119	36575	36758	1 x 1.0	Pipe	
120	36600	36961	1 x 1.0	Pipe with Utility	
121	36990	37164	1 x 1.0	Pipe	
122	37440	37619	1 x 1.0	Pipe	
123	37985	38157	1 x 1.0	Pipe	
124	38350	38483	1 x 1.5	Slab Ext	Widening
125	38600	38746	2 x 1.0	Pipe	
126	38810	39002	2 x 1.0	Pipe	
127	38960	39118	2 x 1.0	Pipe	
128	39340	39517	1/2.0	RCC Box	
129	39455	39671	1 x 1.0	Pipe	
130	39900	40090	1 x 1.0	Pipe	
131	40100	40280	2 x 1.0	Pipe	
132	40240	40437	1 x 1.0	Pipe	
133	40420	40550	2 x 1.0	Pipe	
134	40815	41000	2 x 1.0	Pipe	

PROJECT:-

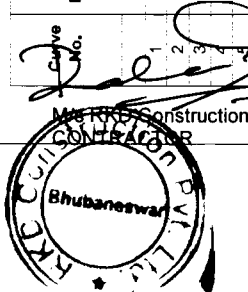
CULVERT DETAILS

BERHAMPUR TO BANGI Jn. (SH-17, KM 0 TO 41)

DRG NO (0897/CEG/SH-17/06/02)	REV. NO.	APPROVED
SH. NO. 0	DATE FEB 2012/REV	RT
SCALE	NTS	

ORISSA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE.

Curve No.	Curve Direction	Chainage	HIP Details		Total Deviation Angle	Design Speed (Km/Hr)	Curve Radius (m.)	Transition Length (m.)	Circular Curve Length (m.)	Shift	Distance from TP to PC	Straight Super-elevation (%)	Transition Start Chainage	Circular Start Chainage	Circular End Chainage	Transition End Chainage
			Easting	Northing	Δ	V	Rc	Ls	Lc	s	k	e	TS	SC	CS	ST
1	Right	261.588	265442.652	213834.653	0.469	100	50000	0	283.30	0.000	0.000	2.500		119.936	403.239	
2	Right	1082.045	264827.868	2138907.881	0.373	100	875	55	266.14	0.144	27.499	5.079	892.94	947.941	1214.078	1269.078
3	Left	1689.87	264534.284	2139442.351	26.473	100	700	65	179.37	0.251	32.498	6.349	1534.69	1599.69	1779.062	1844.062
4	Left	2144.978	264198.842	2139751.224	12.075	100	1000	50	74.46	0.104	24.999	4.444	2057.733	2107.733	2182.189	2322.189
5	Right	2683.238	263764.933	2140069.661	0.143	100	800	60	497.37	0.187	29.999	5.556	2366.223	2426.223	2923.589	2983.589
6	Left	3503.146	263530.637	2140872.823	0.285	100	850	60	368.60	0.176	29.999	5.229	3256.951	3316.951	3683.551	3743.551
7	Left	4458.498	262866.106	2141566.293	0.177	65	200	60	47.75	0.000	29.978	7.000	4374.507	4434.507	4482.261	4542.261
8	Right	4834.488	262505.381	2141671.922	0.234	100	5000	0	208.35	0.000	0.000	2.500		4730.3	4938.646	
9	Left	5725.489	261656.557	2141942.909	9.264	100	25000	0	419.72	0.000	0.000	2.500		5515.624	5935.344	
10	Right	6678.157	260744.646	2142218.579	0.297	100	800	30	115.02	0.047	15.000	5.556	6590.548	6620.548	6735.568	6765.568
11	Right	7216.95	260268.037	2142469.373	7.090	65	200	60	54.98	0.749	29.978	7.000	7129.286	7189.286	7244.265	7304.265
12	Left	8228.758	259753.708	2143340.422	5.254	65	200	60	13.24	0.749	29.978	7.000	8162.134	8222.134	8235.377	8295.377
13	Left	9599.895	258682.591	2144193.995	0.823	80	240	90	1117.35	1.404	44.947	7.000	9450.024	9540.024	9657.372	9747.372
14	Right	10006.278	258277.672	2144144.615	0.575	100	600	80	181.22	0.444	39.994	7.000	9834.974	9914.974	10096.191	10176.191
15	Left	10884.877	257422.725	2144350.604	0.312	80	240	90	17.40	1.404	44.947	7.000	10786.174	10876.174	10893.571	10876.174
16	Right	11221.038	257091.922	2144293.019	0.687	100	6000	0	83.76	0.000	0.000	2.500		11179.159	11262.916	
17	Left	11394.372	256921.384	2144261.998	1.234	100	15000	0	234.85	0.000	0.000	2.500		11276.946	11511.794	
18	Right	11679.808	256641.366	2144206.524	0.926	100	20000	0	59.15	0.000	0.000	2.500		11650.232	11709.383	
19	Left	12003.57	256323.612	2144144.542	0.955	100	2000	0	230.97	0.000	0.000	2.500		11887.956	12118.928	
20	Right	13172.945	255207.604	2143794.619	0.896	100	1000	50	362.93	0.104	24.999	4.444	12939.462	12989.461	13352.391	13402.391
21	Left	13573.689	254804.383	2143829.87	0.978	100	1000	50	136.42	0.104	24.999	4.444	13455.375	13505.375	13641.791	13691.791
22	Left	13852.156	254526.482	2143809.273	7.131	100	10000	0	154.82	0.000	0.000	2.500		13774.746	13929.584	
23	Right	14550.565	253831.359	2143741.573	8.969	100	50000	0	220.64	0.000	0.000	2.500		14440.246	14660.883	
24	Left	14925.101	253458.43	2143706.914	0.515	100	20000	0	186.26	0.000	0.000	2.500		14830.972	15019.229	
25	Right	15141.711	253242.946	2143684.839	0.827	100	5000	0	69.24	0.000	0.000	2.500		15107.091	15176.33	
26	Left	15363.53	253021.989	2143665.292	0.272	100	15000	0	154.68	0.000	0.000	2.500		15286.19	15440.868	
27	Right	15673.813	252713.211	2143634.763	0.201	100	5000	0	85.68	0.000	0.000	2.500		15630.973	15716.65	
28	Left	15916.206	252471.618	2143615.05	0.650	100	20000	0	153.41	0.000	0.000	2.500		15839.502	15992.909	
29	Right	16489.696	251900.401	2143564.028	5.214	100	6500	0	247.02	0.000	0.000	2.500		16366.17	16613.193	
30	Left	17174.291	251216.67	2143529.072	10.631	100	25000	0	182.74	0.000	0.000	2.500		17082.92	17265.661	
31	Right	17785.048	250606.953	2143493.429	0.651	100	15000	0	101.21	0.000	0.000	2.500		17734.445	17835.651	
32	Left	18294.373	250098.307	2143467.137	21.643	100	2500	0	216.74	0.000	0.000	2.500		18185.934	18402.676	18909.68
33	Right	18808.755	249588.323	2143399.735	5.919	100	500	95	11.85	0.752	47.486	7.000	18707.83	18802.83	18814.68	
34	Right	19131.745	249266.093	2143420.486	0.316	100	10000	0	261.17	0.000	0.000	2.500		19001.155	19262.32	
35	Left	20308.442	248095.113	2143353.881	0.203	100	800	60	163.37	0.187	29.999	5.556	20166.474	20226.474	20389.84	20449.84
36	Right	21409.344	247009.396	2143350.814	6.699	100	1000	50	437.67	0.104	24.999	4.444	21136.949	21186.949	21624.616	21674.616
37	Left	21799.634	246629.165	2143466.311	0.545	100	1800	0	139.08	0.000	0.000	2.500		21730.06	21869.139	
38	Right	22063.421	246372.419	2143527.15	0.432	100	2500	0	373.79	0.000	0.000	2.500		21876.178	22249.967	
39	Right	22567.122	245904.412	2143715.265	0.378	100	2800	0	269.63	0.000	0.000	2.500		22432.204	22701.83	
40	Left	24202.414	244450.959	2144465.031	0.477	100	800	60	154.32	0.187	29.999	5.556	24065.015	24125.015	24279.334	24339.334
41	Right	24623.659	244042.181	2144565.081	0.477	40	90	55	21.03	1.396	27.415	7.000	24558.097	24613.097	24634.125	24689.125
42	Left	25394.495	243849.486	2145227.039	5.904	80	240	90	10.84	1.004	44.947	7.000	25299.072	25389.072	25399.915	25489.915
43	Left	26282.644	242937.632	2145757.462	0.462	100	1500	35	315.27	0.034	17.500	2.963	26089.428	26124.428	26439.694	26474.694
44	Right	26634.228	242609.728	2145898.884	0.568	100	2000	0	252.06	0.000	0.000	2.500		26508.029	26760.092	
	Left	27014.8	242280.632	2146090.679	11.530	100	25000	0	247.10	0.000	0.000	2.500		26891.249	27138.349	



Chief Engineer
World Bank Projects, Odisha
EMPLOYER

PROJECT:-

ORISSA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE.

HORIZONTAL CURVE DETAILS

BERHAMPUR TO BANGI Jn. (SH-17, KM 0 TO 41)

DATE NO	08/09/2017	REV IN	
SH. NO.	G	DATE	
SCALE	NTS	REV	RI
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M/s RKD Construction
CONTRACTOR

World Bank Projects, Odisha

EMPLOYER

Chief Engineer,
Project
to the E.I.C.(Civil), Odisha
Bhubaneswar.

Curve No.	Curve Direction	Chainage	HIP Details		Total Deviation Angle	Design Speed (Km/Hr)	Curve Radius (m.)	Transition Length (m.)	Circular Curve Length (m.)	Shift	Distance from TP to PC	Straight Superelevation (%)	Transition Start Chainage	Circular Start Chainage	Circular End Chainage	Transition End Chainage
			Easting	Northing	Δ	V	Rc	Ls	Lc	S	k	e	TS	SC	CS	ST
46	Left	27347.662	241991.401	2146255.433	0.588	100	7000	0	113.52	0.000	0.000	2.500	27290.898	27404.423	27404.423	27404.423
47	Left	27816.787	241580.056	2146480.99	0.246	100	10000	0	169.43	0.000	0.000	2.500	27732.069	27901.501	27901.501	27901.501
48	Right	28124.301	241307.948	2146624.256	0.213	100	10000	0	285.64	0.000	0.000	2.500	27981.474	28267.11	28267.11	28267.11
49	Left	28709.166	240798.407	2146911.409	0.248	100	15000	0	343.23	0.000	0.000	2.500	28537.546	28880.772	28880.772	28880.772
50	Right	29196.966	240369.085	2147142.941	0.050	80	500	50	50.19	0.208	24.998	5.669	29121.848	29222.041	29222.041	29272.041
51	Left	29525.370			18.90	80	500	24	140.86	0.0	0	7.000	29429.52	29594.38	29594.38	29618.38
53	Right	30137.355	239539.356	2147567.482	8.112	100	13000	0	249.22	0.000	0.000	2.500	30012.74	30261.961	30261.961	30261.961
54	Left	30419.145	239277.446	2147671.466	4.350	100	9000	0	248.41	0.000	0.000	2.500	30294.934	30543.341	30543.341	30543.341
55	Right	30676.001	239037.871	2147763.814	0.262	100	500	90	40.28	0.675	44.988	7.000	30655.852	30696.128	30696.128	30786.128
56	Left	31051.952	238727.438	2147975.691	0.529	100	50000	0	385.27	0.000	0.000	2.500	30859.316	31244.587	31244.587	31244.587
57	Right	31509.794	238350.39	2148235.413	0.906	100	50000	0	237.60	0.000	0.000	2.500	31390.993	31628.595	31628.595	31628.595
58	Left	31843.551	238076.433	2148426.049	26.722	100	25000	0	169.51	0.000	0.000	2.500	31758.794	31928.308	31928.308	31928.308
59	Left	32492.697	237541.097	2148793.207	6.979	100	2200	0	225.06	0.000	0.000	2.500	32380.068	32605.129	32605.129	32605.129
60	Right	32953.972	237135.866	2149013.987	17.814	100	35000	0	189.36	0.000	0.000	2.500	32859.293	33048.65	33048.65	33048.65
61	Right	33356.75	236784.028	2149210.006	0.255	100	800	60	46.51	0.187	29.999	5.556	33273.487	33333.487	33333.487	33380
62	Right	33934.65	236321.851	2149556.631	0.083	80	500	90	54.14	0.675	44.988	5.689	33907.555	33961.692	33961.692	34051.692
63	Left	34408.419	236020.942	2149921.697	0.317	100	400	120	130.05	1.499	59.955	7.000	34222.814	34342.814	34342.814	34472.866
64	Right	34753.516	235697.02	2150042.399	0.341	100	500	95	12.48	0.752	47.486	7.000	34652.274	34747.274	34759.758	34854.758
65	Right	35352.787	235173.958	2150334.648	0.791	100	25000	0	229.63	0.000	0.000	2.500	35237.969	35467.603	35467.603	35467.603
66	Right	36008.855	234606.15	2150663.314	0.295	100	10000	0	288.14	0.000	0.000	2.500	35874.775	36142.919	36142.919	36142.919
67	Right	36460.641	234223.85	2150904.027	0.448	100	1000	50	339.60	0.104	24.999	4.444	36239.188	36628.793	36628.793	36678.793
68	Left	36975.986	233910.68	2151317.285	10.480	80	400	60	94.40	0.375	29.994	7.000	36868.568	37022.963	37022.963	37082.963
69	Right	37615.478	233372.717	2151663.338	2.861	80	500	90	62.09	0.675	44.988	5.689	37584.391	37646.485	37646.485	37736.485
70	Right	38422.312	232841.815	2152270.761	0.522	100	15000	0	151.15	0.000	0.000	2.500	38346.734	38497.888	38497.888	38497.888
71	Right	38740.341	232636.596	2152513.719	9.184	100	25000	0	150.19	0.000	0.000	2.500	38665.246	38815.437	38815.437	38815.437
72	Left	38999.669	232470.45	2152712.834	22.009	100	13000	0	289.29	0.000	0.000	2.500	38855.019	39144.308	39144.308	39144.308
73	Right	39363.852	232230.953	2152987.205	5.851	100	10000	0	182.54	0.000	0.000	2.500	39272.579	39455.121	39455.121	39455.121
74	Left	39646.472	232049.015	2153203.48	0.437	100	8000	0	169.35	0.000	0.000	2.500	39561.793	39731.144	39731.144	39731.144
75	Right	40013.561	231806.806	2153479.331	0.793	100	15000	0	238.54	0.000	0.000	2.500	39894.291	40132.827	40132.827	40132.827
76	Left	40415.422	231542.798	2153782.235	17.102	100	800	60	221.09	0.187	29.999	5.556	40244.168	40525.258	40525.258	40585.258
77	Right	40961.285	231069.502	2154056.892	0.323	100	1000	50	55.81	0.104	24.999	4.444	40883.373	40989.182	40989.182	41039.182
78	Left	41375.842	230727.287	2154288.896	0.634	50	125	60	36.48	1.198	29.942	7.000	41297.1	41393.581	41393.581	41453.581
79	Right	41594.842	230519.447	2154280.139	1.155	50	90	75	15.90	2.588	37.284	7.000	41501.87	41592.772	41592.772	41667.772
80	Left	41835.781	230342.258	2154455.879	0.529	80	400	60	113.98	0.375	29.994	7.000	41718.402	41892.382	41892.382	41952.382
81	Right	42274.965	229952.861	2154658.866	0.364	65	200	60	197.67	0.749	29.978	7.000	42107.21	42167.21	42167.21	42242.884
82	Left	42502.061	229962.998	2154903.155	0.475	65	200	60	30.62	0.749	29.978	7.000	42426.719	42486.719	42486.719	42577.343
83	Right	42805.646	229875.599	2155193.684	0.227	100	1000	50	17.62	0.104	24.999	4.444	42746.836	42796.836	42796.836	42864.456
84	Left	42978.311	229829.518	2155359.971	7.675	80	300	75	12.23	0.781	37.480	7.000	42897.193	42972.193	42984.427	43059.427

Chief Engineer

HORIZONTAL CURVE DETAILS			
BERHAMPUR TO BANGI Jn. (SH-17, KM 0 TO 41)			
DRG NO	DATE	REV	BY
SH. NO.	G	R1	APPROVED BY
SCALE	N.T.S		DATE
CL. WORK BOOK PROFILES			

ORISSA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE.

Curve No.	Curve Type	VIP Details		Curve Length	K	Curve Start		Curve End		Start Gradient %	End Gradient %
		Chainage	Level			Chainage	Level	Chainage	Level		
1	Valley	43.358	56.121	60	85.45	356.891	56.015	469.391	56.016	-0.352	-0.35
2	Summit	394.391	54.892	75	109.476	925.133	55.024	1025.133	55.018	-0.35	0.335
3	Valley	975.133	56.839	100	695.227	1770.534	56.671	1800.534	56.935	0.335	0.191
4	Valley	1896.413	58.361	60	210.917	1866.413	58.304	1926.413	58.333	0.191	-0.093
5	Summit	1992.899	58.244	60	135.532	1962.899	58.272	2022.899	58.349	-0.093	0.35
6	Summit	2112.33	58.581	60	82.973	1962.899	58.476	2022.899	58.903	0.35	1.073
7	Valley	2417.913	59.862	60	64.38	2082.33	59.54	2142.33	59.904	1.073	0.141
8	Valley	2833.802	60.292	100	631.214	2367.913	60.222	2467.913	60.283	0.141	-0.018
9	Summit	3258.497	60.219	60	85.07	2863.802	60.224	2863.802	60.425	-0.018	0.688
10	Valley	3401.236	63.139	60	262.614	3228.497	62.933	3288.497	63.277	0.688	0.459
11	Summit	3598.38	63.794	60	750.697	3371.236	63.657	3431.236	63.956	0.459	0.539
12	Summit	3958.007	64.857	100	857.548	3548.38	64.587	3648.38	65.185	0.539	0.656
13	Summit	4205.498	67.215	150	133.622	3883.007	66.723	4033.007	68.549	0.656	1.778
14	Valley	4487.992	71.616	300	238.698	4055.498	68.949	4355.498	72.398	1.778	0.521
15	Summit	4668.171	73.089	75	61.06	4450.492	72.893	4525.492	73.745	0.521	1.75
16	Valley	5121.177	76.242	75	122.745	4630.671	75.585	4705.671	76.669	1.75	1.139
17	Valley	5481.377	81.4	600	281.019	4821.177	77.984	5421.177	78.411	1.139	-0.996
18	Summit	5922.397	77.811	100	87.465	5481.377	78.309	5531.377	77.884	-0.996	0.147
19	Summit	6957.573	78.459	120	89.614	5862.397	78.371	5982.397	79.351	0.147	1.486
20	Valley	7370.995	93.842	160	139.252	6877.573	92.653	7037.573	94.111	1.486	0.337
21	Valley	8029.914	95.235	150	199.734	7295.995	94.982	7445.995	94.924	0.337	-0.414
22	Valley	8250.614	94.529	60	132.45	7511.615	94.653	7571.615	94.268	-0.414	-0.867
23	Valley	8489.034	90.295	60	323.193	7999.914	90.555	8059.914	89.979	-0.867	-1.053
24	Valley	8977.22	87.972	60	72.706	8220.614	88.288	8280.614	87.408	-1.053	-1.878
25	Summit	9373.595	83.495	400	117.673	8289.034	87.25	8689.034	86.537	-1.878	1.521
26	Valley	9621.656	96.948	120	78.789	9313.595	96.039	9433.595	96.951	1.521	-0.002
27	Summit	10100.904	96.948	100	125.481	9571.656	96.948	9671.656	97.345	-0.002	0.795
28	Valley	10448.99	99.139	60	36.294	9897.22	98.9	9972.22	98.882	0.795	-0.858
29	Valley	10729.528	97.392	75	130.844	10063.404	97.713	10138.404	96.855	-0.858	-1.431
30	Valley	11224.435	92.41	100	312.399	10398.99	93.126	10498.99	91.534	-1.431	-1.751
31	Summit	11573.923	87.497	60	87.853	10699.528	88.022	10759.528	87.177	-1.751	-1.068
32	Summit	11798.537	82.21	75	58.283	11186.935	82.611	11261.935	82.292	-1.068	0.219
33	Valley	11944.432	82.846	60	217.755	11543.923	82.908	11603.923	82.957	0.219	-0.057
34	Summit	12222.251	82.846	60	55.751	11768.537	82.863	11828.537	83.152	-0.057	1.019
35	Valley	12378.843	85.657	100	184.312	11894.432	83.823	11994.432	84.571	1.019	0.477
36	Summit	12633.947	86.753	60	268.813	12192.251	85.514	12252.251	85.867	0.477	0.7
37	Valley	12827.079	86.91	75	117.48	12341.343	86.491	12416.343	86.776	0.7	0.061
38	Summit	12988.283	89.085	60	56.353	12603.947	86.892	12663.947	87.248	0.061	1.126
39	Valley	13263.029	89.085	100	67.938	12777.079	88.522	12877.079	88.912	1.126	-0.346
40	Summit	13504.152	89.706	60	77.464	12958.283	88.631	13018.283	88.656	-0.346	0.429
41	Summit	13662.602	89.706	60	285.808	13233.029	89.577	13293.029	89.897	0.429	0.639
42	Valley	13928.08	91.246	80	47.13	13464.152	90.912	13544.152	90.822	0.639	-1.059
43	Summit	14033.47	89.568	65	86.545	13630.102	89.912	13695.102	89.468	-1.059	-0.308
44	Valley	14033.47	88.752	60	91.987	13898.08	88.844	13958.08	88.464	-0.308	-0.96
45	Summit	14033.47	87.74	50	82.175	14008.47	87.98	14058.47	87.652	-0.96	-0.351

VERTICAL CURVE DETAILS
BERHAMPUR TO BANGI Jn. (SH-17, KM 0 TO 41)

DRG NO.	DATE	REV	RT	NTS
SH. NO.	G			
SCALE				
DESIGNED BY				
CHECKED BY				
APPROVED BY				
DATE				

ORISSA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE.


M/s RKD Construction
CONTRACTOR



Chief Engineer
World Bank Projects, Odisha
EMPLOYER

Chief Engineer
O/o the E.I.C.(Civil), Odisha
Bhubaneswar.

Curve No.	Curve Type	VIP Details		Curve Length	K	Curve Start		Curve End		Start Gradient %	End Gradient %
		Chainage	Level			Chainage	Level	Chainage	Level		
46	Summit	14195.221	87.172	50	43.486	14170.221	87.259	14220.221	87.371	-0.351	0.798
47	Valley	14396.434	88.778	60	126.3	14366.434	88.538	14426.434	88.875	0.798	0.323
48	Summit	14497.658	89.105	60	159.811	14467.658	89.008	14527.658	89.315	0.323	0.699
49	Valley	14808.902	91.28	60	464.095	14778.902	91.07	14838.902	91.451	0.699	0.569
50	Valley	14943.036	92.044	120	76.799	14883.036	91.702	15003.036	91.448	0.569	-0.993
51	Summit	15113.6	90.35	160	161.117	15033.6	91.144	15193.6	90.35	-0.993	0
52	Summit	15228.32	90.35	50	123.14	15203.32	90.35	15253.32	90.452	0	0.406
53	Valley	15313.04	90.694	50	136.341	15288.04	90.592	15338.04	90.704	0.406	0.039
54	Summit	15448.82	90.747	50	82.281	15423.82	90.738	15473.82	90.909	0.039	0.647
55	Valley	15650	92.049	70	111.644	15615	91.823	15685	92.056	0.647	0.02
56	Valley	15875	92.094	70	294.349	15840	92.087	15910	92.018	0.02	-0.218
57	Valley	16097.209	91.61	60	184.896	16067.209	91.675	16127.209	91.447	-0.218	-0.542
58	Summit	16270.924	90.668	50	80.825	16245.924	90.803	16295.924	90.687	-0.542	0.076
59	Summit	16628.853	90.941	60	89.013	16598.853	90.918	16658.853	91.166	0.076	0.75
60	Valley	16788.11	92.136	100	97.519	16738.11	91.761	16838.11	91.998	0.75	-0.275
61	Valley	17073.914	91.35	200	235.923	16973.914	91.625	17173.914	90.227	-0.975	-1.123
62	Valley	17444.124	87.193	100	1347.582	17394.124	87.754	17494.124	86.594	-1.123	-1.197
63	Summit	17726.592	83.812	60	44.187	17696.592	84.171	17756.592	83.86	-1.197	0.161
64	Summit	18094.3	84.403	60	43.018	18064.3	84.355	18124.3	84.87	0.161	1.556
65	Valley	18364.559	88.607	120	158.751	18304.559	87.674	18424.559	89.087	1.556	0.8
66	Summit	18632.24	90.748	50	94.368	18607.24	90.548	18657.24	91.08	0.8	1.33
67	Valley	18805.2	93.048	50	164.557	18780.2	92.715	18830.2	93.304	1.33	1.026
68	Valley	19011.36	95.162	200	93.848	18911.36	94.136	19111.36	94.057	1.026	-1.105
69	Summit	19157.728	93.544	60	64.305	19127.728	93.876	19187.728	93.492	-1.105	-0.172
70	Summit	19816.343	92.409	200	105.236	19716.343	92.581	19916.343	94.137	-0.172	1.728
71	Valley	20099.712	97.306	200	99.555	19999.712	95.578	20199.712	97.025	1.728	-0.281
72	Valley	20622.097	95.839	150	156.406	20547.097	96.05	20697.097	94.909	-0.281	-1.24
73	Valley	20940.923	91.886	100	553.519	20890.923	92.506	20990.923	91.176	-1.24	-1.421
74	Summit	21545.912	83.292	100	68.642	21495.912	84.002	21595.912	83.31	-1.421	0.036
75	Summit	22188.805	83.525	350	448.013	22013.805	83.462	22363.805	84.956	0.036	0.818
76	Valley	22593.13	86.831	200	427.694	22493.13	86.013	22693.13	87.181	0.818	0.35
77	Valley	23429.038	89.756	150	209.574	23354.038	89.494	23504.038	89.482	0.35	-0.366
78	Summit	23761.772	88.539	60	51.248	23731.772	88.649	23791.772	88.78	-0.366	0.805
79	Summit	24360.09	93.355	60	181.33	24330.09	93.114	24390.09	93.696	0.805	1.136
80	Valley	24650.182	96.65	75	138.063	24612.682	96.224	24687.682	96.872	1.136	0.593
81	Summit	24833.394	97.736	60	85.153	24803.394	97.558	24863.394	98.125	0.593	1.297
82	Summit	25266.385	103.353	60	160.538	25236.385	102.963	25296.385	103.854	1.297	1.671
83	Valley	25594.299	108.832	200	180.669	25494.299	107.161	25694.299	109.396	1.671	0.564
84	Summit	26005.132	111.149	200	246.511	25905.132	110.585	26105.132	112.524	0.564	1.375
85	Valley	26362.654	116.066	140	86.433	26292.654	115.103	26432.654	115.895	1.375	-0.244
86	Valley	26725	115.175	150	133.559	26650	115.36	26800	114.147	-0.244	-1.37
87	Summit	27685.953	102.007	140	95.481	27615.953	102.966	27755.953	102.074	-1.37	0.096
88	Valley	28233.713	102.533	200	162.251	28133.713	102.437	28333.713	101.396	0.096	-1.137
89	Summit	28878.485	95.204	250	93.9	28753.485	96.625	29003.485	97.111	-1.137	1.526
90	Valley	29199.381	100.1	100	65.542	29149.381	99.337	29249.381	100.1	1.526	0


M/s RKD Construction
CONTRACTOR




Chief Engineer
World Bank Projects, Odisha
EMPLOYER

VERTICAL CURVE DETAILS
BERHAMPUUR TO BANGI Jn. (SH-17, KM 0 TO 41)

DRG NO.	DATE	REV.	BY	APPROVED
SH. NO.	G			
SCALE				

NTS

ORISSA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE.

[Signature]

M/s RKD Construction
CONTRACTOR



[Signature]
Chief Engineer
World Bank Projects, Odisha
EMPLOYER

Chief Engineer
World Bank Project
Page 74 of 135
110 the E.P.C. (Civil), Odisha
Bhubaneswar.

Curve No.	Curve Type	VIP Details		Curve Length	K	Curve Start		Curve End		Start Gradient %	End Gradient %
		Chainage	Level			Chainage	Level	Chainage	Level		
91	Valley	29459.885	100.1	120	104.433	29399.885	100.1	29519.885	99.411	0	-1.149
92	Summit	29742.562	96.852	120	103.023	29682.562	97.541	29802.562	96.861	-1.149	0.016
93	Summit	30848.743	97.026	100	133.248	30798.743	97.018	30898.743	97.409	0.016	0.766
94	Valley	32089.404	106.532	200	436.811	31989.404	105.766	32189.404	106.84	0.766	0.308
95	Summit	32547.002	107.943	250	227.028	32422.002	107.558	32672.002	109.705	0.308	1.41
96	Valley	32738.413	110.641	120	131.78	32678.413	109.795	32798.413	110.94	1.41	0.499
97	Valley	33112.791	112.509	200	152.874	33012.791	112.01	33212.791	111.7	0.499	-0.809
98	Summit	33509.892	109.295	150	67.541	33434.892	109.902	33584.892	110.354	-0.809	1.412
99	Valley	33751.817	112.71	100	86.415	33701.817	112.004	33801.817	112.837	1.412	0.254
100	Summit	34007.462	113.36	85	66.768	33964.962	113.252	34049.962	114.009	0.254	1.527
101	Valley	34354.925	118.667	600	258.268	34054.925	114.085	34654.925	116.28	1.527	-0.796
102	Summit	34722.43	115.743	100	54.278	34672.43	116.14	34772.43	116.266	-0.796	1.047
103	Valley	35243.127	121.192	300	1648.985	35093.127	119.622	35393.127	122.489	1.047	0.865
104	Valley	36160.152	129.121	600	568.87	35860.152	126.527	36460.152	128.551	0.865	-0.19
105	Summit	36581.029	128.321	200	184.558	36481.029	128.511	36681.029	129.215	-0.19	0.894
106	Valley	36812.825	130.392	200	115.025	36712.825	129.499	36912.825	129.547	0.894	-0.845
107	Summit	37113.869	127.848	200	130.133	37013.869	128.693	37213.869	128.54	-0.845	0.692
108	Summit	37827.883	132.787	300	504.294	37677.883	131.749	37977.883	134.717	0.692	1.287
109	Valley	38558.949	142.193	300	546.646	38408.949	140.263	38708.949	143.3	1.287	0.738
110	Valley	39270.105	147.44	300	1565.113	39120.105	146.333	39420.105	148.259	0.738	0.546
111	Summit	39706.189	149.822	200	488.124	39606.189	149.275	39806.189	150.777	0.546	0.956
112	Summit	40218.451	154.718	400	482.002	40018.451	152.806	40418.451	158.29	0.956	1.786
113	Valley	40897.659	166.847	600	259.136	40597.659	161.49	41197.659	165.258	1.786	-0.53

VERTICAL CURVE DETAILS
BERHAMPUR TO BANGI Jr. (SH-17, KM 0 TO 41)

DRG. NO.	058P/CC/SH-17/02/03	REV. NO.		DATE		REV.	RI	NTS
SH. NO.	G	REVISED BY						
SCALE		REVISED IN						
		DATE						

ORISSA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE.

Kilometer wise Details of Attempted* Highway Works for calculating balance work.

Chainage(km)	Earth Work (Mtr)		Sub Grade (Mtr)		GSB (Mtr)		WNMM		DBM		BC	
	LHS	RHS	LHS	RHS	LHS	RHS	LHS	RHS	LHS	RHS	LHS	RHS
1.000												
2.000												
3.000												
4.000												
5.000												
6.000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
7.000	680	680	680	680	680	680	680	680	680	680		
8.000	610	590	610	470	490	320	490	320	490	320		
9.000	800	570	570	570	570	570	570	570	570	570		
10.000	240	430	240	290	240	290	240	290	240	290		
11.000	170	270	170	130	470	690	470	690	470	690		
12.000	1000	1000	1000	1000	900	1000	900	1000	900	1000		
13.000	330	330	330	330	330	330	330	330	330	330		
14.000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
15.000	740	720	740	720	740	720	740	720	740	720		
16.000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
17.000	250	250	250	250	250	250	250	250	250	250		
18.000												
19.000		20		20		20		20		20		
20.000	500	510	500	510	510	510	510	510	510	510		
21.000	310	700	520									
22.000	220											
23.000												
24.000												
25.000												
26.000												
27.000												
28.000												
29.000												
30.000												
31.000												
32.000												
33.000												
34.000												
35.000												
36.000												
37.000	300	680										
38.000	600	930										
39.000	70	680										
40.000	770	570										
Total	11950	12240	9220	8660	7670	8380	7670	8380	7670	8380		
Balance works to be done in Meters	29050	28760	31780	32340	33330	32620	33330	32620	33330	32620	41000	41000

M/s RKD Construction
CONTRACTOR



Chief Engineer
World Bank Projects, Odisha
EMPLOYER

Chief Engineer
World Bank Project
O/o the E.I.C.(Civil), Odisha
Bhubaneswar.

S. No.	Location/ Chainage	Design Chainage	Remarks
1	1/915	1/925	To be Started
2	4/400	4/370	To be Started
3	11/270	11/286	Abntment and Slab cast. Balance to be done.
4	11/660	11/735	To be Started
5	15/185	15/196	To be Started
6	15/680	15/727	To be Started
7	17/900	17/851	To be Started
8	21/850	21/731	To be Started
9	29/230	29/278	To be Started

PROJECT :-

ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE.

ATTEMPTED LENGTHS OF HIGHWAY WORKS
BERHAMPUR TO TAPTAPANI (SH-17, KM 0 TO 41)

DIRC NO	OSRP/CEG/SH-17/BM 01	REV. NO	REV. BY
SH. NO	K	DATE	REV
SCALE			EC/PM
			CCG USA
			APPROVED
			CE, World Bank Projects.

NTS

Status of Culvert & Utility Ducts for balance works.

S. No.	Location/Chainage	Proposed Chainage	Present Status
22	6090	6069	Protection work such as dry stone pitching for bed and aprons and other small miscellaneous works to be done.
23	5775	5761	Rectification of part of parapet and return walls, protection work such as curtain walls, dry stone pitching for aprons, expansion joints, etc. to be done.
24	6090	6069	Protection work such as dry stone pitching for bed and aprons and other small miscellaneous works to be done.
25	6554	6497	do
26	6590	6573	do
27	7020	7000	do
28	7240	7217	do
29	7540	7520	do
30	7630	7605	IHS extension completed, RHS extension to be done including bed protection works for both sides.
31	7795	7769	Protection work such as dry stone pitching for aprons, pillars for inscribing structure number, and painting are not done.
32	8030	8008	Excavation of foundations completed, balance items are to be executed.
33	8210	8193	Protection work such as dry stone pitching for bed and aprons and other small miscellaneous works to be done.
34	8385	8363	Protection work such as dry stone pitching for bed and aprons and other small miscellaneous works to be done.
35	8550	8530	Protection work such as curtain walls, aprons for bed, protections, back filling, filter media, providing expansion joints are to be done.
36	8700	8685	Protection work such as dry stone pitching for aprons, pillars for inscribing structure number, and painting are not done.

Status of Culvert & Utility Ducts for balance works.

S. No.	Location/Chainage	Proposed Chainage	Present Status
37	9175	9152	Rectification of part of parapet and return walls, protection work such as curtain walls, dry stone pitching for aprons, expansion joints, etc. to be done.
38	9600	9538	Protection work such as dry stone pitching for aprons, pillars for inscribing structure number, and painting are to be done.
39	9810	9786	Not Started
40	10465	10933	Rectification of part of parapet and return walls, protection work such as curtain walls, dry stone pitching for aprons, expansion joints, etc. to be done.
41	11120	11120	Protection work such as dry stone pitching for aprons are to be done.
42	11500	11500	do
43	12040	12065	do
44	12380	12407	do
45	12585	12611	do
46	12880	12907	do
47	13110	13132	do
48	13450	13470	Not Started
49	13600	13619	Protection work such as dry stone pitching for aprons, pillars for inscribing structure number, and painting are to be done.
50	13790	13809	do
51	13895	13916	do
52	14135	14157	Rectification of part of parapet and return walls, protection work such as curtain walls, dry stone pitching for aprons, expansion joints, etc. to be done.
53	14510	14531	Protection work such as dry stone pitching for aprons are to be done.
54	14855	14877	do
55	15430	15440	do
56	15880	15897	do
57	16050	16068	do
58	16400	16417	do
59	16505	16521	do
60	16750	16770	do
61	16950	16970	do
62	17650	17666	do
63	18070	18028	Rectification of part of parapet and return walls, protection work such as curtain walls, dry stone pitching for aprons, expansion joints, etc. to be done.
64	18105	18115	Rectification of part of parapet and return walls, protection work such as curtain walls, dry stone pitching for aprons, expansion joints, etc. to be done.
65	18470	18480	Not Started
66	19240	19192	Not Started
67	19430	19382	Not Started
68	19570	19530	Not Started

Status of Culvert & Utility Ducts for balance works.

S. No.	Location/Chainage	Proposed Chainage	Present Status
69	19845	19799	Protection work such as dry stone pitching for aprons are to be done.
70	20355	20361	do
71	20610	20614	Not Started
72	20930	20935	Protection work such as dry stone pitching for aprons are to be done.
73	21015	21005	do
74	21230	21224	do
75	21420	21411	do
76	21875	21865	Not Started
77	22210	22189	Not Started
78	22605	22582	Not Started
79	22790	22761	Not Started
80	22985	22961	Not Started
81	23180	23147	Not Started
82	23300	23255	Not Started
83	23750	23713	Not Started
84	23850	23821	Not Started
85	24365	24351	Not Started
86		LHS	Not Started
87		RHS	Not Started
88	241020	25106	Not Started
89	25050	25214	Not Started
90	25695	25861	Not Started
91	25905	26072	Not Started
92	26150	26314	Not Started
93	26430	26612	Not Started
94	26850	27026	Not Started
95	27600	27743	Not Started
96	27850	28008	Not Started
97	28375	28547	Not Started
98	28800	28954	Not Started
99		29561	Not Started
100	30060	30241	Not Started
101	30460	30637	Not Started
102	30720	30889	Not Started
103	31960	32128	Not Started
104	32300	32465	Not Started
105	33270	33402	Not Started
106	33310	33476	Not Started
107	33806	33976	Not Started
108	33900	34069	Not Started
109	34750	34663	Not Started
110	34825	34670	Not Started
111	34640	34813	Not Started
112	34675	34838	Not Started
113	35204	35378	Not Started
114	35350	35533	Not Started
115	35825	36003	Not Started
116	36060	36238	Not Started
117	36220	36358	Not Started
118	36500	36594	Not Started
119	36575	36758	Not Started
120	36800	36961	Not Started
121	36940	37164	Protection work such as dry stone pitching for aprons are to be done.
122	37440	37619	do
123	37985	38157	do

Status of Culvert & Utility Ducts for balance works.

S. No.	Location/Chainage	Proposed Chainage	Present Status
124	38450	38483	Excavation of foundations completed, balance items are to be executed.
125	38600	38746	Protection work such as dry stone pitching for aprons are to be done.
126	38810	39002	do
127	39360	39118	do
128	39340	39517	do
129	39455	39671	do
130	39900	40090	do
131	40000	40280	do
132	40240	40437	do
133	40420	40550	do
134	40815	41000	do

M/S RKS Construction
INSURANCE CONTRACTOR

Chief Engineer
Projects, Odisha
World Bank Project
O/o In-charge
Bhubaneswar.

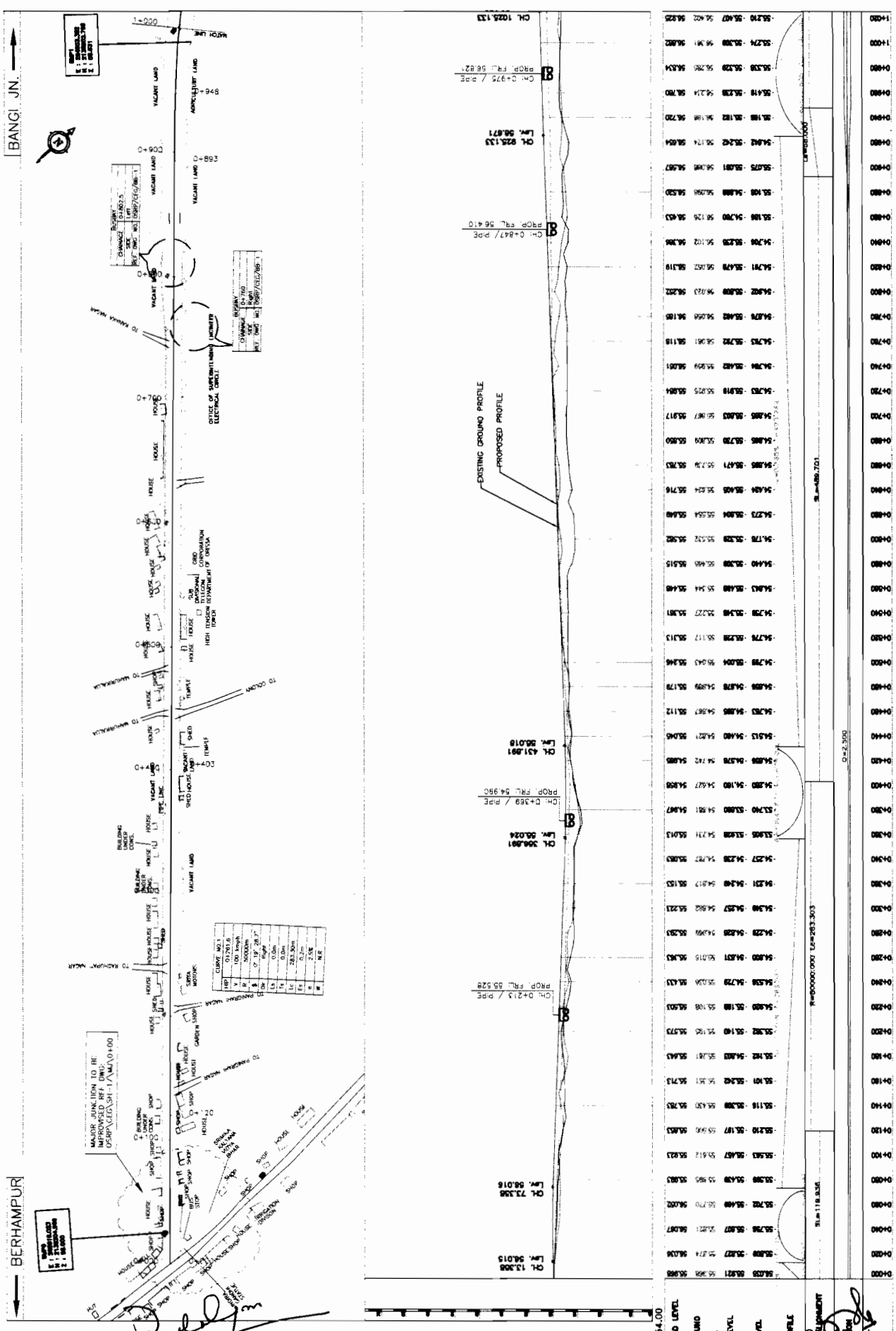
PROJECT :-

ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE.

SCHEDULE OF BALANCE WORK(CD WORKS)
BERHAMPUR TO TAPTAPANI (SH-17, KM 0 TO 41)

DRG NO	OSRP/GE/SH-17/BW 02	REV NO	REV	REV DATE	REV BY	APPROVED
SCALE		DATE	REV	REV	CE/PMU	CE, World Bank Projects.

NTS



STATION	RIGHT LEVEL	EXISTING GROUND	PROPOSED CL	LEFT LEVEL	VERTICAL CURVE
0+000	54.928	54.927	54.928	54.928	
0+020	54.928	54.927	54.928	54.928	
0+040	54.928	54.927	54.928	54.928	
0+060	54.928	54.927	54.928	54.928	
0+080	54.928	54.927	54.928	54.928	
0+100	54.928	54.927	54.928	54.928	
0+120	54.928	54.927	54.928	54.928	
0+140	54.928	54.927	54.928	54.928	
0+160	54.928	54.927	54.928	54.928	
0+180	54.928	54.927	54.928	54.928	
0+200	54.928	54.927	54.928	54.928	
0+220	54.928	54.927	54.928	54.928	
0+240	54.928	54.927	54.928	54.928	
0+260	54.928	54.927	54.928	54.928	
0+280	54.928	54.927	54.928	54.928	
0+300	54.928	54.927	54.928	54.928	
0+320	54.928	54.927	54.928	54.928	
0+340	54.928	54.927	54.928	54.928	
0+360	54.928	54.927	54.928	54.928	
0+380	54.928	54.927	54.928	54.928	
0+400	54.928	54.927	54.928	54.928	
0+420	54.928	54.927	54.928	54.928	
0+440	54.928	54.927	54.928	54.928	
0+460	54.928	54.927	54.928	54.928	
0+480	54.928	54.927	54.928	54.928	
0+500	54.928	54.927	54.928	54.928	
0+520	54.928	54.927	54.928	54.928	
0+540	54.928	54.927	54.928	54.928	
0+560	54.928	54.927	54.928	54.928	
0+580	54.928	54.927	54.928	54.928	
0+600	54.928	54.927	54.928	54.928	
0+620	54.928	54.927	54.928	54.928	
0+640	54.928	54.927	54.928	54.928	
0+660	54.928	54.927	54.928	54.928	
0+680	54.928	54.927	54.928	54.928	
0+700	54.928	54.927	54.928	54.928	
0+720	54.928	54.927	54.928	54.928	
0+740	54.928	54.927	54.928	54.928	
0+760	54.928	54.927	54.928	54.928	
0+780	54.928	54.927	54.928	54.928	
0+800	54.928	54.927	54.928	54.928	
0+820	54.928	54.927	54.928	54.928	
0+840	54.928	54.927	54.928	54.928	
0+860	54.928	54.927	54.928	54.928	
0+880	54.928	54.927	54.928	54.928	
0+900	54.928	54.927	54.928	54.928	
0+920	54.928	54.927	54.928	54.928	
0+940	54.928	54.927	54.928	54.928	
0+960	54.928	54.927	54.928	54.928	
0+980	54.928	54.927	54.928	54.928	
1+000	54.928	54.927	54.928	54.928	

WIDENING AND STRENGTHENING TO TWO LANE
 PLAN AND LONGITUDINAL SECTION
 BERHAMPUR TO BANGI Jn. (SH-17) KM 0/000 TO KM 1/000

DRG NO.	01	DATE	10.12.2012	REV	R1
SHT. NO.					

ORISSA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE

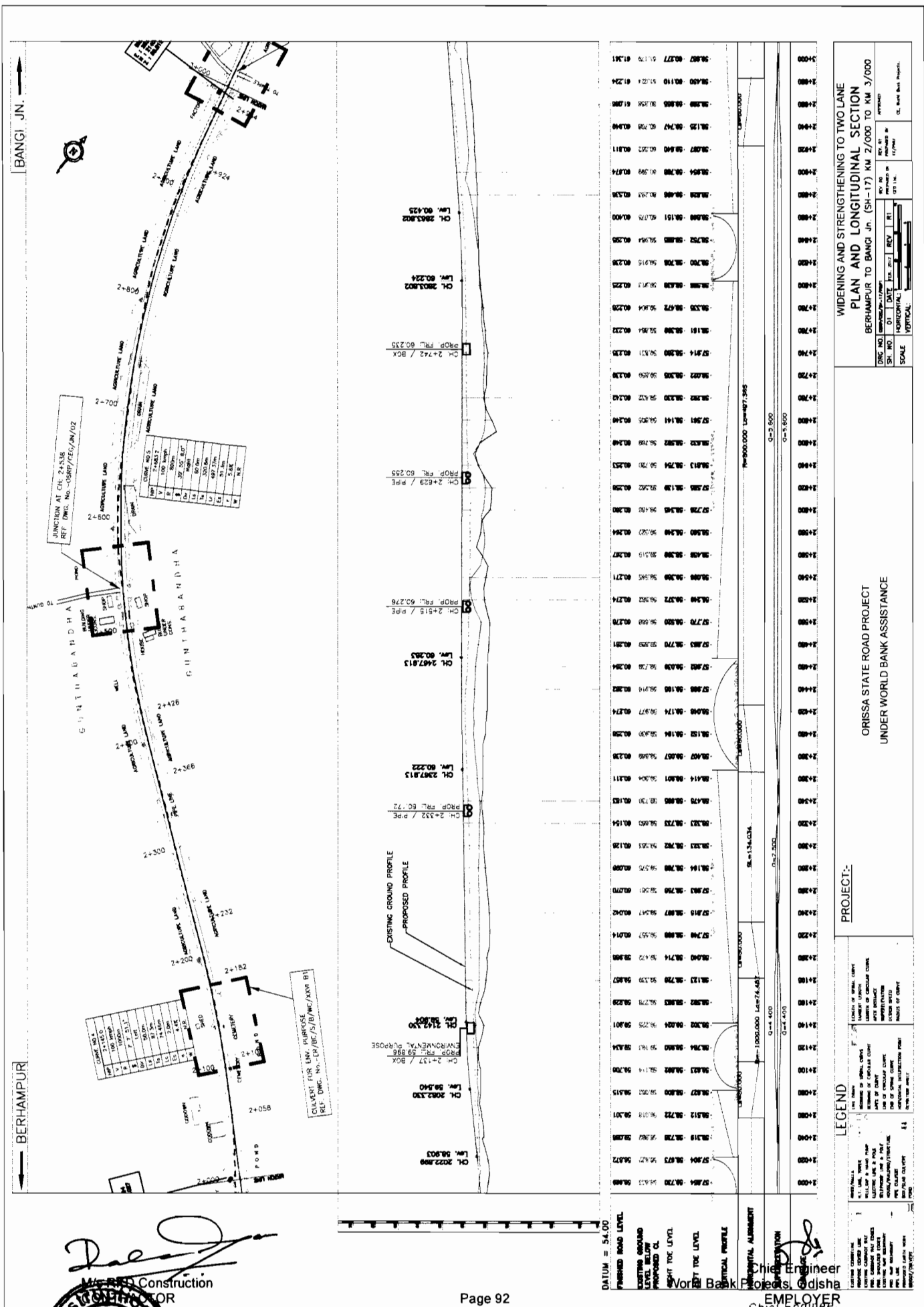
LEGEND

- EXISTING ROAD
- PROPOSED ROAD
- EXISTING GROUND
- PROPOSED CL
- RIGHT LEVEL
- LEFT LEVEL
- VERTICAL CURVE
- EXISTING GROUND
- PROPOSED CL
- RIGHT LEVEL
- LEFT LEVEL
- VERTICAL CURVE

DATE: 10/12/2012
 SCALE: HORIZONTAL: 1/1000, VERTICAL: 1/100

M/s RKD Construction
 CONTRACTOR





Mr. R.R. Construction

 PROJECT MANAGER

Chief Engineer

 Chief Engineer

 World Bank Project

 O/o the Chief Engineer, Odisha

 Bhubaneswar.

WIDENING AND STRENGTHENING TO TWO LANE
 PLAN AND LONGITUDINAL SECTION
 BERMAMPUR TO BANGI Jn. (SH-17) KM 2/000 TO KM 3/000

DRG NO.	DATE	REV.	BY	CHKD.
1	10/11/17	1

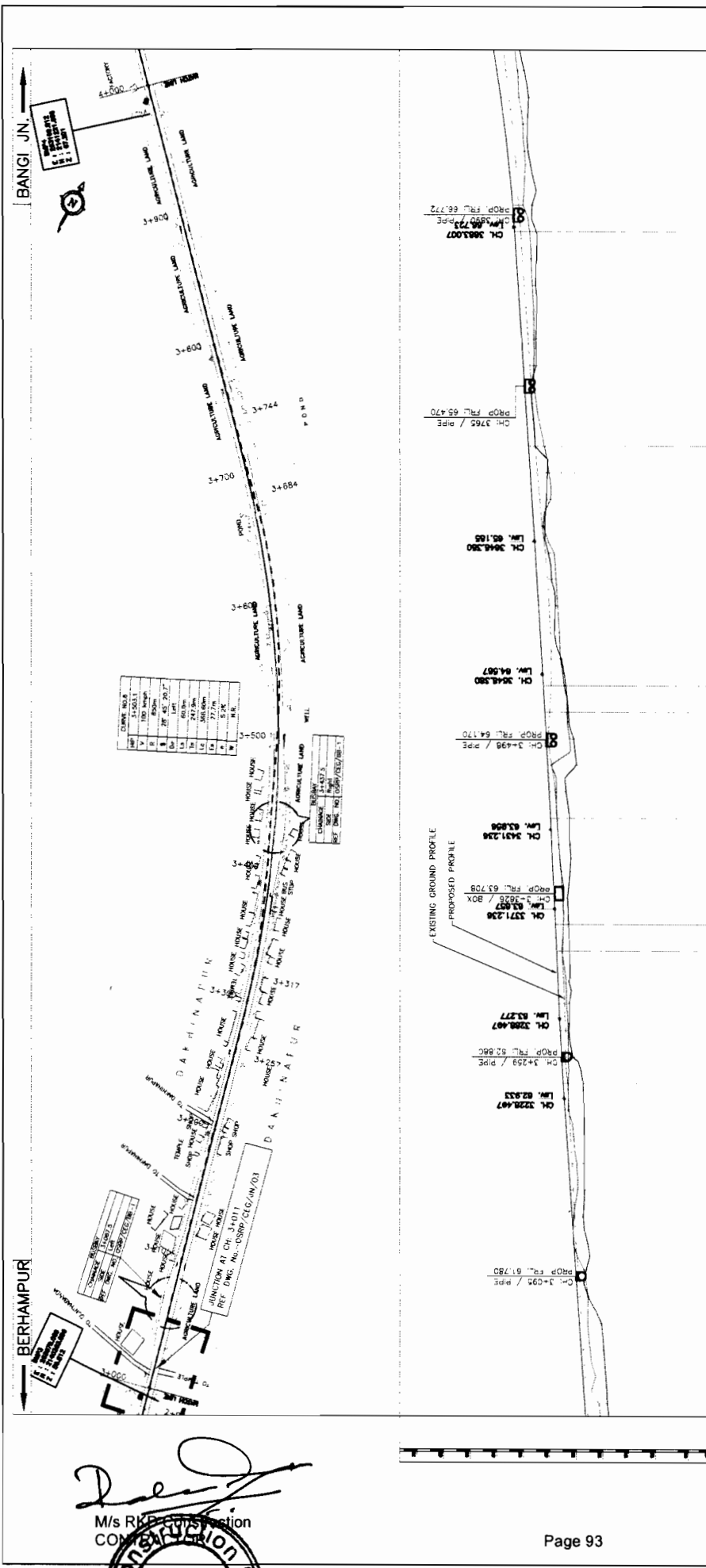
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ORISSA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE

PROJECT:-

LEGEND

...	...
...	...
...	...



STATION	EXISTING GROUND PROFILE	PROPOSED PROFILE	VERTICAL CURVE DATA
0+000	54.00	54.00	
0+100	54.00	54.00	
0+200	54.00	54.00	
0+300	54.00	54.00	
0+400	54.00	54.00	
0+500	54.00	54.00	
0+600	54.00	54.00	
0+700	54.00	54.00	
0+800	54.00	54.00	
0+900	54.00	54.00	
1+000	54.00	54.00	
1+100	54.00	54.00	
1+200	54.00	54.00	
1+300	54.00	54.00	
1+400	54.00	54.00	
1+500	54.00	54.00	
1+600	54.00	54.00	
1+700	54.00	54.00	
1+800	54.00	54.00	
1+900	54.00	54.00	
2+000	54.00	54.00	
2+100	54.00	54.00	
2+200	54.00	54.00	
2+300	54.00	54.00	
2+400	54.00	54.00	
2+500	54.00	54.00	
2+600	54.00	54.00	
2+700	54.00	54.00	
2+800	54.00	54.00	
2+900	54.00	54.00	
3+000	54.00	54.00	
3+100	54.00	54.00	
3+200	54.00	54.00	
3+300	54.00	54.00	
3+400	54.00	54.00	
3+500	54.00	54.00	
3+600	54.00	54.00	
3+700	54.00	54.00	
3+800	54.00	54.00	
3+900	54.00	54.00	
4+000	54.00	54.00	

M/s R.K. Construction
 CONSULTANTS
 Bhubaneswar

Chief Engineer
 Odisha
 O/o the E.I.C. (Civil), Odisha
 Bhubaneswar.

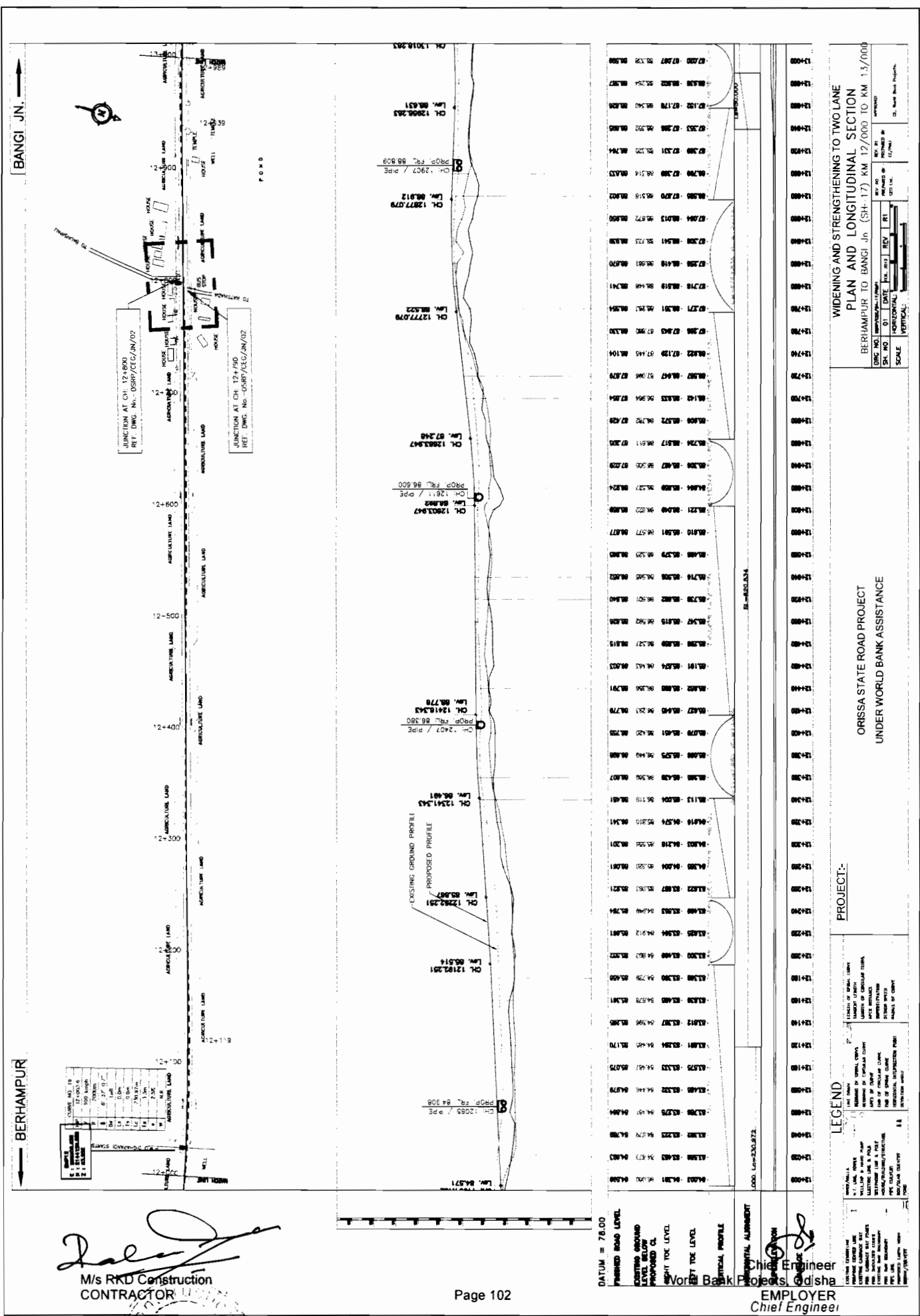
WIDENING AND STRENGTHENING TO TWO LANE
 PLAN AND LONGITUDINAL SECTION
 BERHAMPUR TO BANGI Jn. (SH-17) KM. 3/000 TO KM. 4/000

ORISSA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE

LEGEND

EXISTING GROUND PROFILE
 PROPOSED PROFILE
 PROPOSED PAVEMENT
 PROPOSED SIDEWALK
 PROPOSED DRAINAGE

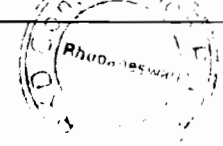
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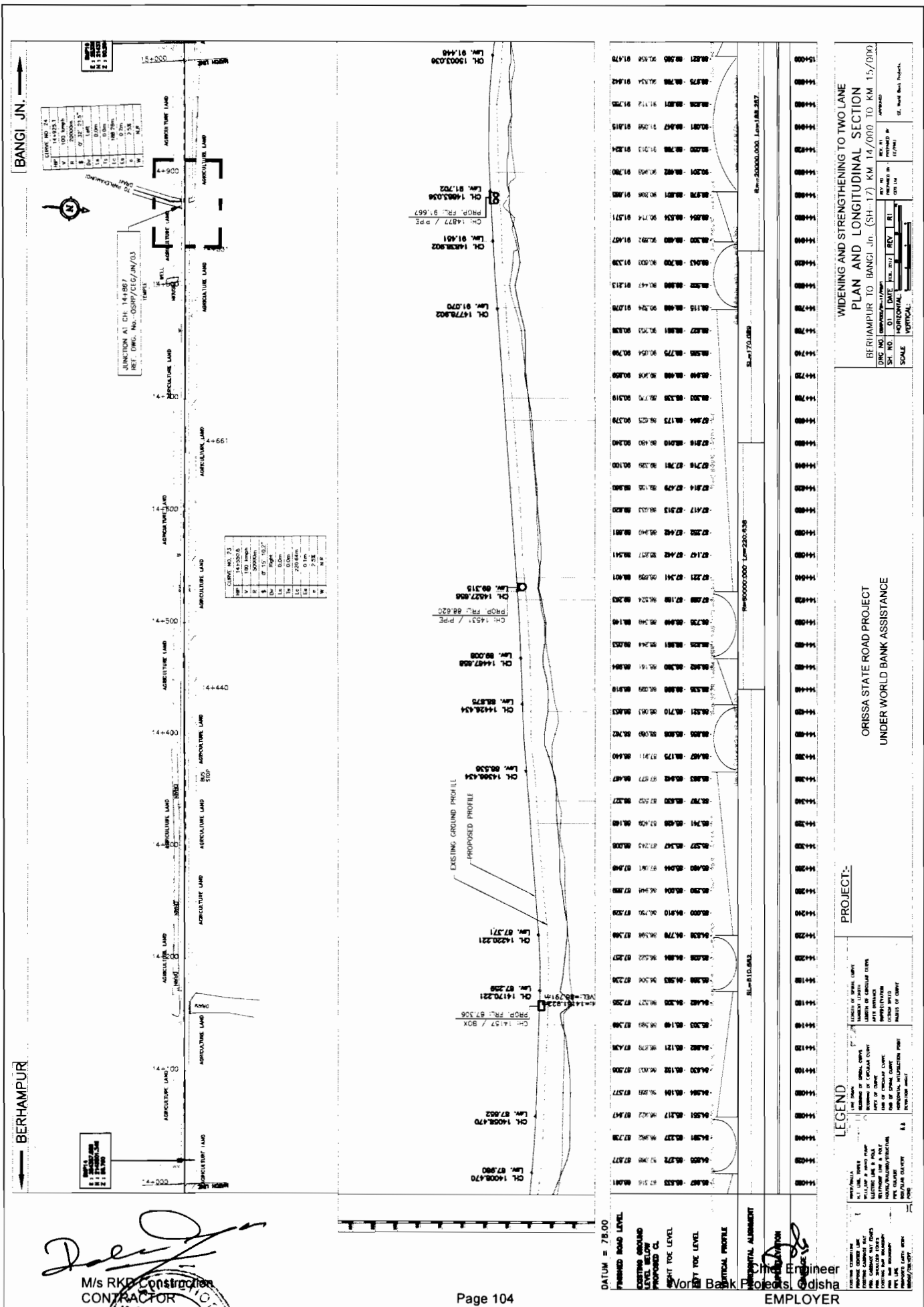


[Signature]
M/s RKD Construction
CONTRACTOR

Chief Engineer
Projects, Odisha

EMPLOYER
Chief Engineer
World Bank Project
O/o the S.C. (Civil), Odisha
Bhubaneswar.





[Signature]
 M/s RKB Construction
 CONTRACTOR

Chief Engineer
 World Bank
 EMPLOYER

Chief Engineer
 Page 31 of 135
 O/o the E.I.C.(Civil), Odisha
 Bhubaneswar.

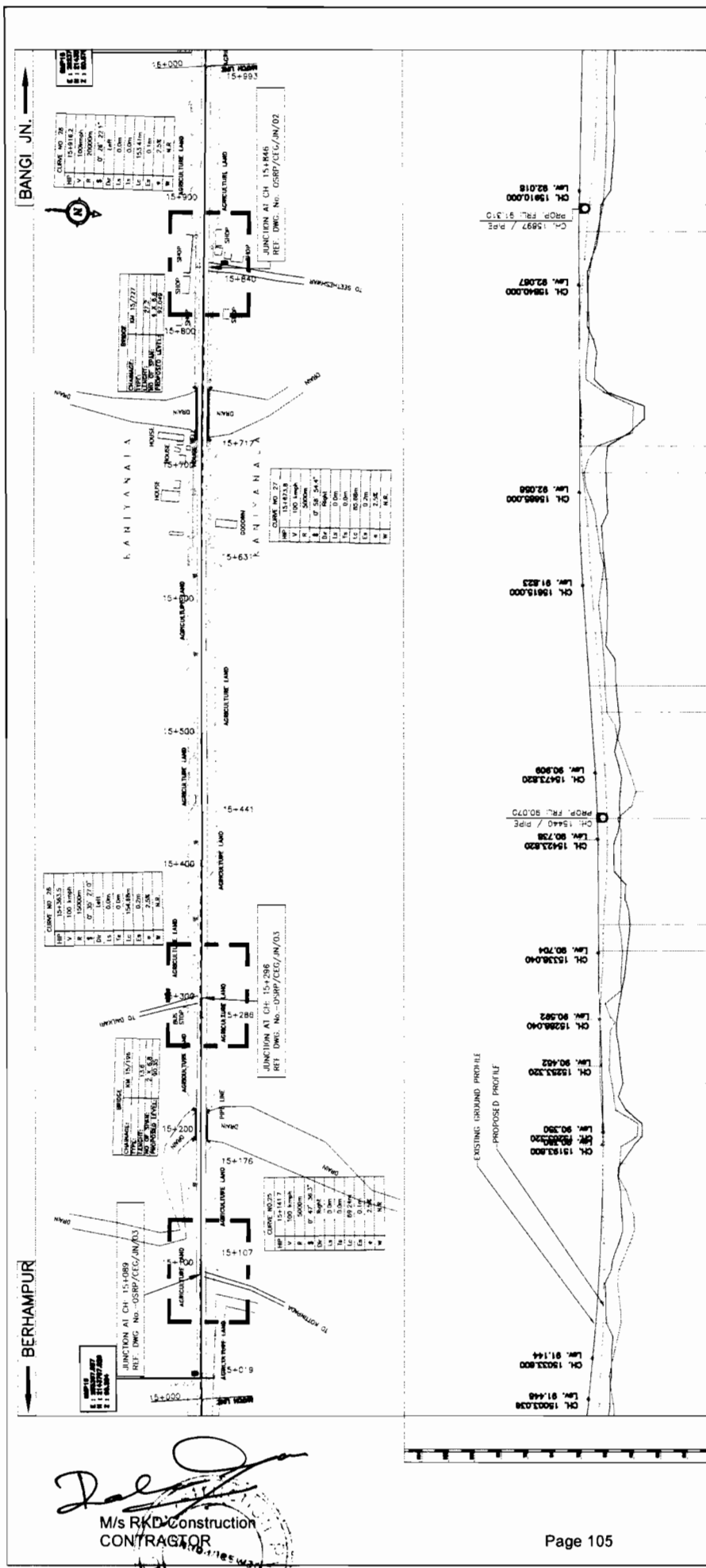
**WIDENING AND STRENGTHENING TO TWO LANE
 PLAN AND LONGITUDINAL SECTION**
 BERHAMPUR TO BANGI Jn. (SH-17) KM 14/000 TO KM 15/000

DATE: 01/01/2017
 SCALE: HORIZONTAL: 1:1000, VERTICAL: 1:100

ORISSA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE

LEGEND

EXISTING GROUND PROFILE
 PROPOSED ROAD PROFILE
 EXISTING ROAD PROFILE
 PROPOSED ROAD PROFILE
 EXISTING ROAD PROFILE
 PROPOSED ROAD PROFILE



STATION	EXISTING GROUND LEVEL	PROPOSED G.L.	RIGHT OF WAY	LEFT OF WAY	VERTICAL CURVE DATA
15+000	80.821	80.888	80.872	81.200	
15+010	80.825	80.898	80.882	81.205	
15+020	80.829	80.908	80.897	81.210	
15+030	80.833	80.918	80.902	81.215	
15+040	80.837	80.928	80.907	81.220	
15+050	80.841	80.938	80.912	81.225	
15+060	80.845	80.948	80.917	81.230	
15+070	80.849	80.958	80.922	81.235	
15+080	80.853	80.968	80.927	81.240	
15+090	80.857	80.978	80.932	81.245	
15+100	80.861	80.988	80.937	81.250	
15+110	80.865	80.998	80.942	81.255	
15+120	80.869	81.008	80.947	81.260	
15+130	80.873	81.018	80.952	81.265	
15+140	80.877	81.028	80.957	81.270	
15+150	80.881	81.038	80.962	81.275	
15+160	80.885	81.048	80.967	81.280	
15+170	80.889	81.058	80.972	81.285	
15+180	80.893	81.068	80.977	81.290	
15+190	80.897	81.078	80.982	81.295	
15+200	80.901	81.088	80.987	81.300	
15+210	80.905	81.098	80.992	81.305	
15+220	80.909	81.108	80.997	81.310	
15+230	80.913	81.118	81.002	81.315	
15+240	80.917	81.128	81.007	81.320	
15+250	80.921	81.138	81.012	81.325	
15+260	80.925	81.148	81.017	81.330	
15+270	80.929	81.158	81.022	81.335	
15+280	80.933	81.168	81.027	81.340	
15+290	80.937	81.178	81.032	81.345	
15+300	80.941	81.188	81.037	81.350	
15+310	80.945	81.198	81.042	81.355	
15+320	80.949	81.208	81.047	81.360	
15+330	80.953	81.218	81.052	81.365	
15+340	80.957	81.228	81.057	81.370	
15+350	80.961	81.238	81.062	81.375	
15+360	80.965	81.248	81.067	81.380	
15+370	80.969	81.258	81.072	81.385	
15+380	80.973	81.268	81.077	81.390	
15+390	80.977	81.278	81.082	81.395	
15+400	80.981	81.288	81.087	81.400	
15+410	80.985	81.298	81.092	81.405	
15+420	80.989	81.308	81.097	81.410	
15+430	80.993	81.318	81.102	81.415	
15+440	80.997	81.328	81.107	81.420	
15+450	80.999	81.338	81.112	81.425	
15+460	81.001	81.348	81.117	81.430	
15+470	81.003	81.358	81.122	81.435	
15+480	81.005	81.368	81.127	81.440	
15+490	81.007	81.378	81.132	81.445	
15+500	81.009	81.388	81.137	81.450	

**WIDENING AND STRENGTHENING TO TWO LANE
PLAN AND LONGITUDINAL SECTION**

BERHAMPUR TO BANGI Jn. (SH-17) KM 15/000 TO KM 16/000

ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

PROJECT:-

LEGEND

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DATE: 12/01/13 BY: [Signature]

PROJECT NO: [Number]

DRAWING NO: [Number]

SHEET NO: [Number]

SCALE: HORIZONTAL 1:1000 VERTICAL 1:100

DATE: 12/01/13 BY: [Signature]

PROJECT NO: [Number]

DRAWING NO: [Number]

SHEET NO: [Number]

M/s RKD Construction CONTRACTOR

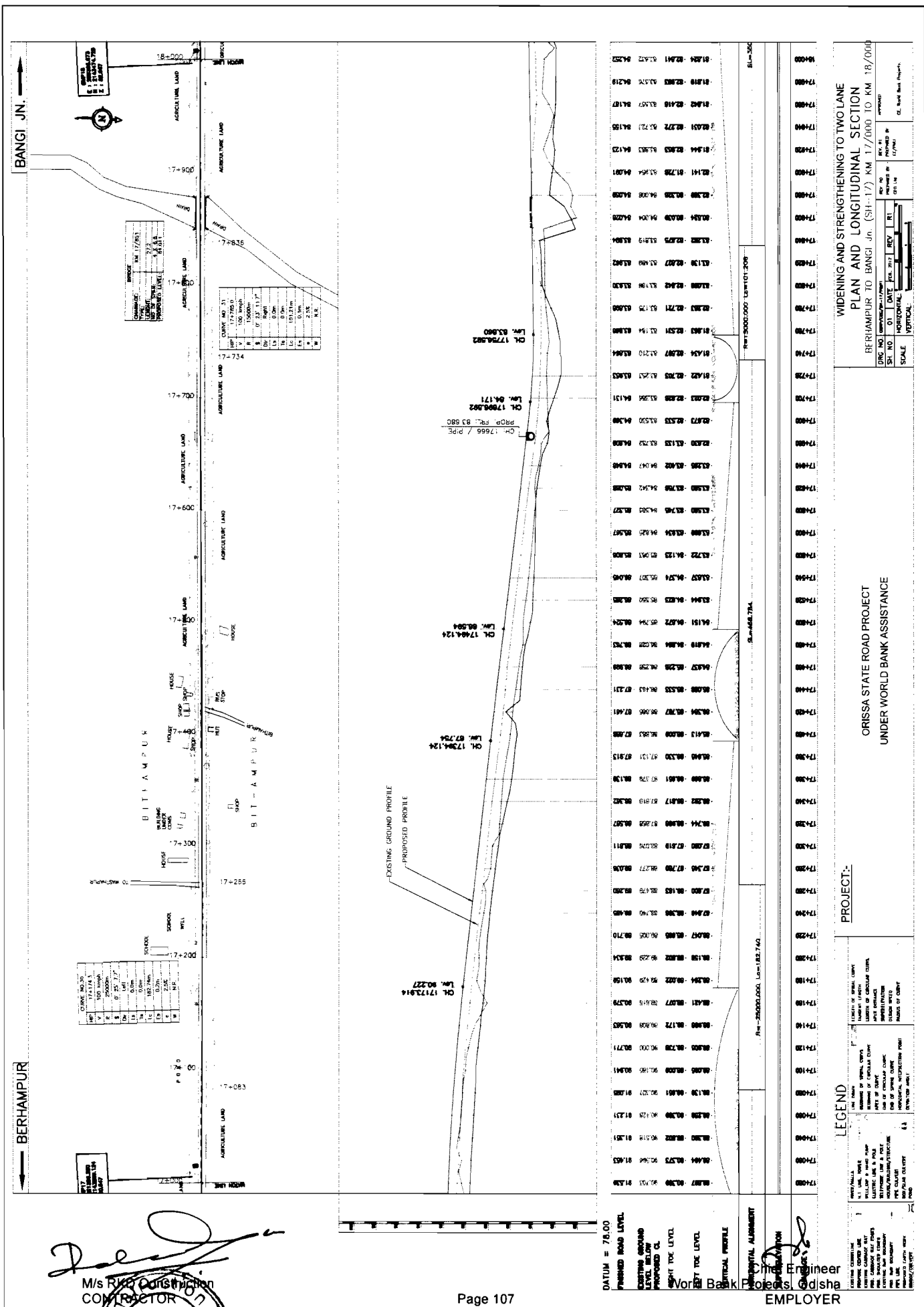
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Page 105

Annexure - II

Chief Engineer
EMPLOYER
 World Bank Project
 O/o the E.C. (E&W), Orissa
 Bhubaneswar.



M/s Rishabh Construction
CONTRACTOR

Rishabh Construction
Bhubaneswar

DATUM = 78.00

PROPOSED ROAD LEVEL

EXISTING GROUND LEVEL

VERTICAL PROFILE

Vertical Alignment

Chief Engineer
Rishabh Construction
Bhubaneswar

EMPLOYER

WIDENING AND STRENGTHENING TO TWO LANE
PLAN AND LONGITUDINAL SECTION
BERHAMPUR TO BANGI Jn. (SH-17) KM 17/000 TO KM 18/000

ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

PROJECT:-

LEGEND

EXISTING GROUND LEVEL

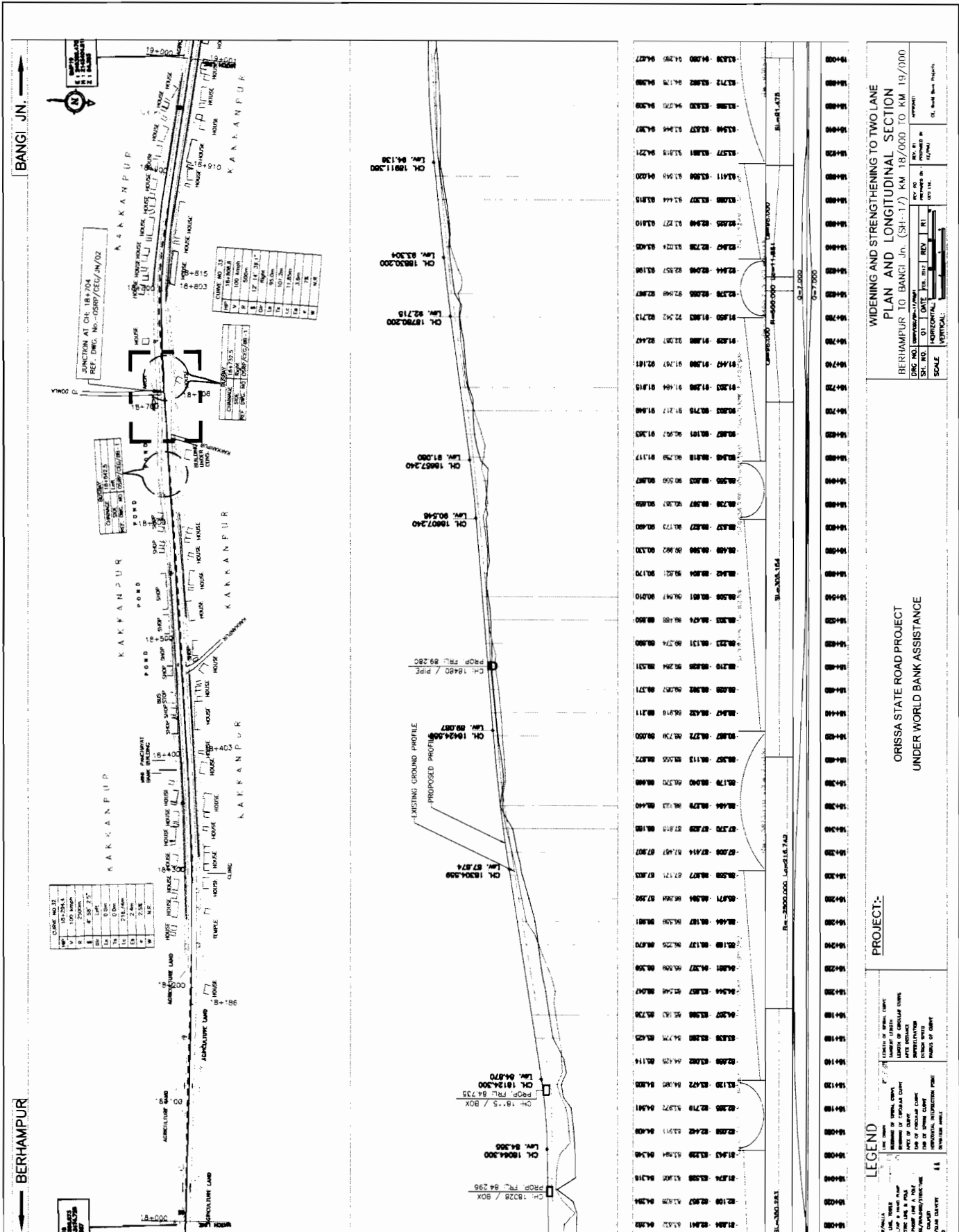
PROPOSED ROAD LEVEL

VERTICAL PROFILE

Vertical Alignment

STATION	PROPOSED ROAD LEVEL	EXISTING GROUND LEVEL	VERTICAL PROFILE
17+000	81.87	81.30	
17+005	81.87	81.30	
17+010	81.87	81.30	
17+015	81.87	81.30	
17+020	81.87	81.30	
17+025	81.87	81.30	
17+030	81.87	81.30	
17+035	81.87	81.30	
17+040	81.87	81.30	
17+045	81.87	81.30	
17+050	81.87	81.30	
17+055	81.87	81.30	
17+060	81.87	81.30	
17+065	81.87	81.30	
17+070	81.87	81.30	
17+075	81.87	81.30	
17+080	81.87	81.30	
17+085	81.87	81.30	
17+090	81.87	81.30	
17+095	81.87	81.30	
18+000	81.87	81.30	

Chief Engineer
World Bank Project
O/o the E.I.C.(Civil), Odisha
Bhubaneswar.



[Signature]
M/s RKD Construction
CONTRACTOR



DATUM = 78.00
FINISHED ROAD LEVEL
EXISTING GROUND LEVEL
PROPOSED CL
RIGHT OF WAY LEVEL
VERTICAL PROFILE

VERTICAL ALIGNMENT
CHIEF ENGINEER
World Bank Projects, Odisha
EMPLOYER

CHIEF ENGINEER
World Bank Projects
O/o the E.I.C. (Civil), Odisha
Bhubaneswar.

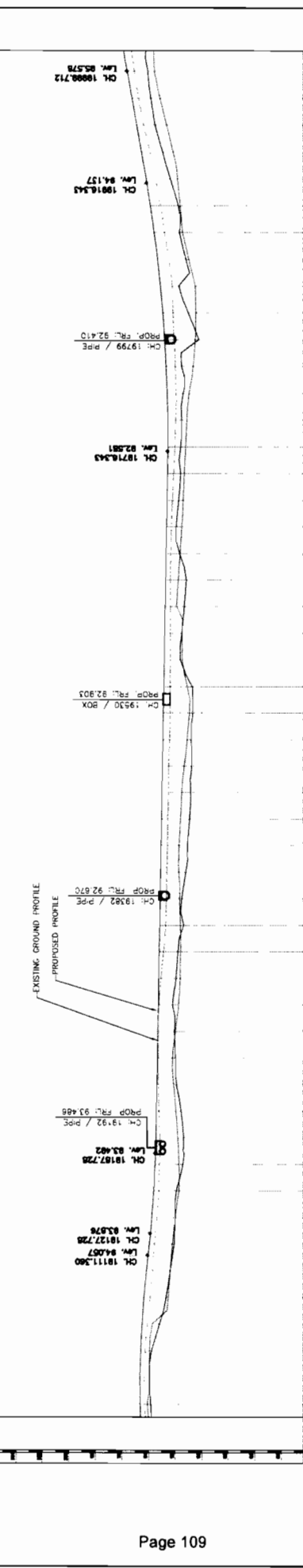
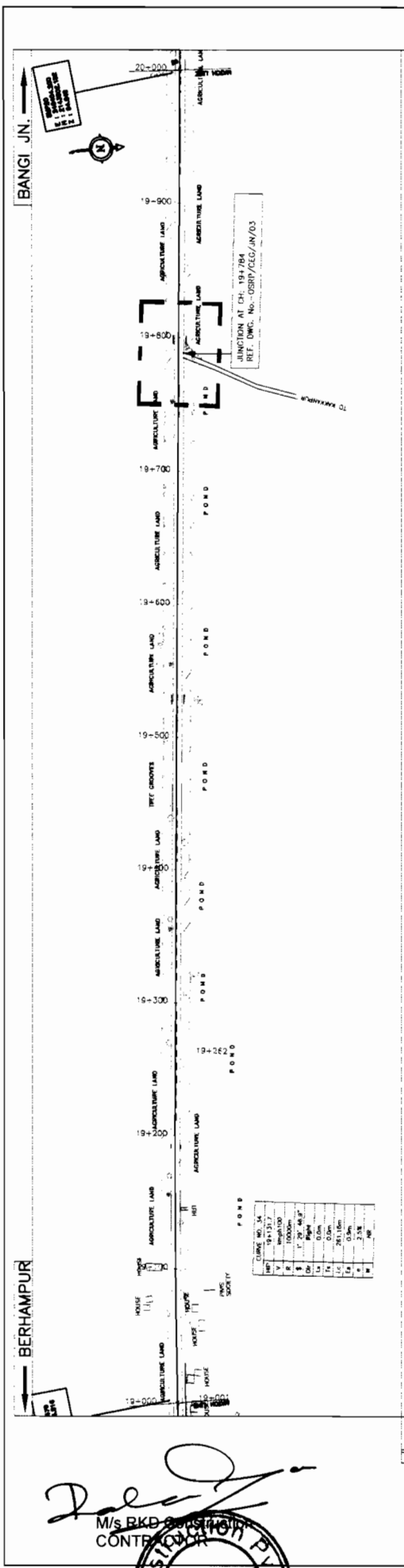
WIDENING AND STRENGTHENING TO TWO LANE
PLAN AND LONGITUDINAL SECTION
BERHAMPUR TO BANGI Jn. (SHP-17) KM 18/000 TO KM 19/000

ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

PROJECT:-
LEGEND
 1. FINISHED ROAD LEVEL
 2. EXISTING GROUND LEVEL
 3. PROPOSED CL
 4. RIGHT OF WAY LEVEL
 5. VERTICAL PROFILE
 6. CHIEF ENGINEER
 7. WORLD BANK PROJECTS, ODISHA
 8. EMPLOYER

SR. NO.	DATE	REV.	BY	CHK. BY	REMARKS

SCALE
 HORIZONTAL: 1:1000
 VERTICAL: 1:100



DATUM = 78.00

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18449.340	LM. 79.230	18535.340	LM. 79.230
18529.740	LM. 77.780	18626.140	LM. 78.000
18609.540	LM. 76.810	18716.940	LM. 76.810
18699.340	LM. 75.320	18807.340	LM. 75.320
18779.140	LM. 74.350	18897.740	LM. 74.350
18858.940	LM. 73.880	18988.140	LM. 73.880
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19417.540	LM. 70.590	19620.940	LM. 70.590
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19577.140	LM. 69.650	19801.740	LM. 69.650
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20295.340	LM. 65.420	20615.340	LM. 65.420
20375.140	LM. 64.950	20705.740	LM. 64.950
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**WIDENING AND STRENGTHENING TO TWO LANE
PLAN AND LONGITUDINAL SECTION
BERHAMPUR TO BANGI Jn. (SH-17) KM 19/000 TO KM 20/000**

ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

PROJECT:-

LEGEND

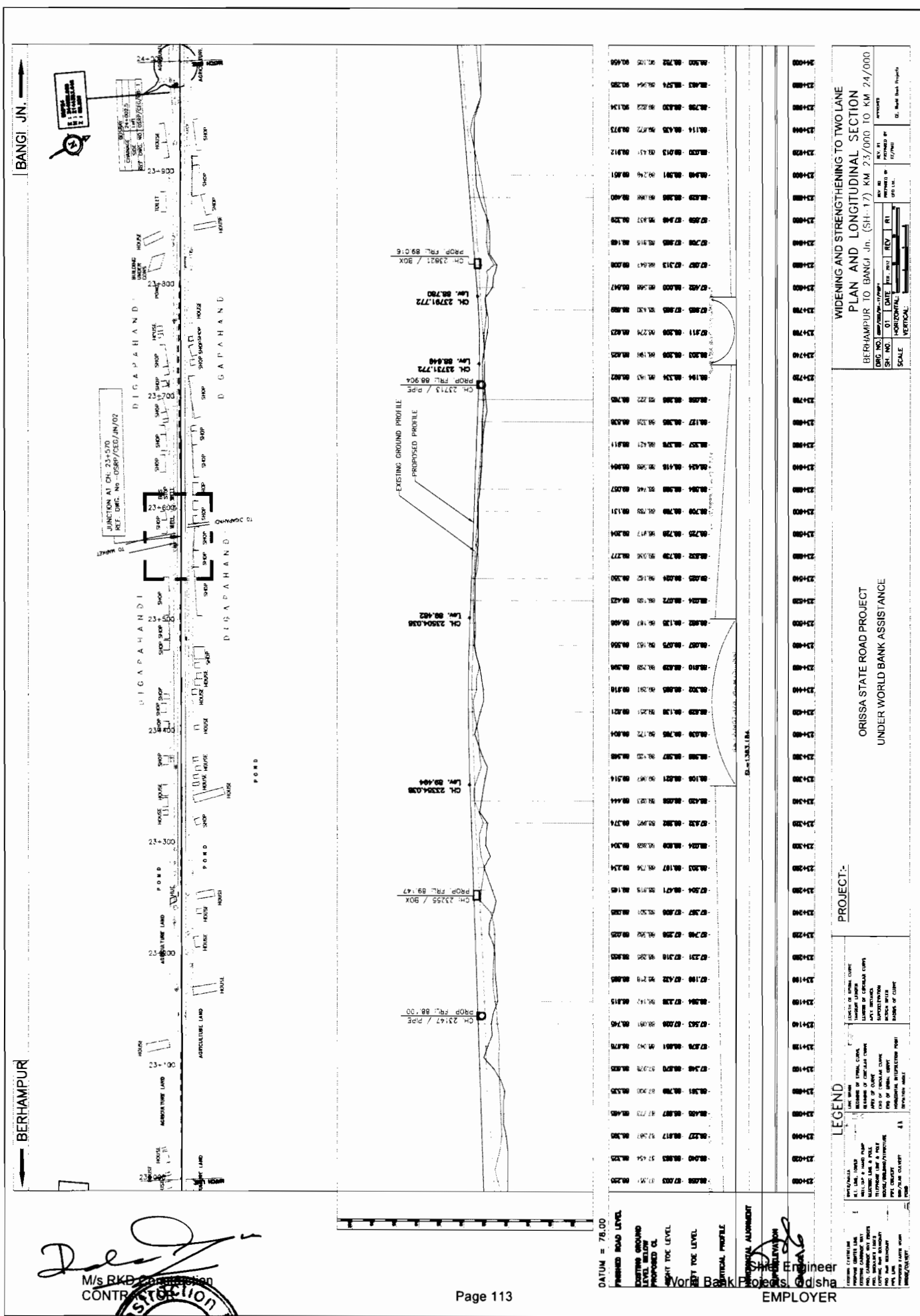
SCALE
HORIZONTAL: 1" = 100' (1:3048)
VERTICAL: 1" = 20' (1:609.6)

DATE: 15/01/2011
BY: [Signature]
CHECKED BY: [Signature]
SCALE: 1:1000

M/s BKD CONSULTANTS
CONTRACTOR

Chief Engineer
Orissa State Road Project
Bhubaneswar

Page 109
Annexure - II



M/s RKB Construction

 CONTRACTOR

Chief Engineer

 World Bank Project

 Odisha

 EMPLOYER

Chief Engineer

 World Bank Project

 O/o the E.I.C.(Civil), Odisha

 Bhubaneswar.

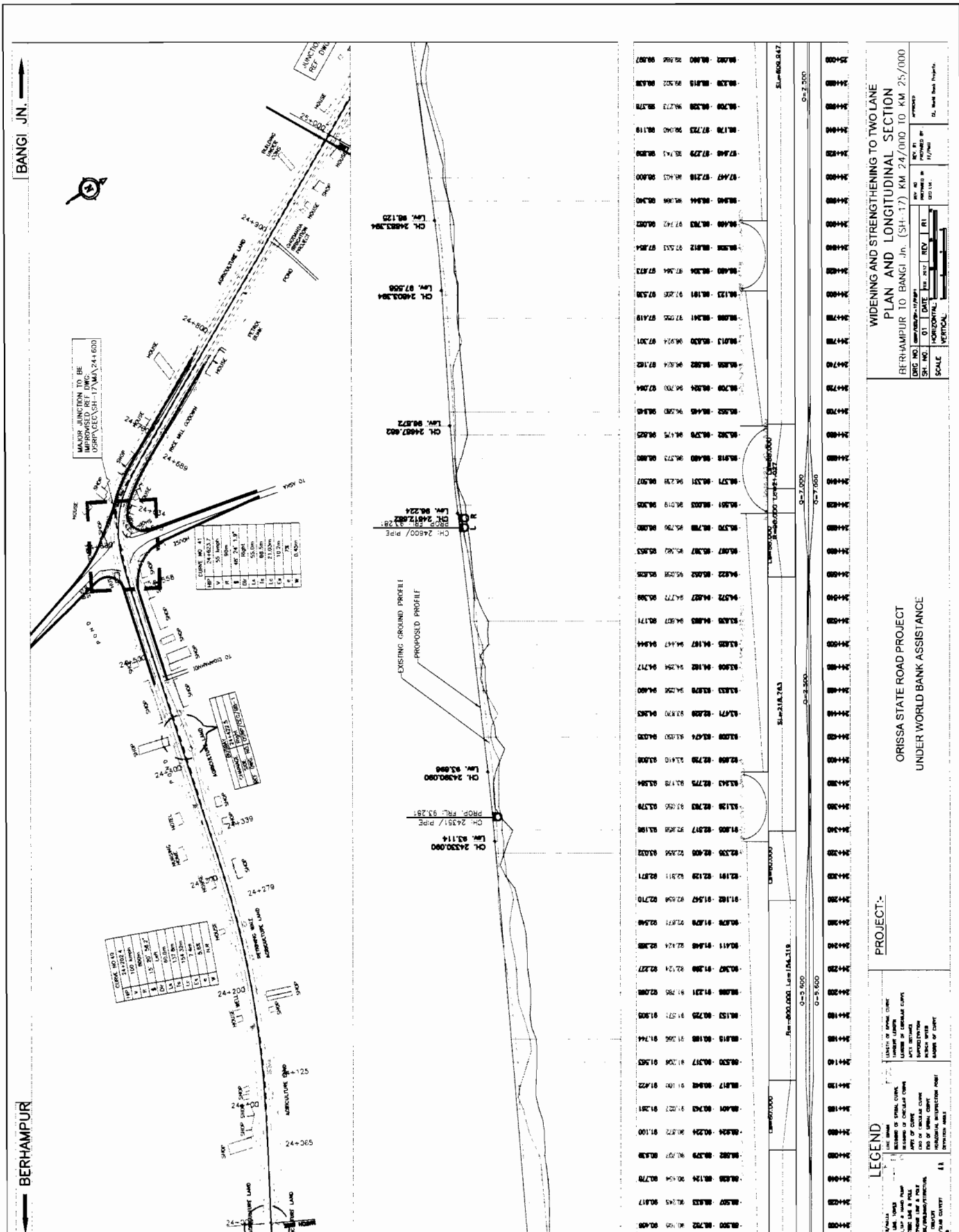
LEGEND

PROPOSED ROAD	EXISTING ROAD	CUTTING	FILLING
PROPOSED SIDEWALK	EXISTING SIDEWALK	PROPOSED DRAINAGE	EXISTING DRAINAGE
PROPOSED UTILITY	EXISTING UTILITY	PROPOSED STRUCTURE	EXISTING STRUCTURE
PROPOSED FENCE	EXISTING FENCE	PROPOSED SIGNAGE	EXISTING SIGNAGE
PROPOSED LANDSCAPE	EXISTING LANDSCAPE	PROPOSED ILLUMINATION	EXISTING ILLUMINATION

PROJECT:-
 ORISSA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE

**WIDENING AND STRENGTHENING TO TWO LANE
 PLAN AND LONGITUDINAL SECTION
 BERHAMPUR TO BANGI JN. (SH-17) KM 23/000 TO KM 24/000**

DRAWN BY: [Name]
 CHECKED BY: [Name]
 APPROVED BY: [Name]
 DATE: [Date]
 SCALE: [Scale]



M/s. BKD Construction
CONTRACTOR



Chief Engineer
World Bank Project, Odisha
EMPLOYER

Chief Engineer
Page 4 of 135
World Bank Project
O/o the E.I.C. (Civil), Odisha
Bhubaneswar

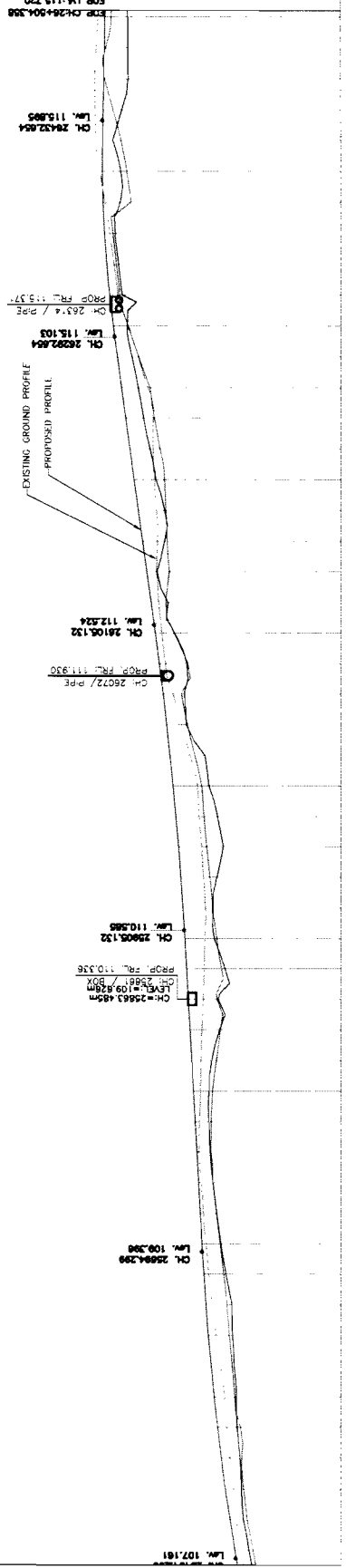
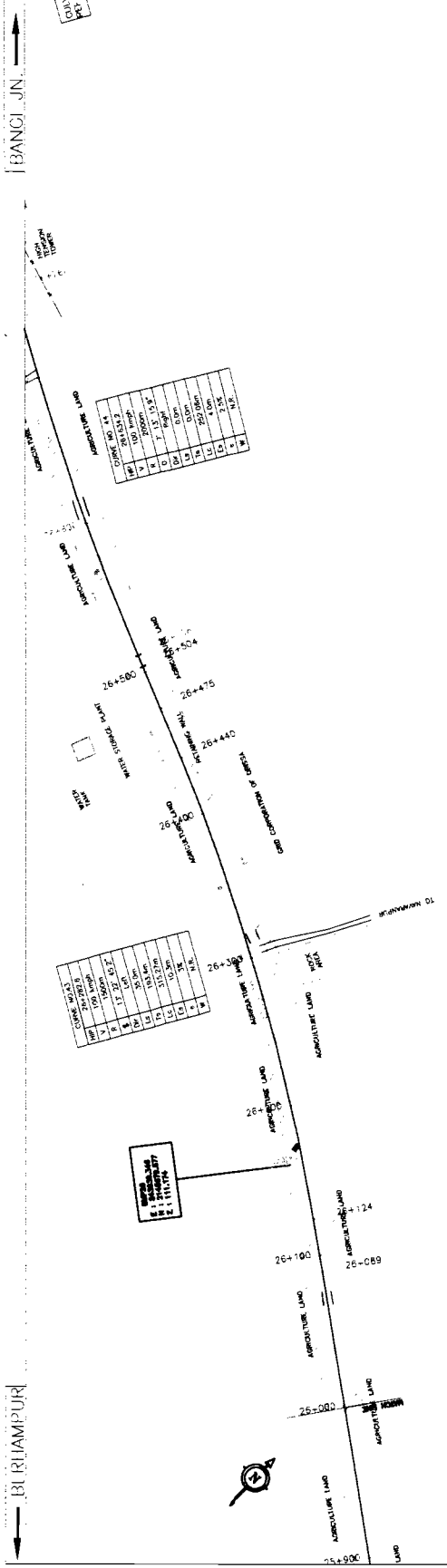
WIDENING AND STRENGTHENING TO TWO LANE
PLAN AND LONGITUDINAL SECTION
BERHAMPUR TO BANGI Jn. (SH-17) KM 24/000 TO KM 25/000

ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

LEGEND

- EXISTING PROFILE
- PROPOSED PROFILE
- EXISTING GROUND LEVEL
- PROPOSED ROAD LEVEL
- EXISTING GROUND LEVEL BELOW PROPOSED G.L.
- RIGHT OF WAY LEVEL
- VERTICAL ALIGNMENT
- ESSENTIAL ALIGNMENT

Station	Existing Ground Level (m)	Proposed Road Level (m)	Right of Way Level (m)
24+000	81.408	81.702	81.702
24+020	81.507	81.833	81.833
24+040	81.579	81.924	81.924
24+060	81.624	82.024	82.024
24+080	81.648	82.072	82.072
24+100	81.656	82.084	82.084
24+120	81.648	82.072	82.072
24+140	81.624	82.024	82.024
24+160	81.579	81.924	81.924
24+180	81.507	81.833	81.833
24+200	81.408	81.702	81.702
24+220	81.274	81.527	81.527
24+240	81.108	81.278	81.278
24+260	80.924	81.024	81.024
24+280	80.728	80.778	80.778
24+300	80.524	80.524	80.524
24+320	80.314	80.314	80.314
24+340	80.108	80.108	80.108
24+360	79.908	79.908	79.908
24+380	79.708	79.708	79.708
24+400	79.508	79.508	79.508
24+420	79.308	79.308	79.308
24+440	79.108	79.108	79.108
24+460	78.908	78.908	78.908
24+480	78.708	78.708	78.708
24+500	78.508	78.508	78.508



STATION	EXISTING GROUND LEVEL	PROPOSED CL	RIGHT TOE LEVEL	LEFT TOE LEVEL	VERTICAL PROFILE
25+900	107.254	107.254	107.254	107.254	
25+920	107.572	107.572	107.572	107.572	
25+940	107.528	107.528	107.528	107.528	
25+960	107.580	107.580	107.580	107.580	
25+980	107.530	107.530	107.530	107.530	
26+000	107.580	107.580	107.580	107.580	
26+020	107.530	107.530	107.530	107.530	
26+040	107.580	107.580	107.580	107.580	
26+060	107.530	107.530	107.530	107.530	
26+080	107.580	107.580	107.580	107.580	
26+100	107.530	107.530	107.530	107.530	
26+120	107.580	107.580	107.580	107.580	
26+140	107.530	107.530	107.530	107.530	
26+160	107.580	107.580	107.580	107.580	
26+180	107.530	107.530	107.530	107.530	
26+200	107.580	107.580	107.580	107.580	
26+220	107.530	107.530	107.530	107.530	
26+240	107.580	107.580	107.580	107.580	
26+260	107.530	107.530	107.530	107.530	
26+280	107.580	107.580	107.580	107.580	
26+300	107.530	107.530	107.530	107.530	
26+320	107.580	107.580	107.580	107.580	
26+340	107.530	107.530	107.530	107.530	
26+360	107.580	107.580	107.580	107.580	
26+380	107.530	107.530	107.530	107.530	
26+400	107.580	107.580	107.580	107.580	
26+420	107.530	107.530	107.530	107.530	
26+440	107.580	107.580	107.580	107.580	
26+460	107.530	107.530	107.530	107.530	
26+480	107.580	107.580	107.580	107.580	
26+500	107.530	107.530	107.530	107.530	

PROJECT:
 WIDENING AND STRENGTHENING TO TWO LANE
 PLAN AND LONGITUDINAL SECTION
 BURIAMPUR TO BANGLI JN. (SH-17) KM 26/000 TO KM 26/500

**ORISSA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE**

LEGEND:

- 1. EXISTING GROUND PROFILE
- 2. PROPOSED CL
- 3. RIGHT TOE LEVEL
- 4. LEFT TOE LEVEL
- 5. VERTICAL PROFILE
- 6. CENTRAL ALIGNMENT
- 7. ROAD WIDTH
- 8. ROAD CROSS SECTION
- 9. ROAD GRADE
- 10. ROAD SURFACE
- 11. ROAD DRAINAGE
- 12. ROAD LIGHTING
- 13. ROAD SIGNAGE
- 14. ROAD SAFETY
- 15. ROAD MAINTENANCE
- 16. ROAD REPAIRS
- 17. ROAD CONSTRUCTION
- 18. ROAD OPERATION
- 19. ROAD MANAGEMENT
- 20. ROAD DEVELOPMENT

SCALE:
 HORIZONTAL: 1:1000
 VERTICAL: 1:100

DATE: 11/11/11

PROJECT NO: 11/11/11

SCALE: 1:1000 (HORIZONTAL), 1:100 (VERTICAL)

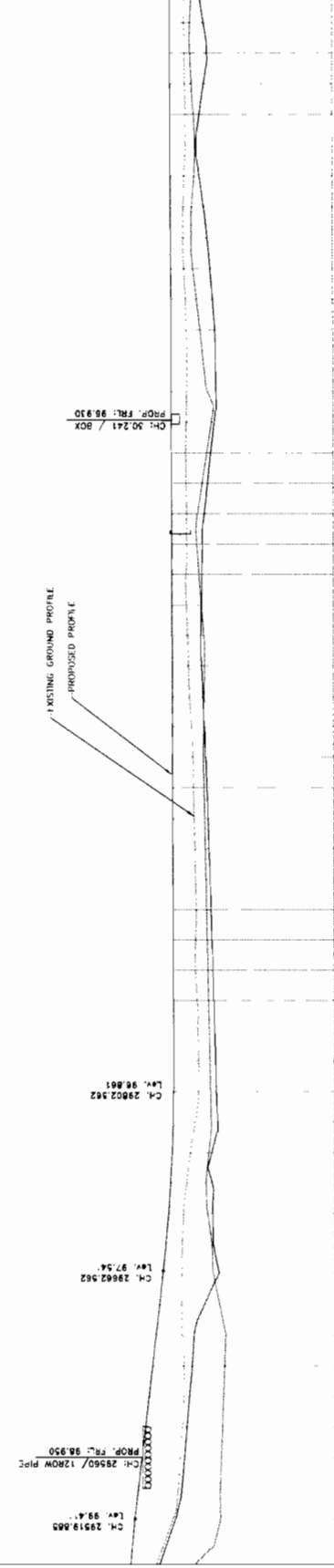
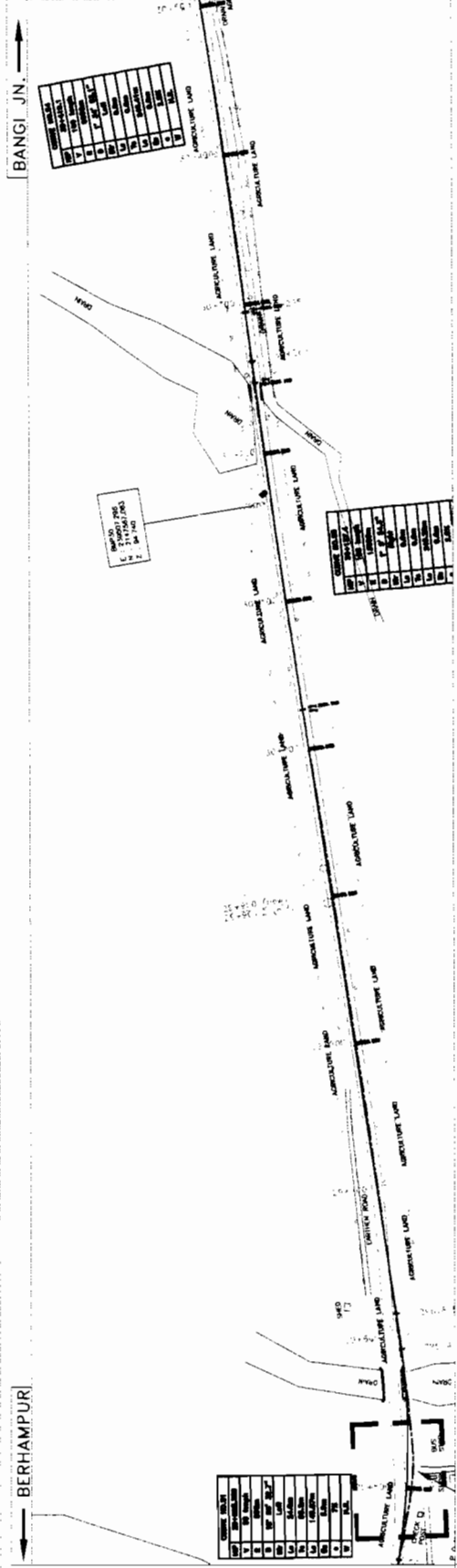
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PROJECT NO: 11/11/11

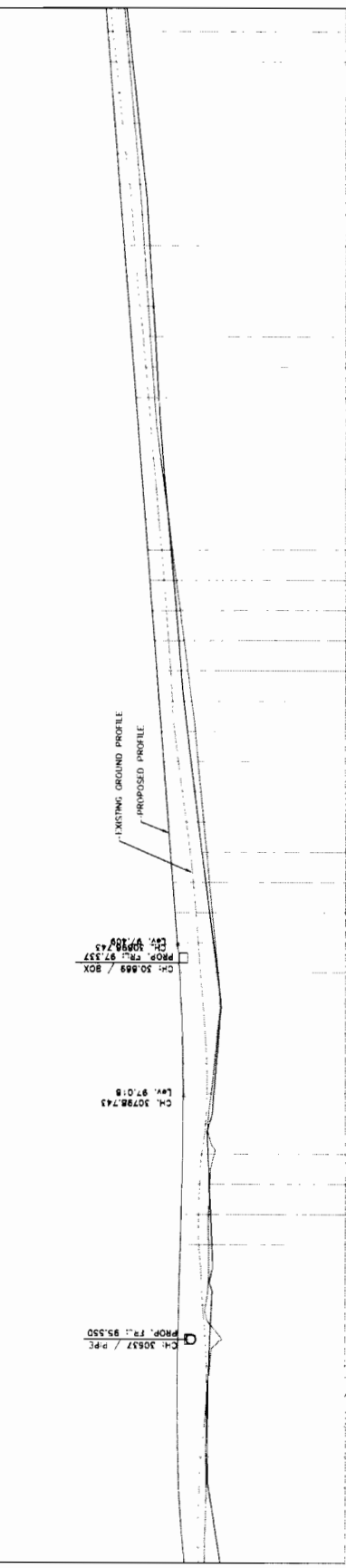
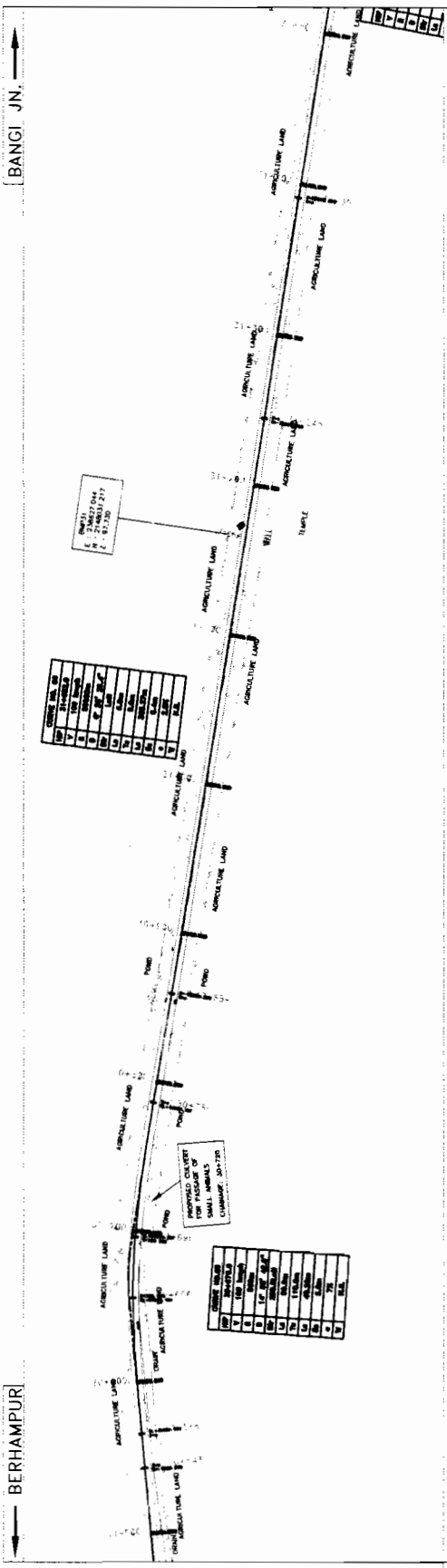
Dated

M/s RKD
 CONSULTANTS

RKD CONSULTANTS



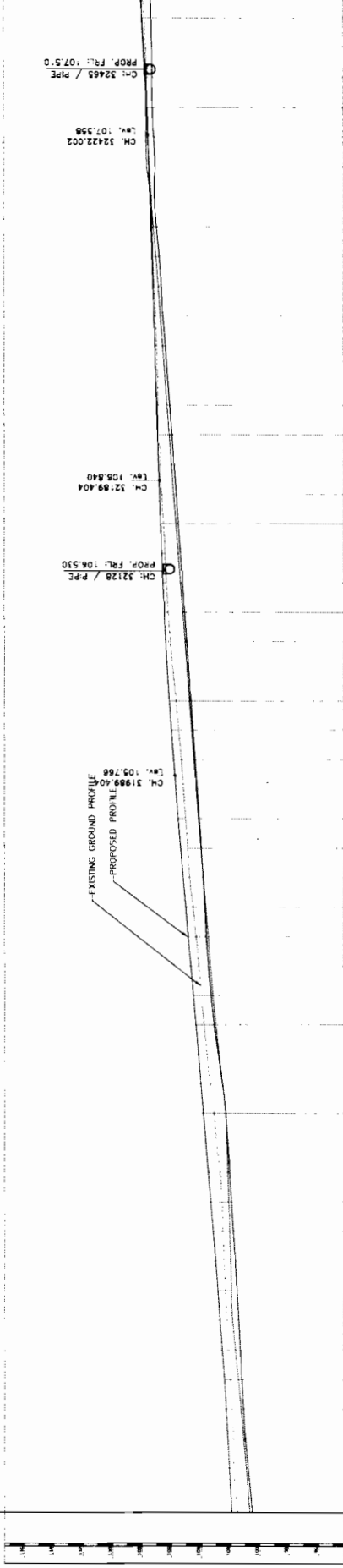
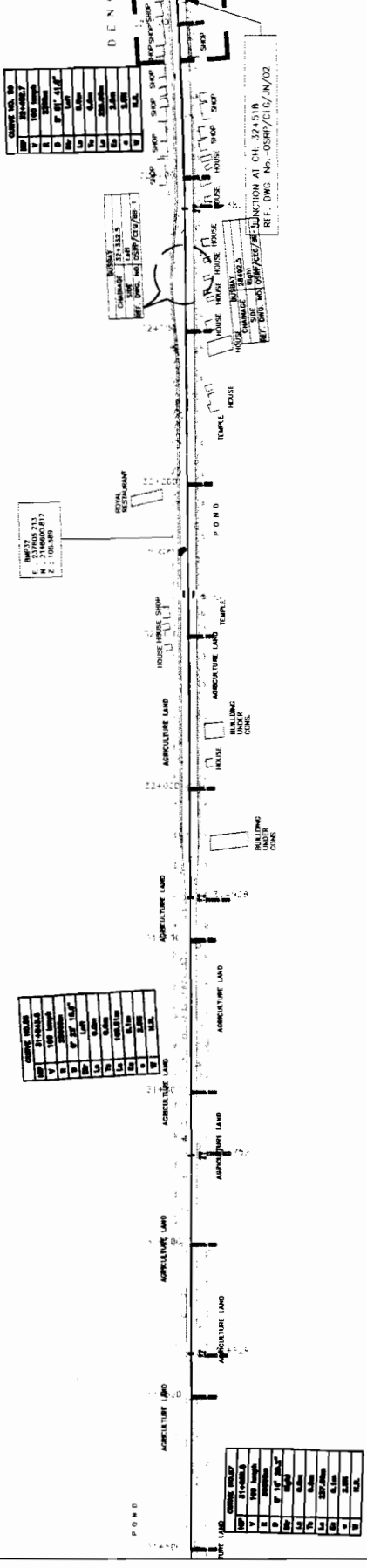
DATUM	90+00	89+80	89+60	89+40	89+20	89+00	88+80	88+60	88+40	88+20	88+00	87+80	87+60	87+40	87+20	87+00	86+80	86+60	86+40	86+20	86+00	85+80	85+60	85+40	85+20	85+00	84+80	84+60	84+40	84+20	84+00	83+80	83+60	83+40	83+20	83+00	82+80	82+60	82+40	82+20	82+00	81+80	81+60	81+40	81+20	81+00	80+80	80+60	80+40	80+20	80+00	79+80	79+60	79+40	79+20	79+00	78+80	78+60	78+40	78+20	78+00	77+80	77+60	77+40	77+20	77+00	76+80	76+60	76+40	76+20	76+00	75+80	75+60	75+40	75+20	75+00	74+80	74+60	74+40	74+20	74+00	73+80	73+60	73+40	73+20	73+00	72+80	72+60	72+40	72+20	72+00	71+80	71+60	71+40	71+20	71+00	70+80	70+60	70+40	70+20	70+00	69+80	69+60	69+40	69+20	69+00	68+80	68+60	68+40	68+20	68+00	67+80	67+60	67+40	67+20	67+00	66+80	66+60	66+40	66+20	66+00	65+80	65+60	65+40	65+20	65+00	64+80	64+60	64+40	64+20	64+00	63+80	63+60	63+40	63+20	63+00	62+80	62+60	62+40	62+20	62+00	61+80	61+60	61+40	61+20	61+00	60+80	60+60	60+40	60+20	60+00	59+80	59+60	59+40	59+20	59+00	58+80	58+60	58+40	58+20	58+00	57+80	57+60	57+40	57+20	57+00	56+80	56+60	56+40	56+20	56+00	55+80	55+60	55+40	55+20	55+00	54+80	54+60	54+40	54+20	54+00	53+80	53+60	53+40	53+20	53+00	52+80	52+60	52+40	52+20	52+00	51+80	51+60	51+40	51+20	51+00	50+80	50+60	50+40	50+20	50+00	49+80	49+60	49+40	49+20	49+00	48+80	48+60	48+40	48+20	48+00	47+80	47+60	47+40	47+20	47+00	46+80	46+60	46+40	46+20	46+00	45+80	45+60	45+40	45+20	45+00	44+80	44+60	44+40	44+20	44+00	43+80	43+60	43+40	43+20	43+00	42+80	42+60	42+40	42+20	42+00	41+80	41+60	41+40	41+20	41+00	40+80	40+60	40+40	40+20	40+00	39+80	39+60	39+40	39+20	39+00	38+80	38+60	38+40	38+20	38+00	37+80	37+60	37+40	37+20	37+00	36+80	36+60	36+40	36+20	36+00	35+80	35+60	35+40	35+20	35+00	34+80	34+60	34+40	34+20	34+00	33+80	33+60	33+40	33+20	33+00	32+80	32+60	32+40	32+20	32+00	31+80	31+60	31+40	31+20	31+00	30+80	30+60	30+40	30+20	30+00																																																																																																																																																																																																																																																																																																																																																																																																																																																		
FINISHED ROAD LEVEL	95.435	95.429	95.423	95.417	95.411	95.405	95.399	95.393	95.387	95.381	95.375	95.369	95.363	95.357	95.351	95.345	95.339	95.333	95.327	95.321	95.315	95.309	95.303	95.297	95.291	95.285	95.279	95.273	95.267	95.261	95.255	95.249	95.243	95.237	95.231	95.225	95.219	95.213	95.207	95.201	95.195	95.189	95.183	95.177	95.171	95.165	95.159	95.153	95.147	95.141	95.135	95.129	95.123	95.117	95.111	95.105	95.099	95.093	95.087	95.081	95.075	95.069	95.063	95.057	95.051	95.045	95.039	95.033	95.027	95.021	95.015	95.009	95.003	94.997	94.991	94.985	94.979	94.973	94.967	94.961	94.955	94.949	94.943	94.937	94.931	94.925	94.919	94.913	94.907	94.901	94.895	94.889	94.883	94.877	94.871	94.865	94.859	94.853	94.847	94.841	94.835	94.829	94.823	94.817	94.811	94.805	94.799	94.793	94.787	94.781	94.775	94.769	94.763	94.757	94.751	94.745	94.739	94.733	94.727	94.721	94.715	94.709	94.703	94.697	94.691	94.685	94.679	94.673	94.667	94.661	94.655	94.649	94.643	94.637	94.631	94.625	94.619	94.613	94.607	94.601	94.595	94.589	94.583	94.577	94.571	94.565	94.559	94.553	94.547	94.541	94.535	94.529	94.523	94.517	94.511	94.505	94.499	94.493	94.487	94.481	94.475	94.469	94.463	94.457	94.451	94.445	94.439	94.433	94.427	94.421	94.415	94.409	94.403	94.397	94.391	94.385	94.379	94.373	94.367	94.361	94.355	94.349	94.343	94.337	94.331	94.325	94.319	94.313	94.307	94.301	94.295	94.289	94.283	94.277	94.271	94.265	94.259	94.253	94.247	94.241	94.235	94.229	94.223	94.217	94.211	94.205	94.199	94.193	94.187	94.181	94.175	94.169	94.163	94.157	94.151	94.145	94.139	94.133	94.127	94.121	94.115	94.109	94.103	94.097	94.091	94.085	94.079	94.073	94.067	94.061	94.055	94.049	94.043	94.037	94.031	94.025	94.019	94.013	94.007	94.001	93.995	93.989	93.983	93.977	93.971	93.965	93.959	93.953	93.947	93.941	93.935	93.929	93.923	93.917	93.911	93.905	93.899	93.893	93.887	93.881	93.875	93.869	93.863	93.857	93.851	93.845	93.839	93.833	93.827	93.821	93.815	93.809	93.803	93.797	93.791	93.785	93.779	93.773	93.767	93.761	93.755	93.749	93.743	93.737	93.731	93.725	93.719	93.713	93.707	93.701	93.695	93.689	93.683	93.677	93.671	93.665	93.659	93.653	93.647	93.641	93.635	93.629	93.623	93.617	93.611	93.605	93.599	93.593	93.587	93.581	93.575	93.569	93.563	93.557	93.551	93.545	93.539	93.533	93.527	93.521	93.515	93.509	93.503	93.497	93.491	93.485	93.479	93.473	93.467	93.461	93.455	93.449	93.443	93.437	93.431	93.425	93.419	93.413	93.407	93.401	93.395	93.389	93.383	93.377	93.371	93.365	93.359	93.353	93.347	93.341	93.335	93.329	93.323	93.317	93.311	93.305	93.299	93.293	93.287	93.281	93.275	93.269	93.263	93.257	93.251	93.245	93.239	93.233	93.227	93.221	93.215	93.209	93.203	93.197	93.191	93.185	93.179	93.173	93.167	93.161	93.155	93.149	93.143	93.137	93.131	93.125	93.119	93.113	93.107	93.101	93.095	93.089	93.083	93.077	93.071	93.065	93.059	93.053	93.047	93.041	93.035	93.029	93.023	93.017	93.011	93.005	92.999	92.993	92.987	92.981	92.975	92.969	92.963	92.957	92.951	92.945	92.939	92.933	92.927	92.921	92.915	92.909	92.903	92.897	92.891	92.885	92.879	92.873	92.867	92.861	92.855	92.849	92.843	92.837	92.831	92.825	92.819	92.813	92.807	92.801	92.795	92.789	92.783	92.777	92.771	92.765	92.759	92.753	92.747	92.741	92.735	92.729	92.723	92.717	92.711	92.705	92.699	92.693	92.687	92.681	92.675	92.669	92.663	92.657	92.651	92.645	92.639	92.633	92.627	92.621	92.615	92.609	92.603	92.597	92.591	92.585	92.579	92.573	92.567	92.561	92.555	92.549	92.543	92.537	92.531	92.525	92.519	92.513	92.507	92.501	92.495	92.489	92.483	92.477	92.471	92.465	92.459	92.453	92.447	92.441	92.435	92.429	92.423	92.417	92.411	92.405	92.399	92.393	92.387	92.381	92.375	92.369	92.363	92.357	92.351	92.345	92.339	92.333	92.327	92.321	92.315	92.309	92.303	92.297	92.291	92.285	92.279	92.273	92.267	92.261	92.255	92.249	92.243	92.237	92.231	92.225	92.219	92.213	92.207	92.201	92.195	92.189	92.183	92.177	92.171	92.165	92.159	92.153	92.147	92.141	92.135	92.129	92.123	92.117	92.111	92.105	92.099	92.093	92.087	92.081	92.075	92.069	92.063	92.057	92.051	92.045	92.039	92.033	92.027	92.021	92.015	92.009	92.003	91.997	91.991	91.985	91.979	91.973	91.967	91.961	91.955	91.949	91.943	91.937	91.931	91.925	91.919	91.913	91.907	91.901	91.895	91.889	91.883	91.877	91.871	91.865	91.859	91.853	91.847	91.841	91.835	91.829	91.823	91.817	91.811	91.805	91.799	91.793	91.787	91.781	91.775	91.769	91.763	91.757	91.751	91.745	91.739	91.733	91.727	91.721	91.715	91.709	91.703	91.697	91.691	91.685	91.679	91.673	91.667	91.661	91.655	91.649	91.643	91.637	91.631	91.625	91.619	91.613	91.607	91.601	91.595	91.589	91.583	91.577	91.571	91.565	91.559	91.553	91.547	91.541	91.535	91.529	91.523	91.517	91.511	91.505	91.499	91.493	91.487	91.481	91.475	91.469	91.463	91.457	91.451	91.445	91.439	91.433	91.427	91.421	91.415	91.409	91.403	91.397	91.391	91.385	91.379	91.373	91.367	91.361	91.355	91.349	91.343	91.337	91.331	91.325	91.319	91.313	91.307	91.301	91.295	91.289	91.283	91.277	91.271	91.265	91.259	91.253	91.247	91.241	91.235	91.229	91.223	91.217	91.211	91.205	91.199	91.193	91.187	91.181	91.175	91.169	91.163	91.157	91.151	91.145	91.139	91.133	91.127	91.121	91.115	91.109	91.103	91.097	91.091	91.085	91.079	91.073	91.067	91.061	91.055	91.049	91.043	91.037	91.031



Stationing	Proposed Road Level	Existing Ground Level	Level Below	Left Toe Level	Vertical Profile
94.754	95.595	95.971			
95.055	95.528	95.947			
95.433	95.527	95.953			
95.978	95.499	95.920			
96.430	95.460	95.880			
96.844	95.420	95.838			
97.216	95.378	95.794			
97.544	95.334	95.748			
97.828	95.288	95.700			
98.064	95.240	95.650			
98.252	95.190	95.598			
98.392	95.138	95.544			
98.484	95.084	95.488			
98.528	95.028	95.430			
98.524	94.972	95.370			
98.464	94.914	95.308			
98.352	94.852	95.244			
98.188	94.786	95.178			
97.972	94.716	95.108			
97.704	94.642	95.034			
97.384	94.564	94.956			
96.912	94.472	94.864			
96.388	94.368	94.758			
95.812	94.252	94.638			
95.184	94.124	94.504			
94.504	93.984	94.356			
93.768	93.832	94.204			
92.976	93.668	94.048			
92.128	93.492	93.888			
91.224	93.304	93.724			
90.264	93.104	93.556			
89.248	92.892	93.384			
88.176	92.668	93.208			
87.048	92.432	93.028			
85.864	92.184	92.844			
84.624	91.924	92.656			
83.328	91.652	92.464			
81.976	91.368	92.268			
80.568	91.072	92.068			
79.104	90.764	91.864			
77.584	90.444	91.656			
76.008	90.112	91.444			
74.376	89.768	91.228			
72.688	89.412	91.008			
70.944	89.044	90.784			
69.144	88.664	90.556			
67.288	88.272	90.324			
65.376	87.868	90.088			
63.408	87.452	89.848			
61.484	87.024	89.604			
59.504	86.584	89.356			
57.568	86.132	89.104			
55.576	85.668	88.848			
53.528	85.192	88.588			
51.524	84.704	88.324			
49.464	84.204	88.056			
47.348	83.692	87.784			
45.176	83.168	87.508			
42.948	82.632	87.228			
40.664	82.084	86.944			
38.324	81.524	86.656			
35.928	80.952	86.364			
33.476	80.368	86.068			
30.968	79.772	85.768			
28.404	79.164	85.464			
25.784	78.544	85.156			
23.108	77.912	84.844			
20.376	77.268	84.528			
17.588	76.612	84.208			
14.744	75.944	83.884			
11.844	75.264	83.556			
8.888	74.572	83.224			
5.876	73.868	82.888			
2.808	73.152	82.548			
0.684	72.424	82.204			
-1.496	71.684	81.856			
-3.728	70.932	81.504			
-5.912	70.168	81.148			
-8.048	69.392	80.788			
-10.136	68.604	80.424			
-12.176	67.804	80.056			
-14.168	67.004	79.684			
-16.112	66.192	79.308			
-18.008	65.368	78.928			
-19.856	64.532	78.544			
-21.656	63.684	78.156			
-23.408	62.824	77.764			
-25.112	61.952	77.368			
-26.768	61.068	76.968			
-28.376	60.172	76.564			
-29.936	59.264	76.156			
-31.448	58.344	75.744			
-32.912	57.412	75.328			
-34.328	56.468	74.908			
-35.696	55.512	74.484			
-37.016	54.544	74.056			
-38.288	53.564	73.624			
-39.512	52.572	73.188			
-40.688	51.568	72.748			
-41.816	50.552	72.304			
-42.896	49.524	71.856			
-43.928	48.484	71.404			
-44.912	47.432	70.948			
-45.848	46.368	70.488			
-46.736	45.292	70.024			
-47.576	44.204	69.556			
-48.368	43.104	69.084			
-49.112	41.992	68.608			
-49.808	40.868	68.128			
-50.456	39.732	67.644			
-51.056	38.584	67.156			
-51.608	37.424	66.664			
-52.112	36.252	66.168			
-52.568	35.068	65.668			
-53.076	33.872	65.164			
-53.536	32.664	64.656			
-53.948	31.444	64.144			
-54.312	30.212	63.628			
-54.628	28.968	63.108			
-54.896	27.712	62.584			
-55.116	26.444	62.056			
-55.288	25.164	61.524			
-55.412	23.872	60.988			
-55.488	22.568	60.448			
-55.516	21.252	59.904			
-55.496	19.924	59.356			
-55.428	18.584	58.804			
-55.312	17.232	58.248			
-55.148	15.868	57.688			
-54.936	14.492	57.124			
-54.676	13.104	56.556			
-54.368	11.704	55.984			
-54.012	10.292	55.408			
-53.608	8.868	54.828			
-53.156	7.432	54.244			
-52.656	5.984	53.656			
-52.108	4.524	53.064			
-51.512	3.052	52.468			
-50.868	1.568	51.868			
-50.176	0.072	51.264			
-49.436	-1.424	50.656			
-48.648	-2.912	50.044			
-47.812	-4.384	49.428			
-46.928	-5.840	48.808			
-45.996	-7.272	48.184			
-45.016	-8.680	47.556			
-43.988	-10.064	46.924			
-42.912	-11.424	46.288			
-41.788	-12.760	45.648			
-40.616	-14.072	45.004			
-39.396	-15.360	44.356			
-38.128	-16.624	43.704			
-36.812	-17.864	43.048			
-35.448	-19.080	42.388			
-34.036	-20.272	41.724			
-32.576	-21.440	41.056			
-31.068	-22.584	40.384			
-29.512	-23.704	39.708			
-27.912	-24.800	39.028			
-26.268	-25.872	38.344			
-24.580	-26.920	37.656			
-22.848	-27.944	36.964			
-21.072	-28.944	36.268			
-19.252	-29.920	35.568			
-17.384	-30.872	34.864			
-15.468	-31.792	34.156			
-13.504	-32.680	33.444			
-11.492	-33.536	32.728			
-9.432	-34.360	32.008			
-7.324	-35.152	31.284			
-5.168	-35.912	30.556			
-2.964	-36.640	29.824			
-0.712	-37.336	29.088			
1.576	-38.000	28.348			
3.808	-38.632	27.604			
5.984	-39.232	26.856			
8.104	-39.800	26.104			
10.168	-40.336	25.348			
12.176	-40.840	24.588			
14.128	-41.312	23.824			
16.032	-41.752	23.056			
17.888	-42.160	22.284			
19.696	-42.536	21.508			
21.456	-42.880	20.728			
23.168	-43.192	19.944			
24.832	-43.472	19.156			
26.448	-43.720	18.364			
28.016	-43.936	17.568			
29.536	-44.120	16.768			
31.008	-44.280	15.964			
32.432	-44.416	15.156			
33.808	-44.528	14.344			
35.136	-44.616	13.528			
36.416	-44.680	12.708			
37.648	-44.720	11.884			
38.832	-44.736	11.056			
39.968	-44.728	10.224			
41.056	-44.696	9.388			
42.096	-44.640	8.548			
43.088	-44.560	7.704			
44.032	-44.456	6.856			
44.928	-44.328	6.004			
45.776	-44.176	5.148			
46.576	-44.000	4.288			
47.328	-43.800	3.424			
48.032	-43.576	2.556			
48.688	-43.328	1.684			
49.296	-43.056	0.808			
49.856	-42.760	0.028			
50.368	-42.440	-0.756			
50.832	-42.096	-1.524			
51.248	-41.728	-2.288			
51.616	-41.336	-3.048			
51.936	-40.920	-3.804			
52.208	-40.480	-4.556			
52.432	-40.016	-5.304			
52.608	-39.528	-6.048			
52.736	-39.016	-6.788			
52.816	-38.480	-7.524			
52.848	-37.920	-8.256			
52.824	-37.336	-8.984			
52.744	-36.728	-9.708			
52.608	-36.104	-10.428			
52.416	-35.464	-11.144			
52.168	-34.808	-11.856			
51.964	-34.136	-12.564			
51.704	-33.448	-13.268			
51.488	-32.744	-13.968			
51.216	-32.024	-14.664			
50.888	-31.288	-15.356			
50.504	-30.536	-16.044			
50.064	-29.768	-16.728			
49.568	-28.984	-17.408			
49.016	-28.184	-18.084			
48.408	-27.368	-18.756			
47.744	-26.536	-19.424			
47.024	-25.688	-20.088			
46.248	-24.824	-20.748			
45.416	-23.944	-21.404			
44.528	-23.048	-22.056			
43.584	-22.136	-22.704			
42.584	-21.208	-23.348			
41.528	-20.264	-23.988			
40.416	-19.304	-24.624			

← BERHAMPUR

BANGI JN. →



DATUM = 90.00	FINISHED ROAD LEVEL	EXISTING GROUND LEVEL BELOW PROPOSED CL	ELEV. F.V.L.	VERTICAL PROFILE	STATIONING
90.00	90.00	0.00	90.00		10+00
90.00	90.00	0.00	90.00		10+50
90.00	90.00	0.00	90.00		11+00
90.00	90.00	0.00	90.00		11+50
90.00	90.00	0.00	90.00		12+00
90.00	90.00	0.00	90.00		12+50
90.00	90.00	0.00	90.00		13+00
90.00	90.00	0.00	90.00		13+50
90.00	90.00	0.00	90.00		14+00
90.00	90.00	0.00	90.00		14+50
90.00	90.00	0.00	90.00		15+00

WIDENING AND STRENGTHENING TO TWO LANE PLAN AND LONGITUDINAL SECTION
 BERHAMPUR TO BANGI JN. (SH-17) KM 31/500 TO KM 37/500

ORISSA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE

PROJECT:

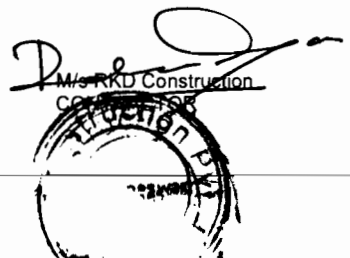
LEGEND

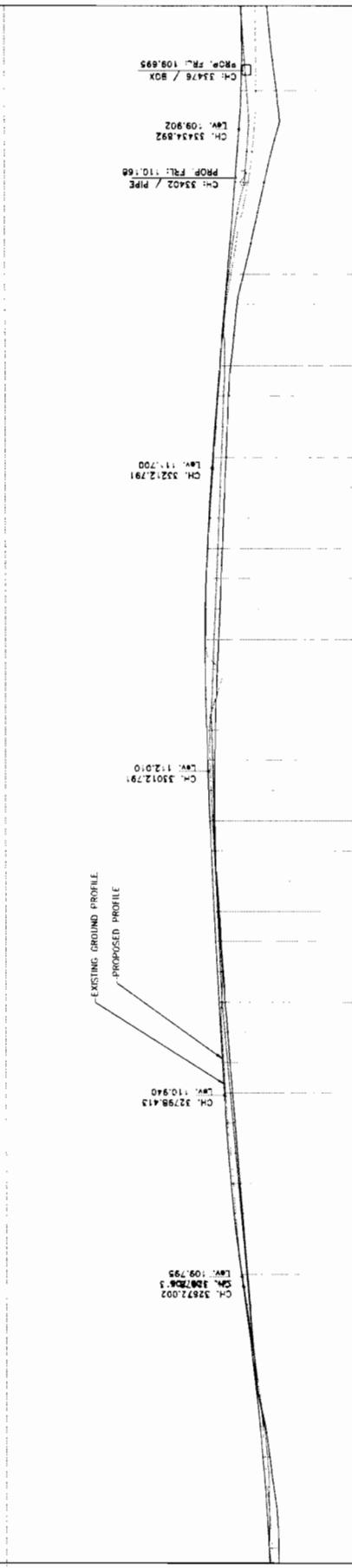
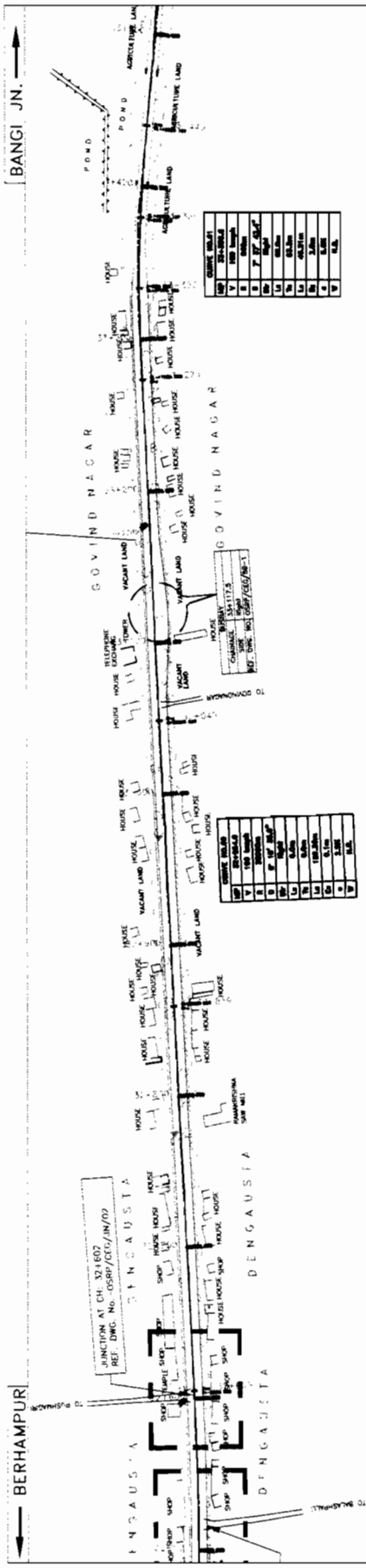
CHIEF ENGINEER
 World Bank Projects, Odisha
EMPLOYER

CHIEF ENGINEER
 State Bank of India
EMPLOYER

CHIEF ENGINEER
 O/o the E.T.C. (Civil), Odisha
EMPLOYER

CHIEF ENGINEER
 State Bank of India
EMPLOYER





DATUM = 96.00

STATION	EXISTING GROUND LEVEL	PROPOSED CL. LEVEL	VERTICAL CURVE
107.92	107.92	107.92	
107.94	107.94	107.94	
107.96	107.96	107.96	
107.98	107.98	107.98	
108.00	108.00	108.00	
108.02	108.02	108.02	
108.04	108.04	108.04	
108.06	108.06	108.06	
108.08	108.08	108.08	
108.10	108.10	108.10	
108.12	108.12	108.12	
108.14	108.14	108.14	
108.16	108.16	108.16	
108.18	108.18	108.18	
108.20	108.20	108.20	
108.22	108.22	108.22	
108.24	108.24	108.24	
108.26	108.26	108.26	
108.28	108.28	108.28	
108.30	108.30	108.30	
108.32	108.32	108.32	
108.34	108.34	108.34	
108.36	108.36	108.36	
108.38	108.38	108.38	
108.40	108.40	108.40	
108.42	108.42	108.42	
108.44	108.44	108.44	
108.46	108.46	108.46	
108.48	108.48	108.48	
108.50	108.50	108.50	
108.52	108.52	108.52	
108.54	108.54	108.54	
108.56	108.56	108.56	
108.58	108.58	108.58	
108.60	108.60	108.60	
108.62	108.62	108.62	
108.64	108.64	108.64	
108.66	108.66	108.66	
108.68	108.68	108.68	
108.70	108.70	108.70	
108.72	108.72	108.72	
108.74	108.74	108.74	
108.76	108.76	108.76	
108.78	108.78	108.78	
108.80	108.80	108.80	
108.82	108.82	108.82	
108.84	108.84	108.84	
108.86	108.86	108.86	
108.88	108.88	108.88	
108.90	108.90	108.90	
108.92	108.92	108.92	
108.94	108.94	108.94	

WIDENING AND STRENGTHENING TO TWO LANE PLAN AND LONGITUDINAL SECTION
BERHAMPUR TO BANGI Jn. (SH-17) KM 32/500 TO KM 33/500

ORISSA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE

PROJECT:-

LEGEND:

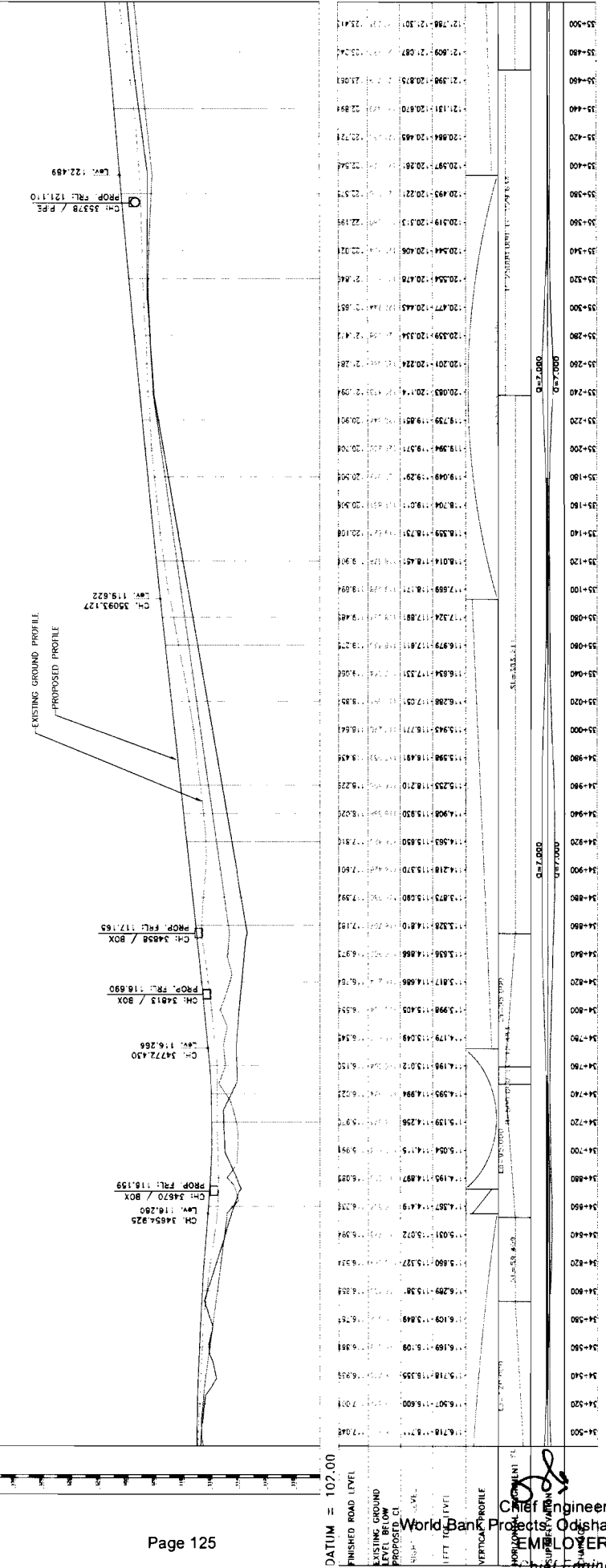
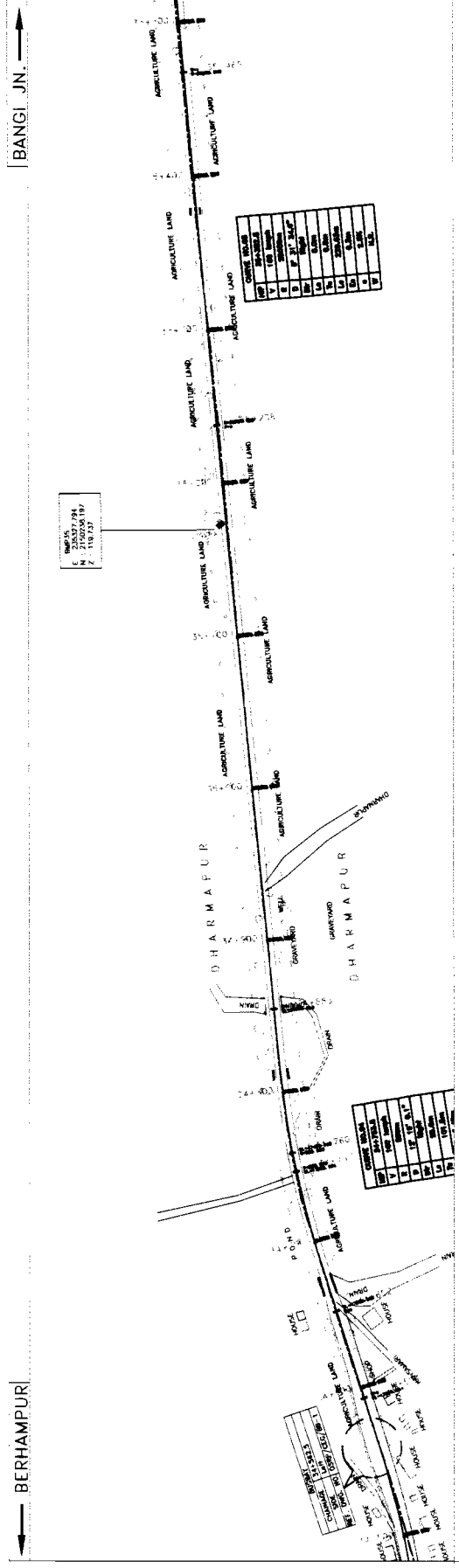
- EXISTING GROUND LINE
- PROPOSED CL. LINE
- VERTICAL CURVE
- EXISTING ROAD WIDTH
- PROPOSED ROAD WIDTH
- EXISTING ROAD CROSS SECTION
- PROPOSED ROAD CROSS SECTION
- EXISTING ROAD SURFACE
- PROPOSED ROAD SURFACE
- EXISTING ROAD GRADE
- PROPOSED ROAD GRADE
- EXISTING ROAD ALIGNMENT
- PROPOSED ROAD ALIGNMENT
- EXISTING ROAD CENTERLINE
- PROPOSED ROAD CENTERLINE
- EXISTING ROAD RIGHT OF WAY
- PROPOSED ROAD RIGHT OF WAY
- EXISTING ROAD LEFT OF WAY
- PROPOSED ROAD LEFT OF WAY
- EXISTING ROAD BOUNDARY
- PROPOSED ROAD BOUNDARY
- EXISTING ROAD SETBACK
- PROPOSED ROAD SETBACK
- EXISTING ROAD EASEMENT
- PROPOSED ROAD EASEMENT
- EXISTING ROAD ENCROACHMENT
- PROPOSED ROAD ENCROACHMENT
- EXISTING ROAD OBSTRUCTION
- PROPOSED ROAD OBSTRUCTION
- EXISTING ROAD INTERSECTION
- PROPOSED ROAD INTERSECTION
- EXISTING ROAD JUNCTION
- PROPOSED ROAD JUNCTION
- EXISTING ROAD BRIDGE
- PROPOSED ROAD BRIDGE
- EXISTING ROAD TUNNEL
- PROPOSED ROAD TUNNEL
- EXISTING ROAD UNDERPASS
- PROPOSED ROAD UNDERPASS
- EXISTING ROAD OVERPASS
- PROPOSED ROAD OVERPASS
- EXISTING ROAD CULVERT
- PROPOSED ROAD CULVERT
- EXISTING ROAD DRAINAGE
- PROPOSED ROAD DRAINAGE
- EXISTING ROAD FENCE
- PROPOSED ROAD FENCE
- EXISTING ROAD SIGN
- PROPOSED ROAD SIGN
- EXISTING ROAD LIGHTING
- PROPOSED ROAD LIGHTING
- EXISTING ROAD LANDSCAPE
- PROPOSED ROAD LANDSCAPE
- EXISTING ROAD UTILITIES
- PROPOSED ROAD UTILITIES
- EXISTING ROAD STRUCTURES
- PROPOSED ROAD STRUCTURES
- EXISTING ROAD OBSTACLES
- PROPOSED ROAD OBSTACLES
- EXISTING ROAD CLEARANCES
- PROPOSED ROAD CLEARANCES
- EXISTING ROAD VISIBILITY
- PROPOSED ROAD VISIBILITY
- EXISTING ROAD SAFETY
- PROPOSED ROAD SAFETY
- EXISTING ROAD SECURITY
- PROPOSED ROAD SECURITY
- EXISTING ROAD ACCESS
- PROPOSED ROAD ACCESS
- EXISTING ROAD EGRESS
- PROPOSED ROAD EGRESS
- EXISTING ROAD ESCAPE
- PROPOSED ROAD ESCAPE
- EXISTING ROAD REFUGES
- PROPOSED ROAD REFUGES
- EXISTING ROAD SHELTERS
- PROPOSED ROAD SHELTERS
- EXISTING ROAD SHELTERS
- PROPOSED ROAD SHELTERS

Scale: HORIZONTAL: 1:1000, VERTICAL: 1:100

DATE: 10/10/2018, REV: 01

DESIGNER: M/s RKD Construction, ENGINEER: M/s RKD Construction

M/s RKD Construction
CONTRACTOR



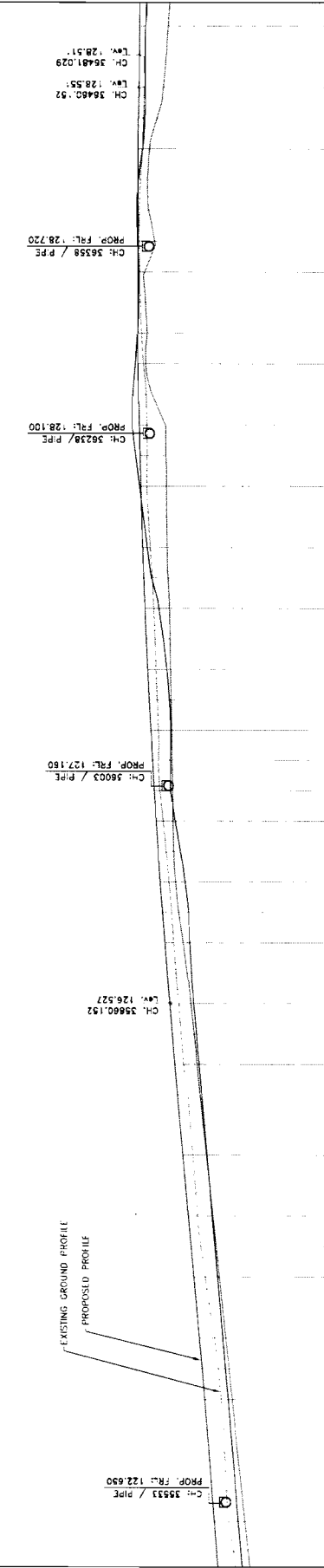
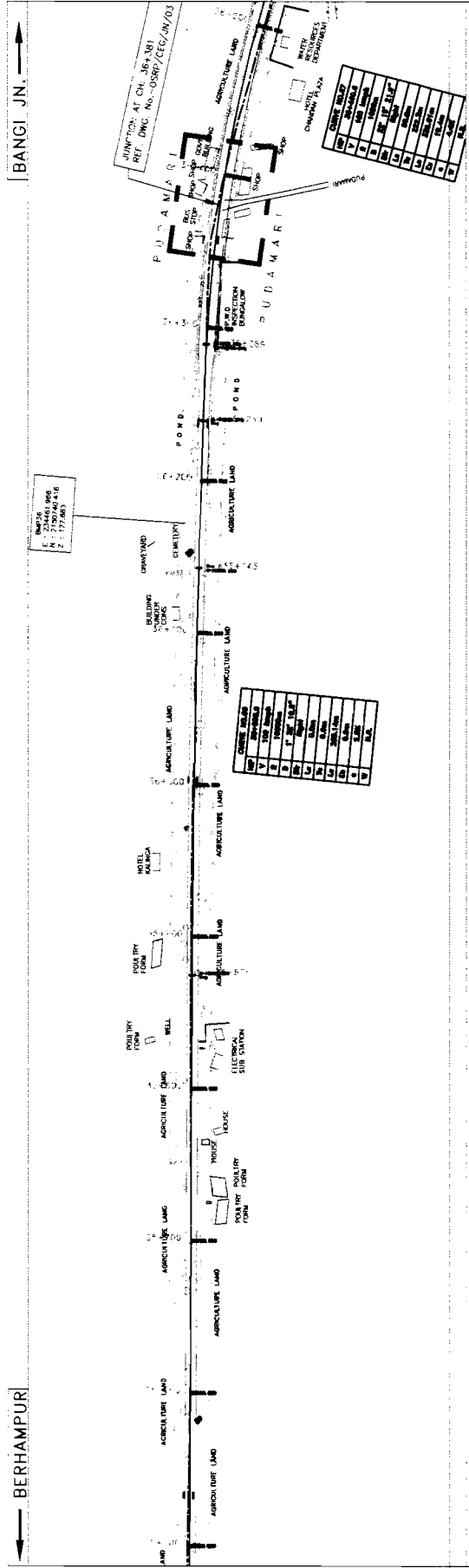
STATIONING	EXISTING GROUND LEVEL	PROPOSED PROFILE	VERTICAL CURVE DATA
34+500	102.00	102.00	
34+520	102.00	102.00	
34+540	102.00	102.00	
34+560	102.00	102.00	
34+580	102.00	102.00	
34+600	102.00	102.00	
34+620	102.00	102.00	
34+640	102.00	102.00	
34+660	102.00	102.00	
34+680	102.00	102.00	
34+700	102.00	102.00	
34+720	102.00	102.00	
34+740	102.00	102.00	
34+760	102.00	102.00	
34+780	102.00	102.00	
34+800	102.00	102.00	
34+820	102.00	102.00	
34+840	102.00	102.00	
34+860	102.00	102.00	
34+880	102.00	102.00	
34+900	102.00	102.00	
34+920	102.00	102.00	
34+940	102.00	102.00	
34+960	102.00	102.00	
34+980	102.00	102.00	
35+000	102.00	102.00	

M/s BKDC Construction CONTRACTORS
 R. Rudra Kumar

DATUM = 102.00
 FINISHED ROAD LEVEL
 EXISTING GROUND LEVEL BELOW PROPOSED CL
 Chief Engineer
 World Bank Projects, Odisha
 Chief Engineer
 Page 52 of 83 project
 (to the E.I.C. (Civil), Odisha
 Bhubaneswar.

PROJECT:-
 ORISSA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE
 WIDENING AND STRENGTHENING TO TWO LANE
 PLAN AND LONGITUDINAL SECTION
 BERHAMPUR TO BANGI Jn. (SH-17) KM 34/500 TO KM 35/500

REV.	NO.	DATE	BY	CHKD.	SCALE
1	1	17/07/2017			HORIZONTAL: 1:2000 VERTICAL: 1:1000

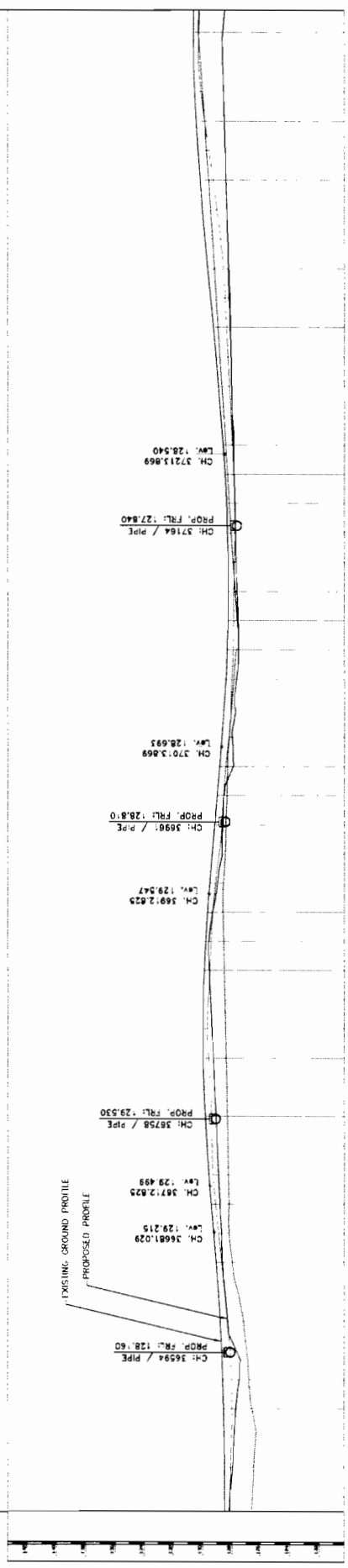
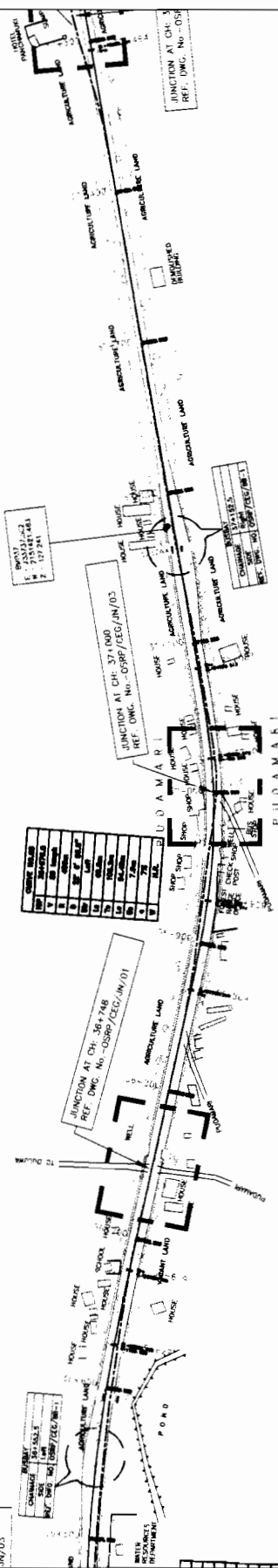


FINISHED ROAD LEVEL	EXISTING GROUND LEVEL BELOW PROPOSED CL	PROPOSED CL	LEFT	RIGHT	VERTICAL PROFILE
122.966	122.916	122.931	122.931	122.931	
122.956	122.946	122.961	122.961	122.961	
122.946	122.936	122.951	122.951	122.951	
122.936	122.926	122.941	122.941	122.941	
122.926	122.916	122.931	122.931	122.931	
122.916	122.906	122.921	122.921	122.921	
122.906	122.896	122.911	122.911	122.911	
122.896	122.886	122.901	122.901	122.901	
122.886	122.876	122.891	122.891	122.891	
122.876	122.866	122.881	122.881	122.881	
122.866	122.856	122.871	122.871	122.871	
122.856	122.846	122.861	122.861	122.861	
122.846	122.836	122.851	122.851	122.851	
122.836	122.826	122.841	122.841	122.841	
122.826	122.816	122.831	122.831	122.831	
122.816	122.806	122.821	122.821	122.821	
122.806	122.796	122.811	122.811	122.811	
122.796	122.786	122.801	122.801	122.801	
122.786	122.776	122.791	122.791	122.791	
122.776	122.766	122.781	122.781	122.781	
122.766	122.756	122.771	122.771	122.771	
122.756	122.746	122.761	122.761	122.761	
122.746	122.736	122.751	122.751	122.751	
122.736	122.726	122.741	122.741	122.741	
122.726	122.716	122.731	122.731	122.731	
122.716	122.706	122.721	122.721	122.721	
122.706	122.696	122.711	122.711	122.711	
122.696	122.686	122.701	122.701	122.701	
122.686	122.676	122.691	122.691	122.691	
122.676	122.666	122.681	122.681	122.681	
122.666	122.656	122.671	122.671	122.671	
122.656	122.646	122.661	122.661	122.661	
122.646	122.636	122.651	122.651	122.651	
122.636	122.626	122.641	122.641	122.641	
122.626	122.616	122.631	122.631	122.631	
122.616	122.606	122.621	122.621	122.621	
122.606	122.596	122.611	122.611	122.611	
122.596	122.586	122.601	122.601	122.601	
122.586	122.576	122.591	122.591	122.591	
122.576	122.566	122.581	122.581	122.581	
122.566	122.556	122.571	122.571	122.571	
122.556	122.546	122.561	122.561	122.561	
122.546	122.536	122.551	122.551	122.551	
122.536	122.526	122.541	122.541	122.541	
122.526	122.516	122.531	122.531	122.531	
122.516	122.506	122.521	122.521	122.521	
122.506	122.496	122.511	122.511	122.511	
122.496	122.486	122.501	122.501	122.501	
122.486	122.476	122.491	122.491	122.491	
122.476	122.466	122.481	122.481	122.481	
122.466	122.456	122.471	122.471	122.471	
122.456	122.446	122.461	122.461	122.461	
122.446	122.436	122.451	122.451	122.451	
122.436	122.426	122.441	122.441	122.441	
122.426	122.416	122.431	122.431	122.431	
122.416	122.406	122.421	122.421	122.421	
122.406	122.396	122.411	122.411	122.411	
122.396	122.386	122.401	122.401	122.401	
122.386	122.376	122.391	122.391	122.391	
122.376	122.366	122.381	122.381	122.381	
122.366	122.356	122.371	122.371	122.371	
122.356	122.346	122.361	122.361	122.361	
122.346	122.336	122.351	122.351	122.351	
122.336	122.326	122.341	122.341	122.341	
122.326	122.316	122.331	122.331	122.331	
122.316	122.306	122.321	122.321	122.321	
122.306	122.296	122.311	122.311	122.311	
122.296	122.286	122.301	122.301	122.301	
122.286	122.276	122.291	122.291	122.291	
122.276	122.266	122.281	122.281	122.281	
122.266	122.256	122.271	122.271	122.271	
122.256	122.246	122.261	122.261	122.261	
122.246	122.236	122.251	122.251	122.251	
122.236	122.226	122.241	122.241	122.241	
122.226	122.216	122.231	122.231	122.231	
122.216	122.206	122.221	122.221	122.221	
122.206	122.196	122.211	122.211	122.211	
122.196	122.186	122.201	122.201	122.201	
122.186	122.176	122.191	122.191	122.191	
122.176	122.166	122.181	122.181	122.181	
122.166	122.156	122.171	122.171	122.171	
122.156	122.146	122.161	122.161	122.161	
122.146	122.136	122.151	122.151	122.151	
122.136	122.126	122.141	122.141	122.141	
122.126	122.116	122.131	122.131	122.131	
122.116	122.106	122.121	122.121	122.121	
122.106	122.096	122.111	122.111	122.111	
122.096	122.086	122.101	122.101	122.101	
122.086	122.076	122.091	122.091	122.091	
122.076	122.066	122.081	122.081	122.081	
122.066	122.056	122.071	122.071	122.071	
122.056	122.046	122.061	122.061	122.061	
122.046	122.036	122.051	122.051	122.051	
122.036	122.026	122.041	122.041	122.041	
122.026	122.016	122.031	122.031	122.031	
122.016	122.006	122.021	122.021	122.021	
122.006	121.996	122.011	122.011	122.011	
121.996	121.986	122.001	122.001	122.001	
121.986	121.976	121.991	121.991	121.991	
121.976	121.966	121.981	121.981	121.981	
121.966	121.956	121.971	121.971	121.971	
121.956	121.946	121.961	121.961	121.961	
121.946	121.936	121.951	121.951	121.951	
121.936	121.926	121.941	121.941	121.941	
121.926	121.916	121.931	121.931	121.931	
121.916	121.906	121.921	121.921	121.921	
121.906	121.896	121.911	121.911	121.911	
121.896	121.886	121.901	121.901	121.901	
121.886	121.876	121.891	121.891	121.891	
121.876	121.866	121.881	121.881	121.881	
121.866	121.856	121.871	121.871	121.871	
121.856	121.846	121.861	121.861	121.861	
121.846	121.836	121.851	121.851	121.851	
121.836	121.826	121.841	121.841	121.841	
121.826	121.816	121.831	121.831	121.831	
121.816	121.806	121.821	121.821	121.821	
121.806	121.796	121.811	121.811	121.811	
121.796	121.786	121.801	121.801	121.801	
121.786	121.776	121.791	121.791	121.791	
121.776	121.766	121.781	121.781	121.781	
121.766	121.756	121.771	121.771	121.771	
121.756	121.746	121.761	121.761	121.761	
121.746	121.736	121.751	121.751	121.751	
121.736	121.726	121.741	121.741	121.741	
121.726	121.716	121.731	121.731	121.731	
121.716	121.706	121.721	121.721	121.721	
121.706	121.696	121.711	121.711	121.711	
121.696	121.686	121.701	121.701	121.701	
121.686	121.676	121.691	121.691	121.691	
121.676	121.666	121.681	121.681	121.681	
121.666	121.656	121.671	121.671	121.671	
121.656	121.646	121.661	121.661	121.661	
121.646	121.636	121.651	121.651	121.651	
121.636	121.626	121.641	121.641	121.641	
121.626	121.616	121.631	121.631	121.631	
121.616	121.606	121.621	121.621	121.621	
121.606	121.596	121.611	121.611	121.611	
121.596	121.586	121.601	121.601	121.601	
121.586	121.576	121.591	121.591	121.591	
121.576	121.566	121.581	121.581	121.581	
121.566	121.556	121.571	121.571	121.571	
121.556	121.546	121.561	121.561	121.561	
121.546	121.536	121.551	121.551	121.551	
121.536	121.526	121.541	121.541	121.541	
121.526	121.516	121.531	121.531	121.531	
121.516	121.506	121.521	121.521	121.521	
121.506	121.496	121.511	121.511	121.511	
121.496	121.486	121.501	121.501	121.501	
121.486	121.476	121.491	121.491	121.491	
121.476	121.466	121.481	121.481	121.481	
121.466	121.456	121.471	121.471	121.471	
121.456	121.446	121.461	121.461	121.461	
121.446	121.436	121.451	121.451	121.451	
121.436	121.426	121.441	121.441	121.441	
121.426	121.416	121.431	121.431	121.431	
121.416	121.406	121.421	121.421	121.421	
121.406	121.396	121.411	121.411	121.411	
121.396	121.386	121.401	121.401	121.401	
121.386	121.376	121.391	121.391	121.391	
121.376	121.366	121.381	121.381	121.381	
121.366	121.356	121.371	121.371	121.371	
121.356	121.346	121.361	121.361	121.361	
121.346	121.336	121.351	121.351	121.351	
121.336	121.326	121.341	121.341	121.341	
121.326	121.316	121.331	121.331	121.331	
121.316	121.306	121.321	121.321	121.321	
121.306	121.296	121.311	121.311	121.311	
121.296	121.286	121.301	121.301	121.301	
121.286	121.276	121.291	121.291	121.291	
121.276	121.266	121.281	121.281	121.281	
121.266	121.256	121.271	121.271	121.271	
121.256	121.246	121.261	121.261	121.261	
121.246	121.236	121.251	121.251	121.251	
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121.226	121.216	121.231	121.231	121.231	
121.216	121.206				

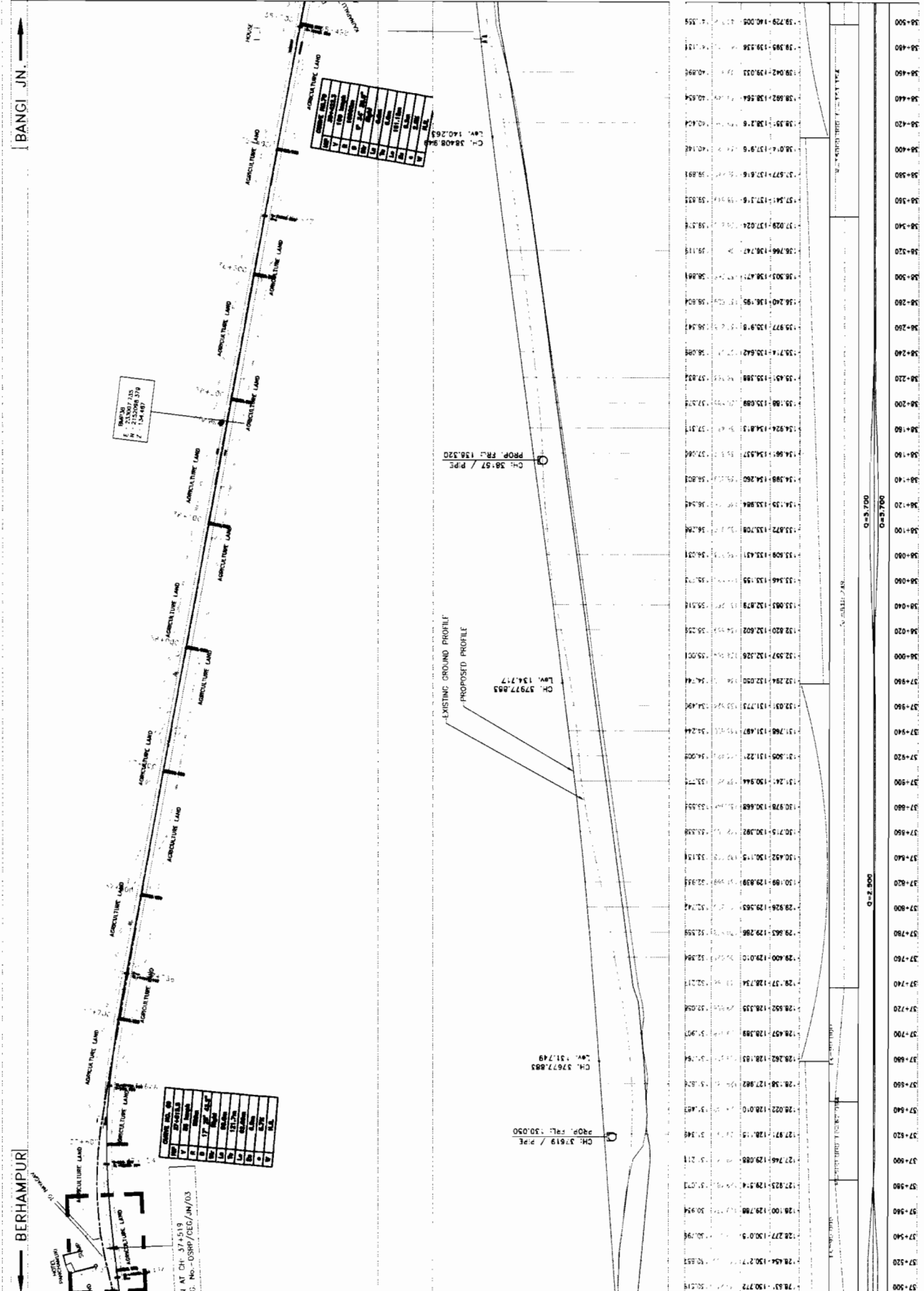
BERHAMPUR

BANGI JN.

[Signature]
M/s RKD Construction
CONTRACTOR



CHAINAGE	EXISTING GROUND LEVEL	PROPOSED ROAD LEVEL	PROPOSED GROUND LEVEL	PROPOSED GROUND LEVEL BELOW
37+000	128.50	128.50	128.50	0.00
37+050	128.55	128.55	128.55	0.00
37+100	128.60	128.60	128.60	0.00
37+150	128.65	128.65	128.65	0.00
37+200	128.70	128.70	128.70	0.00
37+250	128.75	128.75	128.75	0.00
37+300	128.80	128.80	128.80	0.00
37+350	128.85	128.85	128.85	0.00
37+400	128.90	128.90	128.90	0.00
37+450	128.95	128.95	128.95	0.00
37+500	129.00	129.00	129.00	0.00
37+550	129.05	129.05	129.05	0.00
37+600	129.10	129.10	129.10	0.00
37+650	129.15	129.15	129.15	0.00
37+700	129.20	129.20	129.20	0.00
37+750	129.25	129.25	129.25	0.00
37+800	129.30	129.30	129.30	0.00
37+850	129.35	129.35	129.35	0.00
37+900	129.40	129.40	129.40	0.00
37+950	129.45	129.45	129.45	0.00
38+000	129.50	129.50	129.50	0.00
38+050	129.55	129.55	129.55	0.00
38+100	129.60	129.60	129.60	0.00
38+150	129.65	129.65	129.65	0.00
38+200	129.70	129.70	129.70	0.00
38+250	129.75	129.75	129.75	0.00
38+300	129.80	129.80	129.80	0.00
38+350	129.85	129.85	129.85	0.00
38+400	129.90	129.90	129.90	0.00
38+450	129.95	129.95	129.95	0.00
38+500	130.00	130.00	130.00	0.00
38+550	130.05	130.05	130.05	0.00
38+600	130.10	130.10	130.10	0.00
38+650	130.15	130.15	130.15	0.00
38+700	130.20	130.20	130.20	0.00
38+750	130.25	130.25	130.25	0.00
38+800	130.30	130.30	130.30	0.00
38+850	130.35	130.35	130.35	0.00
38+900	130.40	130.40	130.40	0.00
38+950	130.45	130.45	130.45	0.00
39+000	130.50	130.50	130.50	0.00
39+050	130.55	130.55	130.55	0.00
39+100	130.60	130.60	130.60	0.00
39+150	130.65	130.65	130.65	0.00
39+200	130.70	130.70	130.70	0.00
39+250	130.75	130.75	130.75	0.00
39+300	130.80	130.80	130.80	0.00
39+350	130.85	130.85	130.85	0.00
39+400	130.90	130.90	130.90	0.00
39+450	130.95	130.95	130.95	0.00
39+500	131.00	131.00	131.00	0.00
39+550	131.05	131.05	131.05	0.00
39+600	131.10	131.10	131.10	0.00
39+650	131.15	131.15	131.15	0.00
39+700	131.20	131.20	131.20	0.00
39+750	131.25	131.25	131.25	0.00
39+800	131.30	131.30	131.30	0.00
39+850	131.35	131.35	131.35	0.00
39+900	131.40	131.40	131.40	0.00
39+950	131.45	131.45	131.45	0.00
40+000	131.50	131.50	131.50	0.00
40+050	131.55	131.55	131.55	0.00
40+100	131.60	131.60	131.60	0.00
40+150	131.65	131.65	131.65	0.00
40+200	131.70	131.70	131.70	0.00
40+250	131.75	131.75	131.75	0.00
40+300	131.80	131.80	131.80	0.00
40+350	131.85	131.85	131.85	0.00
40+400	131.90	131.90	131.90	0.00
40+450	131.95	131.95	131.95	0.00
40+500	132.00	132.00	132.00	0.00
40+550	132.05	132.05	132.05	0.00
40+600	132.10	132.10	132.10	0.00
40+650	132.15	132.15	132.15	0.00
40+700	132.20	132.20	132.20	0.00
40+750	132.25	132.25	132.25	0.00
40+800	132.30	132.30	132.30	0.00
40+850	132.35	132.35	132.35	0.00
40+900	132.40	132.40	132.40	0.00
40+950	132.45	132.45	132.45	0.00
41+000	132.50	132.50	132.50	0.00
41+050	132.55	132.55	132.55	0.00
41+100	132.60	132.60	132.60	0.00
41+150	132.65	132.65	132.65	0.00
41+200	132.70	132.70	132.70	0.00
41+250	132.75	132.75	132.75	0.00
41+300	132.80	132.80	132.80	0.00
41+350	132.85	132.85	132.85	0.00
41+400	132.90	132.90	132.90	0.00
41+450	132.95	132.95	132.95	0.00
41+500	133.00	133.00	133.00	0.00
41+550	133.05	133.05	133.05	0.00
41+600	133.10	133.10	133.10	0.00
41+650	133.15	133.15	133.15	0.00
41+700	133.20	133.20	133.20	0.00
41+750	133.25	133.25	133.25	0.00
41+800	133.30	133.30	133.30	0.00
41+850	133.35	133.35	133.35	0.00
41+900	133.40	133.40	133.40	0.00
41+950	133.45	133.45	133.45	0.00
42+000	133.50	133.50	133.50	0.00
42+050	133.55	133.55	133.55	0.00
42+100	133.60	133.60	133.60	0.00
42+150	133.65	133.65	133.65	0.00
42+200	133.70	133.70	133.70	0.00
42+250	133.75	133.75	133.75	0.00
42+300	133.80	133.80	133.80	0.00
42+350	133.85	133.85	133.85	0.00
42+400	133.90	133.90	133.90	0.00
42+450	133.95	133.95	133.95	0.00
42+500	134.00	134.00	134.00	0.00
42+550	134.05	134.05	134.05	0.00
42+600	134.10	134.10	134.10	0.00
42+650	134.15	134.15	134.15	0.00
42+700	134.20	134.20	134.20	0.00
42+750	134.25	134.25	134.25	0.00
42+800	134.30	134.30	134.30	0.00
42+850	134.35	134.35	134.35	0.00
42+900	134.40	134.40	134.40	0.00
42+950	134.45	134.45	134.45	0.00
43+000	134.50	134.50	134.50	0.00
43+050	134.55	134.55	134.55	0.00
43+100	134.60	134.60	134.60	0.00
43+150	134.65	134.65	134.65	0.00
43+200	134.70	134.70	134.70	0.00
43+250	134.75	134.75	134.75	0.00
43+300	134.80	134.80	134.80	0.00
43+350	134.85	134.85	134.85	0.00
43+400	134.90	134.90	134.90	0.00
43+450	134.95	134.95	134.95	0.00
43+500	135.00	135.00	135.00	0.00
43+550	135.05	135.05	135.05	0.00
43+600	135.10	135.10	135.10	0.00
43+650	135.15	135.15	135.15	0.00
43+700	135.20	135.20	135.20	0.00
43+750	135.25	135.25	135.25	0.00
43+800	135.30	135.30	135.30	0.00
43+850	135.35	135.35	135.35	0.00
43+900	135.40	135.40	135.40	0.00
43+950	135.45	135.45	135.45	0.00
44+000	135.50	135.50	135.50	0.00
44+050	135.55	135.55	135.55	0.00
44+100	135.60	135.60	135.60	0.00
44+150	135.65	135.65	135.65	0.00
44+200	135.70	135.70	135.70	0.00
44+250	135.75	135.75	135.75	0.00
44+300	135.80	135.80	135.80	0.00
44+350	135.85	135.85	135.85	0.00
44+400	135.90	135.90	135.90	0.00
44+450	135.95	135.95	135.95	0.00
44+500	136.00	136.00	136.00	0.00
44+550	136.05	136.05	136.05	0.00
44+600	136.10	136.10	136.10	0.00
44+650	136.15	136.15	136.15	0.00
44+700	136.20	136.20	136.20	0.00
44+750	136.25	136.25	136.25	0.00
44+800	136.30	136.30	136.30	0.00
44+850	136.35	136.35	136.35	0.00
44+900	136.40	136.40	136.40	0.00
44+950	136.45	136.45	136.45	0.00
45+000	136.50	136.50	136.50	0.00
45+050	136.55	136.55	136.55	0.00
45+100	136.60	136.60	136.60	0.00
45+150	136.65	136.65	136.65	0.00
45+200	136.70	136.70	136.70	0.00
45+250	136.75	136.75	136.75	0.00
45+300	136.80	136.80	136.80	0.00
45+350	136.85	136.85	136.85	0.00
45+400	136.90	136.90	136.90	0.00
45+450	136.95	136.95	136.95	0.00
45+500	137.00	137.00	137.00	0.00
45+550	137.05	137.05	137.05	0.00
45+600	137.10	137.10	137.10	0.00
45+650	137.15	137.15	137.15	0.00
45+700	137.20	137.20	137.20	0.00
45+750	137.25	137.25	137.25	0.00
45+800	137.30	137.30	137.30	0.00
45+850	137.35	137.35	137.35	0.00
45+900	137.40	137.40	137.40	0.00
45+950	137.45	137.45	137.45	0.00
46+000	137.50	137.50	137.50	0.00
46+050	137.55	137.55	137.55	0.00
46+100	137.60	137.60	137.60	0.00
46+150	137.65	137.65	137.65	0.00
46+200	137.70	137.70	137.70	0.00
46+250	137.75	137.75	137.75	0.00
46+300	137.80	137.80	137.80	0.00
46+350	137.85	137.85	137.85	0.00
46+400	137.90	137.90	137.90	0.00
46+450	137.95	137.95	137.95	0.00
46+500	138.00	138.00	138.00	0.00
46+550	138.05	138.05	138.05	0.00
46+600	138.10	138.10	138.10	0.00
46+650	138.15	138.15	138.15	0.00
46+700	138.20	138.20	138.20	0.00
46+750	138.25	138.25	138.25	0.00
46+800	138.30	138.30	138.30	0.00
46+850	138.35	138.35	138.35	0.00
46+900	138.40	138.40	138.40	0.00
46+950	138.45	138.45	138.45	0.00
47+000	138.50	138.50	138.50	0.00
47+050	138.55	138.55	138.55	0.00
47+100	138.60	138.60	138.60	0.00
47+150	138.65	138.65	138.65	0.00
47+200	138.70	138.70	138.70	0.00
47+250	138.75	138.75	138.75	0.00
47+300				



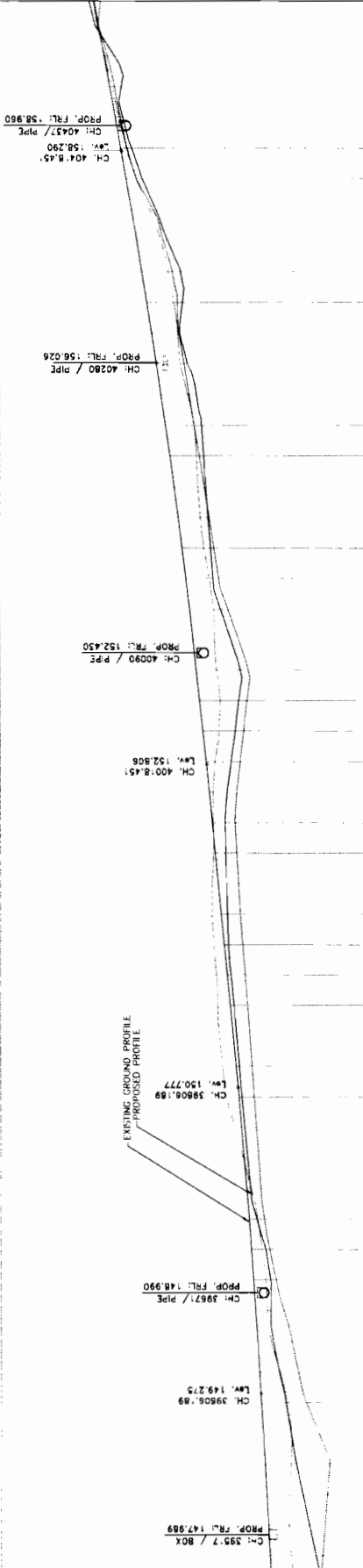
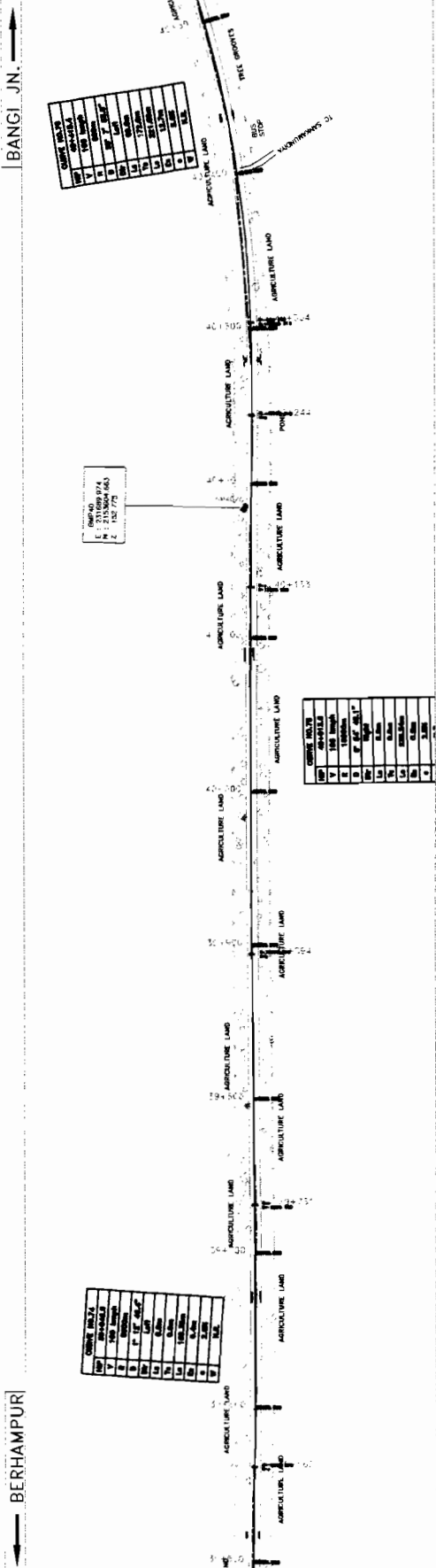
DATE	BY	REV	SCALE
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10/01/2017	DR	2	1:1000
10/01/2017	DR	3	1:1000
10/01/2017	DR	4	1:1000
10/01/2017	DR	5	1:1000
10/01/2017	DR	6	1:1000
10/01/2017	DR	7	1:1000
10/01/2017	DR	8	1:1000
10/01/2017	DR	9	1:1000
10/01/2017	DR	10	1:1000
10/01/2017	DR	11	1:1000
10/01/2017	DR	12	1:1000
10/01/2017	DR	13	1:1000
10/01/2017	DR	14	1:1000
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10/01/2017	DR	43	1:1000
10/01/2017	DR	44	1:1000
10/01/2017	DR	45	1:1000
10/01/2017	DR	46	1:1000
10/01/2017	DR	47	1:1000
10/01/2017	DR	48	1:1000
10/01/2017	DR	49	1:1000
10/01/2017	DR	50	1:1000

CH. NO.	CH. NAME	CH. DATE	CH. BY	CH. REV	CH. SCALE
37.619	PIPE	10/01/2017	DR	1	1:1000
37.749	PIPE	10/01/2017	DR	1	1:1000
37.885	PIPE	10/01/2017	DR	1	1:1000
37.977	PIPE	10/01/2017	DR	1	1:1000
38.000	PIPE	10/01/2017	DR	1	1:1000
38.020	PIPE	10/01/2017	DR	1	1:1000
38.040	PIPE	10/01/2017	DR	1	1:1000
38.060	PIPE	10/01/2017	DR	1	1:1000
38.080	PIPE	10/01/2017	DR	1	1:1000
38.100	PIPE	10/01/2017	DR	1	1:1000
38.120	PIPE	10/01/2017	DR	1	1:1000
38.140	PIPE	10/01/2017	DR	1	1:1000
38.160	PIPE	10/01/2017	DR	1	1:1000
38.180	PIPE	10/01/2017	DR	1	1:1000
38.200	PIPE	10/01/2017	DR	1	1:1000
38.220	PIPE	10/01/2017	DR	1	1:1000
38.240	PIPE	10/01/2017	DR	1	1:1000
38.260	PIPE	10/01/2017	DR	1	1:1000
38.280	PIPE	10/01/2017	DR	1	1:1000
38.300	PIPE	10/01/2017	DR	1	1:1000
38.320	PIPE	10/01/2017	DR	1	1:1000
38.340	PIPE	10/01/2017	DR	1	1:1000
38.360	PIPE	10/01/2017	DR	1	1:1000
38.380	PIPE	10/01/2017	DR	1	1:1000
38.400	PIPE	10/01/2017	DR	1	1:1000
38.420	PIPE	10/01/2017	DR	1	1:1000
38.440	PIPE	10/01/2017	DR	1	1:1000
38.460	PIPE	10/01/2017	DR	1	1:1000
38.480	PIPE	10/01/2017	DR	1	1:1000
38.500	PIPE	10/01/2017	DR	1	1:1000

DATE	BY	REV	SCALE
10/01/2017	DR	1	1:1000
10/01/2017	DR	2	1:1000
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10/01/2017	DR	8	1:1000
10/01/2017	DR	9	1:1000
10/01/2017	DR	10	1:1000
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10/01/2017	DR	47	1:1000
10/01/2017	DR	48	1:1000
10/01/2017	DR	49	1:1000
10/01/2017	DR	50	1:1000

[Signature]
 M/s RKD Construction
 CONTRACTOR





STATION	EXISTING GROUND LEVEL	PROPOSED LEVEL	VERTICAL CURVE DATA
150.000	150.000	150.000	
150.050	150.050	150.050	
150.100	150.100	150.100	
150.150	150.150	150.150	
150.200	150.200	150.200	
150.250	150.250	150.250	
150.300	150.300	150.300	
150.350	150.350	150.350	
150.400	150.400	150.400	
150.450	150.450	150.450	
150.500	150.500	150.500	
150.550	150.550	150.550	
150.600	150.600	150.600	
150.650	150.650	150.650	
150.700	150.700	150.700	
150.750	150.750	150.750	
150.800	150.800	150.800	
150.850	150.850	150.850	
150.900	150.900	150.900	
150.950	150.950	150.950	
151.000	151.000	151.000	
151.050	151.050	151.050	
151.100	151.100	151.100	
151.150	151.150	151.150	
151.200	151.200	151.200	
151.250	151.250	151.250	
151.300	151.300	151.300	
151.350	151.350	151.350	
151.400	151.400	151.400	
151.450	151.450	151.450	
151.500	151.500	151.500	
151.550	151.550	151.550	
151.600	151.600	151.600	
151.650	151.650	151.650	
151.700	151.700	151.700	
151.750	151.750	151.750	
151.800	151.800	151.800	
151.850	151.850	151.850	
151.900	151.900	151.900	
151.950	151.950	151.950	
152.000	152.000	152.000	
152.050	152.050	152.050	
152.100	152.100	152.100	
152.150	152.150	152.150	
152.200	152.200	152.200	
152.250	152.250	152.250	
152.300	152.300	152.300	
152.350	152.350	152.350	
152.400	152.400	152.400	
152.450	152.450	152.450	
152.500	152.500	152.500	
152.550	152.550	152.550	
152.600	152.600	152.600	
152.650	152.650	152.650	
152.700	152.700	152.700	
152.750	152.750	152.750	
152.800	152.800	152.800	
152.850	152.850	152.850	
152.900	152.900	152.900	
152.950	152.950	152.950	
153.000	153.000	153.000	

PROJECT:
 WIDENING AND STRENGTHENING TO TWO LANE
 PLAN AND LONGITUDINAL SECTION
 BERHAMPUR TO BANGI Jn. (SH-17) KM 39/500 TO KM 40/500

LEGEND:
 (Symbol) Existing Ground Profile
 (Symbol) Proposed Road Profile
 (Symbol) Vertical Curve
 (Symbol) Horizontal Curve
 (Symbol) Utility Lines
 (Symbol) Agricultural Land

SCALE:
 HORIZONTAL: 1:1000
 VERTICAL: 1:100

DATE: 15/07/2013
REV: 01
SCALE: 1:1000

**ORISSA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE**

**Chief Engineer
 Projects, Odisha
 EMPLOYER**

**Chief Engineer
 M/s BKD Construction
 FOR**



[Signature]

M/s RKD Construction
CONTRACTOR



SIGN POST ID	DESCRIPTION OF THE SIGN BOARD	CHAMANGE			LOCATION		
		CHAMANGE	LOCATION		RL	CR(L)	CR(R)
			LL	UL			
SP-10(c)	Right Hand Curve	7159	✓				
		24583	✓				
		41547	✓				
		42137	✓				
		4512	✓				
		8285	✓				
		9687	✓				
		10924	✓				
		25430	✓				
		29537	✓				
		34503	✓				
		37053	✓				
		41424	✓				
		41922	✓				
		42547	✓				
		43014	✓				
SP-10(b)	Left Hand Curve	4405	✓				
		8192	✓				
		9510	✓				
		10846	✓				
		25359	✓				
		36889	✓				
		41748	✓				
		42457	✓				
		42942	✓				
		7274	✓				
		24664	✓				
		41623	✓				
		42395	✓				
SP-10(g)	Right Hairpin Bend	-NIL-	✓				
SP-10(d)	Left Hairpin Bend	-NIL-	✓				
SP-10(e)	Right Reverse Bend	-NIL-	✓				
SP-10(f)	Left Reverse Bend	-NIL-	✓				

SIGN POST ID	DESCRIPTION OF THE SIGN BOARD	CHAMANGE			LOCATION		
		CHAMANGE	LOCATION		RL	CR(L)	CR(R)
			LL	UL			
SP-6	School Zone	9910	✓				
		10190	✓				
		13610	✓				
		13690	✓				
		17160	✓				
		17280	✓				
		20760	✓				
		20840	✓				
		34320	✓				
		34345	✓				
		38510	✓				
		38590	✓				
SP-8	CROSS ROAD	24630	✓				
		36788	✓				
		24630	✓				
SP-9(c)	Right Side Road	1826	✓				
		2658	✓				
		7085	✓				
		11388	✓				
		12680	✓				
		12910	✓				
		15866	✓				
		18624	✓				
		25063	✓				
		27247	✓				
		28682	✓				
		29531	✓				
		32462	✓				
		32538	✓				
SP-9(b)	Left Side Road	2066	✓				
		2418	✓				
		7325	✓				
		11828	✓				
		12670	✓				
		12920	✓				
		15726	✓				
		18284	✓				
		25303	✓				
		27007	✓				
		28432	✓				
		29391	✓				
		32398	✓				
		32722	✓				

SIGN POST ID	DESCRIPTION OF THE SIGN BOARD	CHAMANGE			LOCATION		
		CHAMANGE	LOCATION		RL	CR(L)	CR(R)
			LL	UL			
SP-1	Stop	1946	✓				
		3011	✓				
		5550	✓				
		7205	✓				
		11708	✓				
		12800	✓				
		16422	✓				
		22635	✓				
		25183	✓				
		32602	✓				
		37519	✓				
		2538	✓				
		8335	✓				
		12790	✓				
		15089	✓				
		15846	✓				
		18704	✓				
		27127	✓				
		28572	✓				
		29511	✓				
		32518	✓				
		36381	✓				
		37000	✓				
		36748	✓				
SP-4(c)	Speed Limit - 30	-NIL-	✓				
SP-4(b)	Speed Limit - 40	24583	✓				
		24643	✓				
SP-4(c)	Speed Limit - 50	41327	✓				
		41387	✓				
		41547	✓				
		41607	✓				
SP-4(d)	Speed Limit - 65	4405	✓				
		4465	✓				
		7159	✓				
		7219	✓				
		8192	✓				
		8252	✓				
		42137	✓				
		42187	✓				
		42457	✓				
		42517	✓				

SCHEDULE OF SIGN POSTS
BERHAMPUR TO TAPTANI (SH-17, KM 0 TO 41)

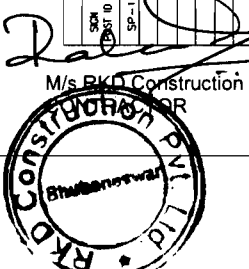
ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE.

PROJECT :-

DIRC NO. (OSRP/CG/SR-17/SCH 01)	REV. NO.	APPROVED
SH. NO. 44	DATE	PREPARED BY :
SCALE	REV	RD
	NTS	CG LIM.
		CG. World Bank Projects

Chief Engineer
World Bank Projects, Odisha
EMPLOYER

Chief Engineer,
World Bank Project
Page 81 of 86
O/o the E.P.C. (Civil), Odisha
Bhubaneswar



M/s RKD Construction

Chief Engineer
 World Bank Project, Odisha
 O/o the E.I.C. (Civil), Odisha
 Bhubaneswar
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SIGN POST ID	SCHEDULE OF SIGN POSTS		LOCATION			
	DESCRIPTION OF THE SIGN BOARD	CHAMBER	LL	RL	CR(L)	CR(R)
SP-11	T-Intersection	1896	✓			
		7155	✓			
		11658	✓			
		12750	✓			
		25133	✓			
		32552	✓			
		1996	✓			
		7255	✓			
		11758	✓			
		12850	✓			
		25233	✓			
		32652	✓			
		2488	✓			
		12740	✓			
		15796	✓			
		18654	✓			
		27077	✓			
		29451	✓			
		32468	✓			
		2588	✓			
		17840	✓			
		15896	✓			
		18754	✓			
		27177	✓			
		28622	✓			
		29561	✓			
		32568	✓			

SIGN POST ID	SCHEDULE OF SIGN POSTS		LOCATION			
	DESCRIPTION OF THE SIGN BOARD	CHAMBER	LL	RL	CR(L)	CR(R)
SP-12	Pedestrian Crossing	288	✓			
		773	✓			
		3038	✓			
		3408	✓			
		4838	✓			
		4963	✓			
		7720	✓			
		7958	✓			
		8073	✓			
		9772	✓			
		10070	✓			
		10008	✓			
		13078	✓			
		13658	✓			
		18934	✓			
		17200	✓			
		18613	✓			
		18703	✓			
		20463	✓			
		20770	✓			
		20878	✓			
		28133	✓			
		28463	✓			
		32003	✓			
		33088	✓			
		34248	✓			
		34570	✓			
		36573	✓			
		38650	✓			
		37143	✓			
		38570	✓			
		39570	✓			
		528	✓			
		633	✓			
		3088	✓			
		3468	✓			
		4898	✓			
		5022	✓			
		780	✓			
		8078	✓			
		811	✓			
		983	✓			
		10130	✓			
		10568	✓			
		13133	✓			
		13248	✓			
		15654	✓			
		17260	✓			
		18673	✓			
		18763	✓			
		20523	✓			
		20830	✓			
		21038	✓			
		28193	✓			
		28523	✓			
		33468	✓			
		34308	✓			
		34370	✓			
		34563	✓			
		36583	✓			
		36710	✓			
		37163	✓			
		38630	✓			
SP-13(a)	Staggered Intersection	-NIL-	✓			
SP-13(b)	Staggered Intersection	12750	✓			
SP-13(c)	Major Road Ahead	12830	✓			
SP-13(d)	Major Road Ahead	-NIL-	✓			
		100	✓			

SIGN POST ID	SCHEDULE OF SIGN POSTS		LOCATION			
	DESCRIPTION OF THE SIGN BOARD	CHAMBER	LL	RL	CR(L)	CR(R)
SP-14(a)	Y-Intersection	2981	✓			
		5520	✓			
		16392	✓			
		22605	✓			
		37489	✓			
		6365	✓			
		15119	✓			
		36411	✓			
		37030	✓			
		3041	✓			
SP-14(b)	Y-Intersection	5580	✓			
		16452	✓			
		22665	✓			
		37549	✓			
		6305	✓			
		13009	✓			
		36351	✓			
		36970	✓			
SP-14(d)	Cap In Median	-NIL-	✓			
SP-14(e)	Overhead Cable	7890	✓			
		21162	✓			
		21262	✓			
		26790	✓			
		26890	✓			
		27520	✓			
		27620	✓			

1. LL = LEFT LANE
2. RL = RIGHT LANE
3. CR(L) = CROSS ROAD LEFT
4. CR(R) = CROSS ROAD RIGHT
5. SIGN POST SHALL BE INSTALLED AT AN OFFSET DISTANCE OF 2M FROM THE EDGE OF CARRIAGE WAY
6. FOR DETAILS OF ROAD SIGNS REFER DWG.NOS FROM

PROJECT :-

ORISSA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE.

SCHEDULE OF SIGN POSTS
 BERHAMPUR TO TAPTAPANI (SH-17, KM 0 TO 41)

DRG NO. / ODRP/CEG/SH-17/SCH 02	REV. NO.	REV. RD	REV. B1	REV. B2
SH. NO. 45	DATE	PREPARED BY	CEP. LIA.	APPROVED
SCALE	NTS	CE. World Bank Project		



M/s. BMS Construction

Start	End	Length	Ref. Drawings
1905	1958	53	ORSP/CEG/CB
4390	4410	60	-0-
7720	7630	10	-0-
7145	8185	40	-0-
1266	11315	49	-0-
11711	11771	60	-0-
15173	13227	54	-0-
13702	15770	68	-0-
17826	17864	38	-0-
21706	21779	73	-0-
26545	26580	35	-0-
40740	40810	70	-0-
40990	41010	20	-0-
41630	41719	89	-0-
42370	42417	47	-0-

Start	End	Length	Ref. Drawings
1905	1958	53	ORSP/CEG/CB
4390	4410	60	-0-
8145	8190	35	-0-
11286	11315	49	-0-
11711	11771	60	-0-
15173	15227	54	-0-
13702	15770	68	-0-
17826	17894	68	-0-
21706	21779	73	-0-
39425	39452	27	-0-
41630	41719	89	-0-
42365	42417	52	-0-
42820	42905	85	-0-

HAND OF CURVE	START	END	CURVE LENGTH	RADIUS	SPACING	NO. ON THE OUTER	NO. ON THE INNER	TOTAL
Right	947.941	1214.078	266.137	875	45	6	3	15
Left	1598.69	1779.062	179.372	700	42	4	2	12
Left	2107.733	2182.189	74.456	1000	50	1	1	8
Right	2426.223	2623.586	497.366	800	45	11	6	23
Left	3316.951	3683.551	366.6	850	45	8	4	18
Right	4434.507	4482.261	47.754	200	20	2	1	10
Right	6520.948	6735.568	115.02	800	45	3	1	10
Right	7189.286	7244.265	54.979	200	20	3	1	10
Left	9540.024	9657.372	117.348	240	20	6	3	15
Right	9914.974	10096.191	181.217	600	38	5	2	13
Left	10876.174	10893.571	17.397	240	20	1	0	7
Right	12989.481	13352.391	362.93	1000	50	7	4	17
Left	13503.375	13641.791	138.416	1000	50	3	1	10
Left	20226.474	20389.84	163.366	800	45	4	2	11
Right	21186.949	21824.616	437.667	1000	50	9	4	19
Left	24125.015	24279.334	154.319	800	45	3	2	11
Right	24613.097	24634.125	21.028	90	8	3	1	10
Right	29171.848	29222.041	50.193	500	35	1	1	8
Left	29435.605	29506.844	71.239	400	30	2	1	10
Right	30655.852	30696.178	40.276	500	35	1	1	8
Right	33333.487	33380	46.513	800	45	1	1	8
Right	33907.555	33961.692	54.137	500	35	2	1	8
Left	34342.814	34472.866	130.052	400	30	4	2	13
Right	36289.188	36628.793	339.605	1000	50	7	3	16
Left	36928.568	37022.963	94.395	400	30	3	2	11
Right	37584.391	37646.485	62.094	500	35	2	1	9
Left	40304.168	40525.258	221.09	800	45	5	2	13
Right	40933.373	40989.182	55.809	1000	50	1	1	8
Left	41397.1	41395.581	36.481	120	12	3	2	11
Right	41576.87	41592.772	15.902	90	8	2	1	9
Left	41778.402	41892.382	113.98	400	30	4	2	12
Right	42167.21	42364.884	197.674	200	20	10	5	21
Left	42486.719	42517.543	30.824	200	20	2	1	8

TOTAL = >>>

391

NOTE:

1. ROAD DELINEATORS SHALL BE PROVIDED AS PER THE GUIDELINES IN IRC:79-1981
2. FOR THE DETAILS OF ROAD DELINEATORS REFER DWG NO OSRP/CEG/RO

PROJECT :-

ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE.

SCHEDULE OF GUARD POSTS,
& DELINEATORS

BERHAMPUR TO TAPTAPANI (SH-17, KM 0 TO 41)

DRG NO	OSRP/CEG/SH-17/SCH 04	REV. NO	REV. BY	APPROVED
SH. NO.	47	DATE	REV. RO	CE. WWD Bank Projects
SCALE	NTS	REV. RO	CE. WWD Bank Projects	

Chief Engineer
World Bank Projects, Odisha
EMPLOYER
Chief Engineer
World Bank Project
O/o the E.I.C. (Civil), Odisha
Bhubaneswar.

SCHEDULE OF PEDESTRIAN CROSSING

School Zone	CHAINAGE	7750	803	760
Bus Boys	3068	3438	4868	
	4993	7988	8103	
	9803	10538	13103	
	18643	18733	21008	
	20493	24450	28453	
	32333	33118	34278	
	34563	36553	37153	

M/s RKB Construction
CONTRACTOR



NOTE:-
1. FOR DETAILS OF PEDESTRIAN CROSSING REFER ROAD MARKINGS
2. FOR DETAILS OF R.R.P.Ms AT PEDESTRIAN CROSSING REFER STANDARD DRAWINGS

SCHEDULE OF RR.PMS (RAISED RETROREFLECTIVE PAVEMENT MARKER)

Sl. No.	Start	End	Length	1. R.R.P.Ms
1	0.000	835.000	835	Both Sides
2	860.000	7100.000	300	Both Sides
3	2400.000	2650.000	250	Both Sides
4	2990.000	3485.000	495	Both Sides
5	4410.000	4910.000	500	Both Sides
6	9755.000	10945.000	1190	Both Sides
7	7025.000	7770.000	745	Both Sides
8	7745.000	7970.000	225	Both Sides
9	8200.000	8750.000	550	Both Sides
10	8945.000	10900.000	1955	Both Sides
11	11695.000	11900.000	205	Both Sides
12	12775.000	13600.000	825	Both Sides
13	15645.000	15800.000	155	Both Sides
14	17700.000	17400.000	300	Both Sides
15	18255.000	19100.000	845	Both Sides
16	20600.000	20900.000	300	Both Sides
17	27000.000	29100.000	2100	Both Sides
18	29200.000	29400.000	200	Both Sides
19	31960.000	33300.000	1340	Both Sides
20	34190.000	34650.000	460	Both Sides
21	36700.000	37200.000	500	Both Sides

SCHEDULE OF RR.PMS ALONG CURVES

Sl. No.	Curve Start Length of R.P.M
1	4460
2	7200
3	8200
4	9800
5	10980
6	24600
7	25600

RR.PMS AT BRIDGE LOCATIONS
NO. OF BRIDGES = 10 Nos
NO. OF SUBE CULVERTS WIDENING = 6 Nos
LENGTH OF BRIDGES @ 50m EACH
TOTAL LENGTH OF RR.PMS = 30416+5200m

RR.PMS NEAR RUMBLE STRIP ON MAIN CARRIAGEWAY

Sl. No.	Start	End	Length
1	1000	1100	100
2	1100	1200	100
3	1200	1300	100
4	1300	1400	100
5	1400	1500	100
6	1500	1600	100
7	1600	1700	100
8	1700	1800	100
9	1800	1900	100
10	1900	2000	100
11	2000	2100	100
12	2100	2200	100
13	2200	2300	100
14	2300	2400	100
15	2400	2500	100
16	2500	2600	100
17	2600	2700	100
18	2700	2800	100
19	2800	2900	100
20	2900	3000	100
21	3000	3100	100
22	3100	3200	100
23	3200	3300	100
24	3300	3400	100
25	3400	3500	100
26	3500	3600	100
27	3600	3700	100
28	3700	3800	100
29	3800	3900	100
30	3900	4000	100
31	4000	4100	100
32	4100	4200	100
33	4200	4300	100
34	4300	4400	100
35	4400	4500	100
36	4500	4600	100
37	4600	4700	100
38	4700	4800	100
39	4800	4900	100
40	4900	5000	100
41	5000	5100	100
42	5100	5200	100
43	5200	5300	100
44	5300	5400	100
45	5400	5500	100
46	5500	5600	100
47	5600	5700	100
48	5700	5800	100
49	5800	5900	100
50	5900	6000	100
51	6000	6100	100
52	6100	6200	100
53	6200	6300	100
54	6300	6400	100
55	6400	6500	100
56	6500	6600	100
57	6600	6700	100
58	6700	6800	100
59	6800	6900	100
60	6900	7000	100
61	7000	7100	100
62	7100	7200	100
63	7200	7300	100
64	7300	7400	100
65	7400	7500	100
66	7500	7600	100
67	7600	7700	100
68	7700	7800	100
69	7800	7900	100
70	7900	8000	100
71	8000	8100	100
72	8100	8200	100
73	8200	8300	100
74	8300	8400	100
75	8400	8500	100
76	8500	8600	100
77	8600	8700	100
78	8700	8800	100
79	8800	8900	100
80	8900	9000	100
81	9000	9100	100
82	9100	9200	100
83	9200	9300	100
84	9300	9400	100
85	9400	9500	100
86	9500	9600	100
87	9600	9700	100
88	9700	9800	100
89	9800	9900	100
90	9900	10000	100

LENGTH OF RR.PMS AT BUILT UP AREAS

Sl. No.	Start	End	Length	1. R.R.P.Ms
1	0.000	835.000	835	Both Sides
2	860.000	7100.000	300	Both Sides
3	2400.000	2650.000	250	Both Sides
4	2990.000	3485.000	495	Both Sides
5	4410.000	4910.000	500	Both Sides
6	9755.000	10945.000	1190	Both Sides
7	7025.000	7770.000	745	Both Sides
8	7745.000	7970.000	225	Both Sides
9	8200.000	8750.000	550	Both Sides
10	8945.000	10900.000	1955	Both Sides
11	11695.000	11900.000	205	Both Sides
12	12775.000	13600.000	825	Both Sides
13	15645.000	15800.000	155	Both Sides
14	17700.000	17400.000	300	Both Sides
15	18255.000	19100.000	845	Both Sides
16	20600.000	20900.000	300	Both Sides
17	27000.000	29100.000	2100	Both Sides
18	29200.000	29400.000	200	Both Sides
19	31960.000	33300.000	1340	Both Sides
20	34190.000	34650.000	460	Both Sides
21	36700.000	37200.000	500	Both Sides

RR.PMS AT SPUR ROAD JUNCTIONS

Junction No.	Chainage	Type - A	Type - B
1	18704	LHS/RHS	LHS/RHS
2	23570	LHS	LHS
3	10378	LHS	RHS
4	36361	RHS	RHS

Junction No.	Chainage	Type - A	Type - B
1	18704	LHS/RHS	LHS/RHS
2	23570	LHS	LHS
3	10378	LHS	RHS
4	36361	RHS	RHS

NOTE:-
IN GENERAL RR.PMS SHALL BE PROVIDED AT THE FOLLOWING SPACINGS.
STRAIGHT SECTIONS:-
- SPACING 025M C/C (EDGE LINE RED MARKER)
- SPACING 09M C/C (CENTRE LINE WHITE MARKER)
CURVED SECTIONS
- SPACING 09M C/C (EDGE LINE RED MARKER)
- SPACING 06M C/C (CENTRE LINE WHITE MARKER)

SCHEDULE OF EXTRA WIDENING

START	END	LENGTH	WIDENING IN MT	SIDE
4134.507	4482.261	48	0.300	Both side
7189.286	7244.285	55	0.300	Both side
8222.134	8235.371	13	0.300	Both side
9540.024	9857.371	117	0.300	Both side
10876.174	10993.571	117	0.300	Both side
24613.097	24634.124	21	0.450	Both side
25389.072	25399.815	11	0.300	Both side
41357.000	41363.561	36	0.300	Both side

NOTE:
1. EXTRA WIDENING HAS BEEN DONE AS PER THE GUIDELINES DETAILED IN IRC:73-1980
2. WIDENING SHALL BE DONE EQUALLY ON BOTH THE INNER AND OUTER CURVES
3. THE SLOPE OF THE CARRIAGEWAY SHALL EXTEND IN THE WIDENING SECTIONS

Chief Engineer
World Bank Projects, Odisha
EMPLOYER

Chief Engineer
World Bank Projects
to the E.I.C.(Civil), Odisha
Rhubaneswar.

SCHEDULE OF EXTRA WIDENING, RAISED RETROREFLECTIVE RUMBLE STRIP
PEDESTRIAN CROSSINGS & RR.PMS
BERHAMPUR TO TAPTAPANI (SH-17, KM 0 TO 41)

DRG. NO. DSRRP/CEC/SH-17/561/05	REV. NO.	REV. BY	REV. DATE	REV. DATE	REV. DATE
SH. NO. 43	43	DATE	REV	REV	REV
SCALE	NTS			CE	CE

ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE.

SCHEDULE FOR PAVEMENT COMPOSITION

SL.No.	Prop chainage		Length in KM	Thickness Design (IRC-37) Crust Details Over Existing Pavement				Sub grade	Total Thickness
	From	To		Surface Course	Base	Sub Base			
1	0.000	25.170	25.170	BC	DBM	WMM1	WMM2	GSB 1	500
2	25.170	36.150	10.980	40	75	100	150	200	1065
3	36.150	40.180	4.030	40	50	100	150	200	215
4	40.180	41.000	820.0	40	75	100	150	200	1625
4	40.180	41.000	820.0	40	50	100	150	200	625

DETAILED PAVEMENT SCHEDULE FOR BERHAMPUR TO TAPTAPANI (SH-17)

TCS Reference for Berhampur - Taptapani Road									
Chainage	Length in Mtr.		TCS No	Chainage		Length in Mtr.	TCS No	Sub grade	
	From	To		From	To			Sub Base	Sub grade
0	820	820	4	20600	20920	320	5		
820	1600	780	8	20920	23230	2310	9		
1600	1680	80	5	23230	25100	1870	20		
1680	2100	420	4	25100	26650	1550	3		
2100	2400	300	8	26650	26800	150	6		
2400	2600	200	4	26800	26880	80	2		
2600	3090	490	7	26880	27100	220	18		
3090	3480	390	4	27100	27380	280	1		
3480	4080	600	8	27380	27630	250	3		
4080	4410	330	9	27630	27850	220	2		
4410	4900	490	4	27850	28030	180	3		
4900	5340	440	7	28030	28100	70	2		
5340	6880	1540	9	28100	28200	100	1		
6880	7020	140	7	28200	28420	220	4		
7020	7270	250	4	28420	28750	330	1		
7270	7740	470	8	28750	29200	450	3		
7740	7940	200	5	29200	29430	230	1		
7940	8200	260	8	29430	31960	2530	3		
8200	8380	180	4	31960	32050	90	5		
8380	9840	1460	5	32050	33330	1280	4		
9840	10600	760	4	33330	33600	270	3		
10600	11660	1060	9	33600	34100	500	1		
11660	11900	240	5	34100	34600	500	4		
11900	12920	1020	8	34600	34650	50	5		
12920	13690	770	5	34650	34870	220	2		
13690	13980	290	8	34870	35650	780	3		
13980	15640	1660	9	35650	36290	640	2		
15640	15880	240	4	36290	36950	660	4		
15880	18230	2350	9	36950	37200	250	5		
18230	19100	870	4	37200	37530	330	2		
19100	20600	1500	9	37530	37850	320	18		
				37850	41000	3150	2		

Note:

1. The pavement design has been based on IRC : 37- 2001 & IRC:81 - 1997
2. The Subgrade CBR Value shall not be <10
3. The typical crosssection applicable for different sections are given in "Standard drawing set"

[Signature]
M/s BKD Construction



[Signature]
Chief Engineer
World Bank Projects, Odisha
EMPLOYER
Chief Engineer
World Bank Project
Page 66 of 118
Bhubaneswar.

PROJECT :-

ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

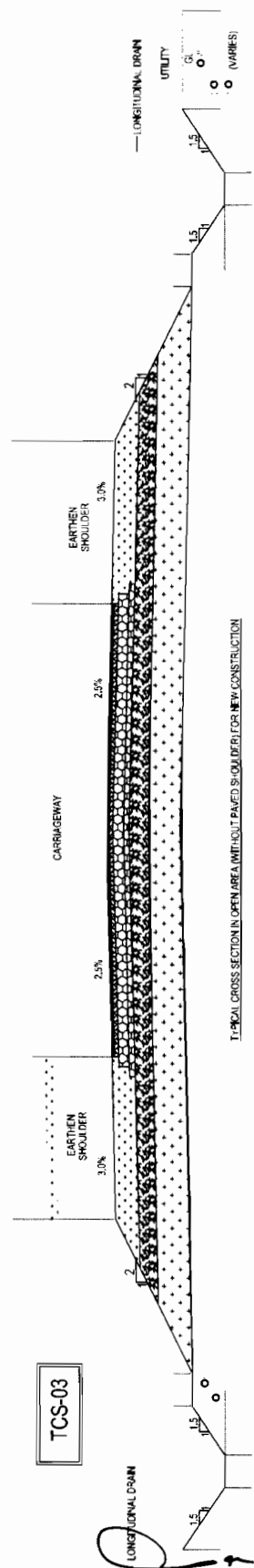
PAVEMENT SCHEDULE

BERHAMPUR TO TAPTAPANI (SH-17, KM 0 TO 41)

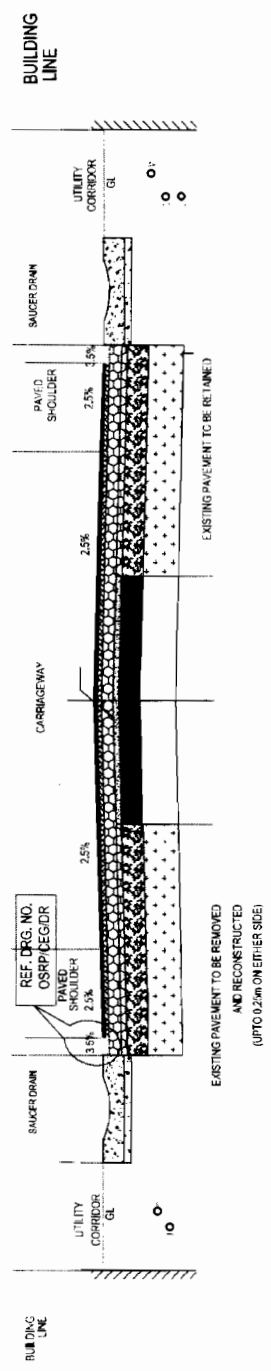
DRC NO. : OSRP/CEC/SH-17/SCM 07	REV. NO. : 30	DATE :	REV. BY :	REV. DATE :	REV. BY :	REV. DATE :
SCALE :	NTS			CEC LIA. :	REV. BY :	REV. DATE :
					CEC LIA. :	REV. DATE :

CE, World Bank Projects

[Signature]
 M/s R.K.D. CONSTRUCTION
 CONTRACTOR
 R.K.D. CONSTRUCTION PVT. LTD.
 Bhubaneswar



TCS-04



LEGEND

1.5%	2.5%	3.5%	4.5%	5.5%	6.5%	7.5%	8.5%	9.5%	10.5%
1.5%	2.5%	3.5%	4.5%	5.5%	6.5%	7.5%	8.5%	9.5%	10.5%
1.5%	2.5%	3.5%	4.5%	5.5%	6.5%	7.5%	8.5%	9.5%	10.5%
1.5%	2.5%	3.5%	4.5%	5.5%	6.5%	7.5%	8.5%	9.5%	10.5%
1.5%	2.5%	3.5%	4.5%	5.5%	6.5%	7.5%	8.5%	9.5%	10.5%
1.5%	2.5%	3.5%	4.5%	5.5%	6.5%	7.5%	8.5%	9.5%	10.5%
1.5%	2.5%	3.5%	4.5%	5.5%	6.5%	7.5%	8.5%	9.5%	10.5%
1.5%	2.5%	3.5%	4.5%	5.5%	6.5%	7.5%	8.5%	9.5%	10.5%
1.5%	2.5%	3.5%	4.5%	5.5%	6.5%	7.5%	8.5%	9.5%	10.5%
1.5%	2.5%	3.5%	4.5%	5.5%	6.5%	7.5%	8.5%	9.5%	10.5%

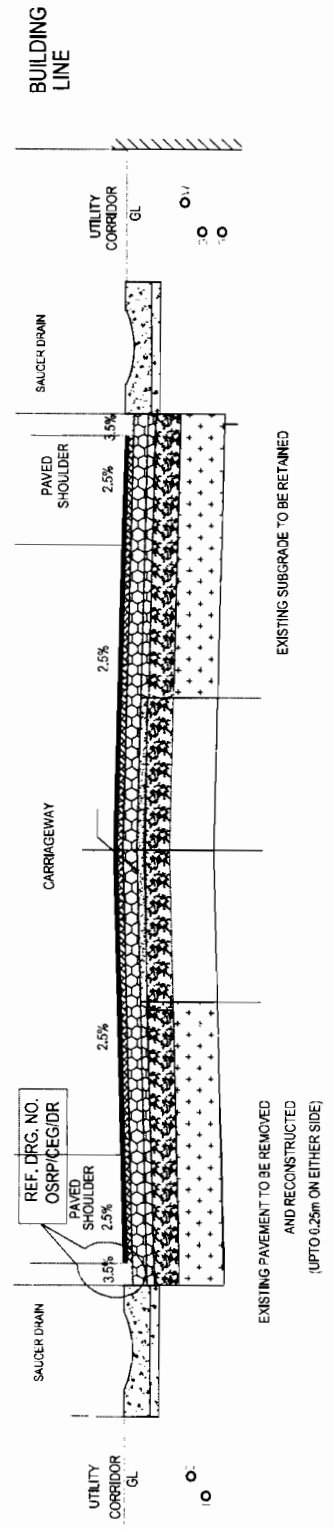
TYPICAL CROSS-SECTION
 TCS - 03 & TCS - 04

PROJECT:-
 ORISSA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE

DRG NO.	ORISSA STATE ROAD PROJECT	REV. NO.	05	DATE	FEB. 2012	REV	R1	PREPARED BY	EE/PMU	REV. BY	EE/PMU	APPROVED	CE, World Bank Projects.
SH. NO.	05	SCALE	NTS										

[Signature]
 Chief Engineer
 World Bank Projects, Odisha
 EMPLOYER
 Chief Engineer
 World Bank Project
 Page 63 of 135ii), Odisha
 Bhubaneswar.

TCS-05

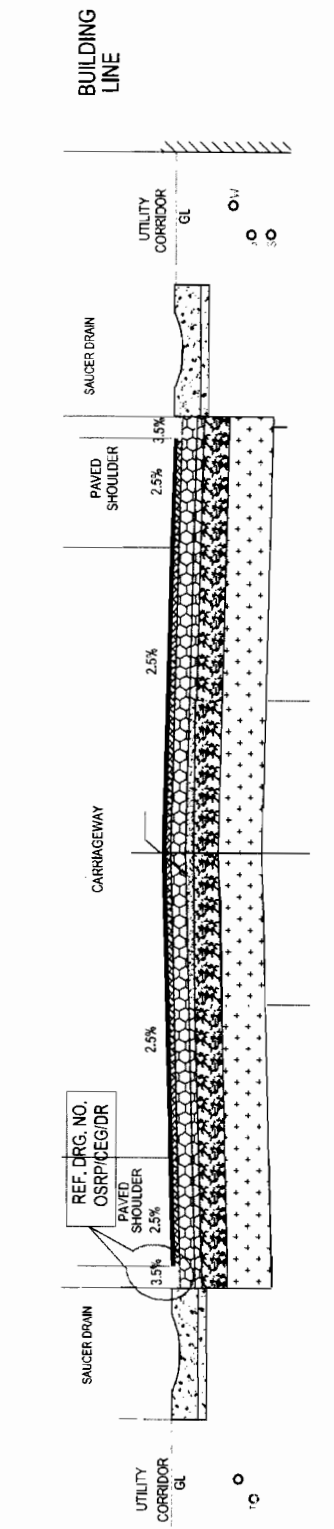


TYPICAL CROSS SECTION IN BUILT-UP AREA FOR RECONSTRUCTION \ WIDENING

LEGENDS

1. F.R.C.	1. F.R.C.	1. F.R.C.	1. F.R.C.
2. D.M.	2. D.M.	2. D.M.	2. D.M.
3. C.M.	3. C.M.	3. C.M.	3. C.M.
4. C.P.	4. C.P.	4. C.P.	4. C.P.
5. SUBGRADE	5. SUBGRADE	5. SUBGRADE	5. SUBGRADE

TCS-06



PROJECT:-

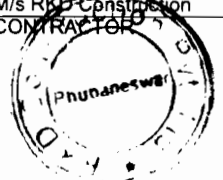
ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

TYPICAL CROSS-SECTION
TCS - 05 & TCS - 06

DRG NO.	OSRP/CE/CA/06	DATE	FEB. 2012	REV	R1	SCALE	NIS
SH. NO.	05	PREPARED BY	CEC LIA.	REV. R1	EL/PAU	APPROVED	CE, World Bank Projects.

[Signature]

M/s RKB Construction
COMPTON

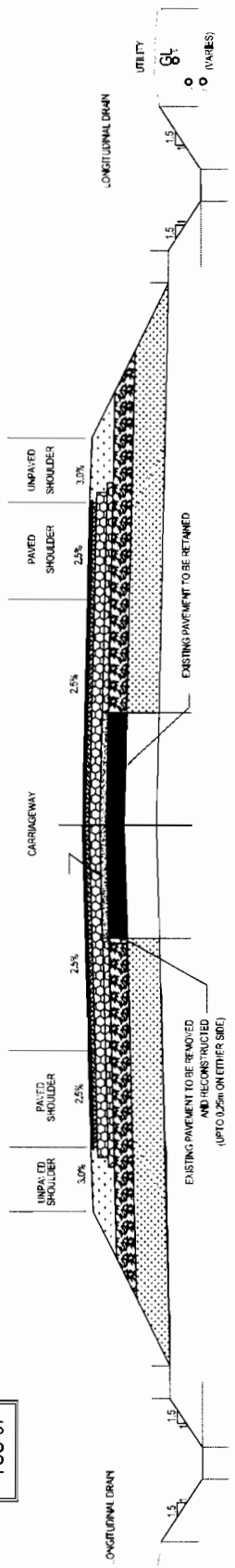


Chief Engineer
World Bank Projects, Odisha

World Bank Project
o/o the E.I.C. (Civil), Odisha
Bhubaneswar.

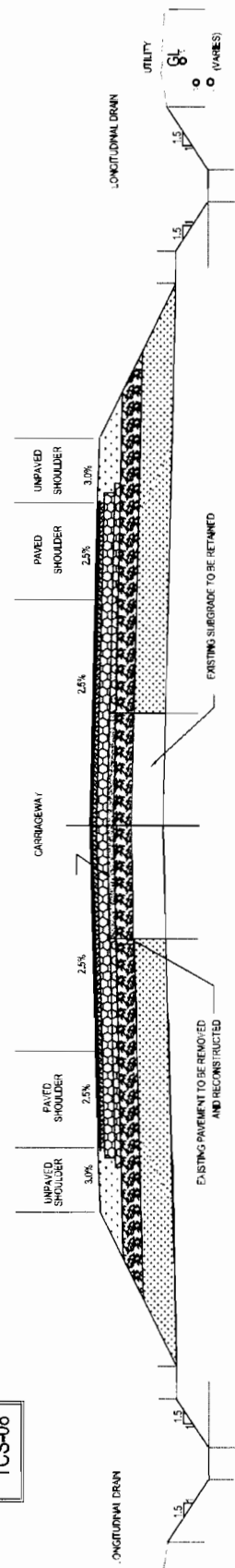
[Signature]

TCS-07



TYPICAL CROSS SECTION IN OPEN AREA (WITH PAVED SHOULDER) FOR OVERLAY / WIDENING

TCS-08



TYPICAL CROSS SECTION IN OPEN AREA (WITH PAVED SHOULDER) FOR RECONSTRUCTION / WIDENING



TYPICAL CROSS-SECTION
TCS - 07, TCS - 08

PROJECT:-

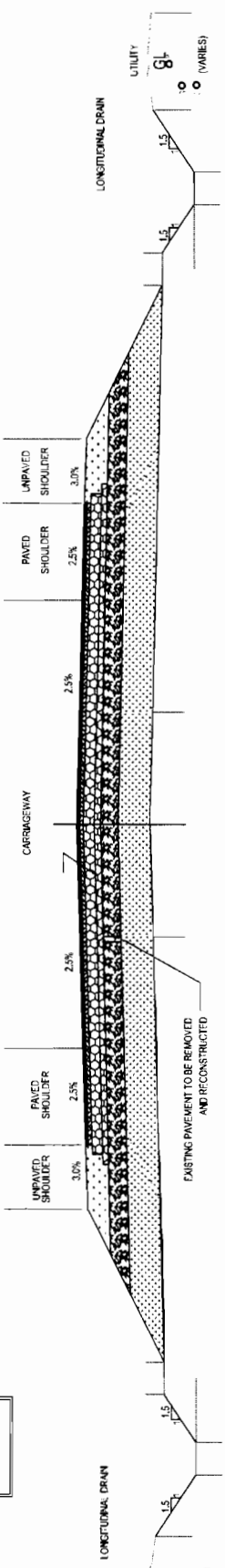
ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

DRG NO. / CORRIGENDUM / A.M.	REV. NO.	REV. DATE	REV. BY	REV. BY	APPROVED
SH. NO. / 05	05	FEB, 2012	REV	R1	CE, World Bank Projects.
SCALE	NTS				

Chief Engineer
World Bank Projects, Odisha

Chief Engineer
World Bank Project
Odisha (Civil), Odisha
Bhubaneswar.

TCS-09

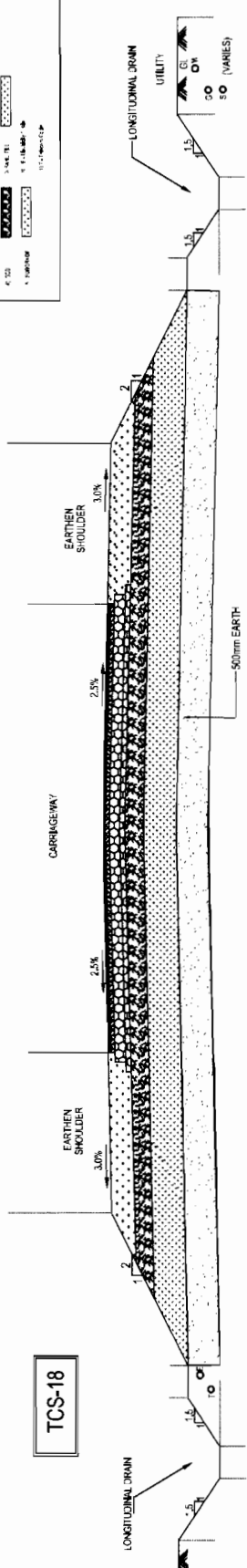


TYPICAL CROSS SECTION IN OPEN AREA WITH PAVED SHOULDER FOR NEW CONSTRUCTION

LEGENDS

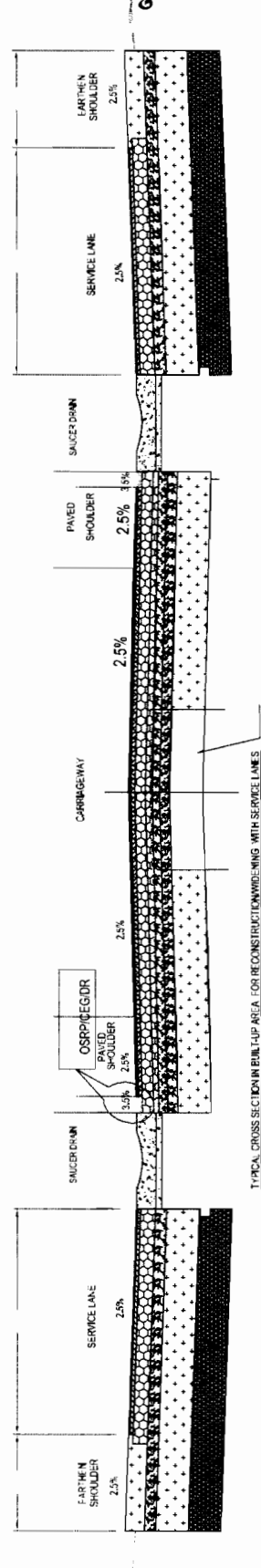
1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
[Symbol]	[Symbol]	[Symbol]	[Symbol]	[Symbol]	[Symbol]	[Symbol]	[Symbol]	[Symbol]	[Symbol]
1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0

TCS-18



TYPICAL CROSS SECTION IN OPEN AREA WITHOUT PAVED SHOULDER FOR NEW CONSTRUCTION IN EXPANSE CLAYS

TCS-20



TYPICAL CROSS SECTION IN BUILD UP AREA FOR RECONSTRUCTION WIDENING WITH SERVICE LANES

PROJECT:-

ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

TYPICAL CROSS-SECTION
TCS - 09, TCS - 18 & TCS - 20

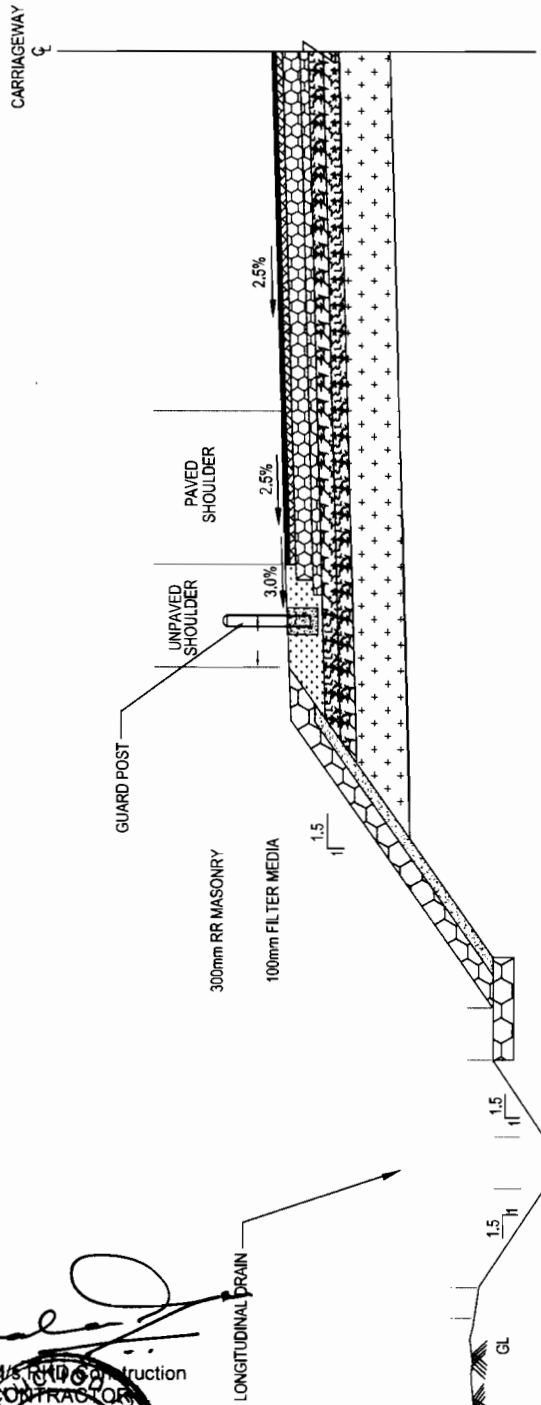
DRG NO. (COMPONENTS) 509 (A, D)	REV. NO.	DATE	REV	REV	REV	REV	REV
SH. NO. 05	05	FEB. 2012					
SCALE	NTS						
REV. NO. PREPARED BY: CCS UN.	REV. NO. PREPARED BY: E2/PAU	REV. NO. APPROVED: CE, World Bank Projects.					



Chief Engineer
World Bank Projects, Odisha
EMPLOYER
Chief Engineer
World Bank Project
O/o the E.I.C.(Civil), Odisha
Bhubaneswar.

SCHEDULE OF ROAD PROTECTION WORKS

Sl. No.	Location	Length in Mtr. 4 - Sides
1	1+915	20
2	4+400	20
3	11+270	20
4	11+660	20
5	15+185	20
6	15+680	20
7	17+900	20
8	21+850	20
9	29+270	20
10	29+570	20



HIGH EMBANKMENT PROTECTION WORK WITH STONE PITCHING

LEGEND

CL	Center Line
GL	Ground Level
CL	Center Line
GL	Ground Level
CL	Center Line
GL	Ground Level
CL	Center Line
GL	Ground Level

[Signature]
 M/s. [Name] Construction
 CONTRACTOR

[Signature]
 Chief Engineer
 World Bank Projects, Odisha
 EMPLOYER
 Chief Engineer
 World Bank Project
 O/o the E.I.C. (Civil), Odisha
 Bhubaneswar.

PROJECT:-

**ORISSA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE**

TYPICAL SLOPE PROTECTION WORK

DRG NO.	OSR/PC/00/01
SH. NO.	10
DATE	FEB. 2012
REV	R1
SCALE	NTS
REV. NO.	REV. R1
PREPARED BY	CEJ/PAU
APPROVED	CE, World Bank Projects

SCHEDULE OF SAUCER DRAIN

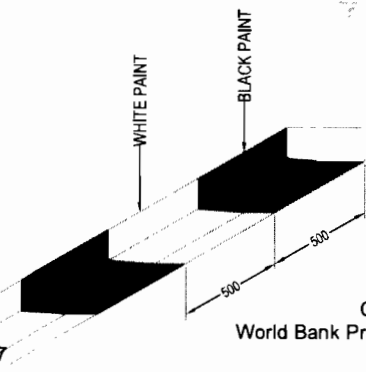
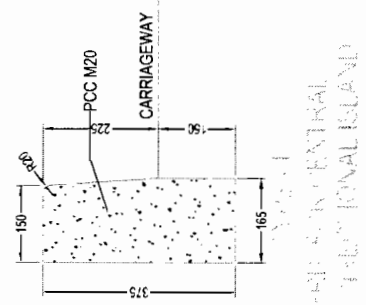
Sl. No.	Chainage		I.H.S/RHS
	Start	End	
1	0.000	835.000	Both Side
2	1600.000	2100.000	Both Side
3	2600.000	2600.000	Both Side
4	3090.000	3480.000	Both Side
5	410.000	4910.000	Both Side
6	5120.000	10545.000	Both Side
7	1085.000	7270.000	Both Side
8	1715.000	7970.000	Both Side
9	1800.000	8380.000	Both Side
10	9840.000	10600.000	Both Side
11	11665.000	11900.000	Both Side
12	1725.000	13690.000	Both Side
13	15645.000	15980.000	Both Side
14	17200.000	17450.000	Both Side
15	18735.000	19100.000	Both Side
16	20600.000	20920.000	Both Side
17	23200.000	25100.000	Both Side
18	28200.000	28420.000	Both Side
19	31960.000	33330.000	Both Side
20	34100.000	34650.000	Both Side
21	36200.000	37200.000	Both Side

Total Line Drain Length = > 12450 x 2 = 24900



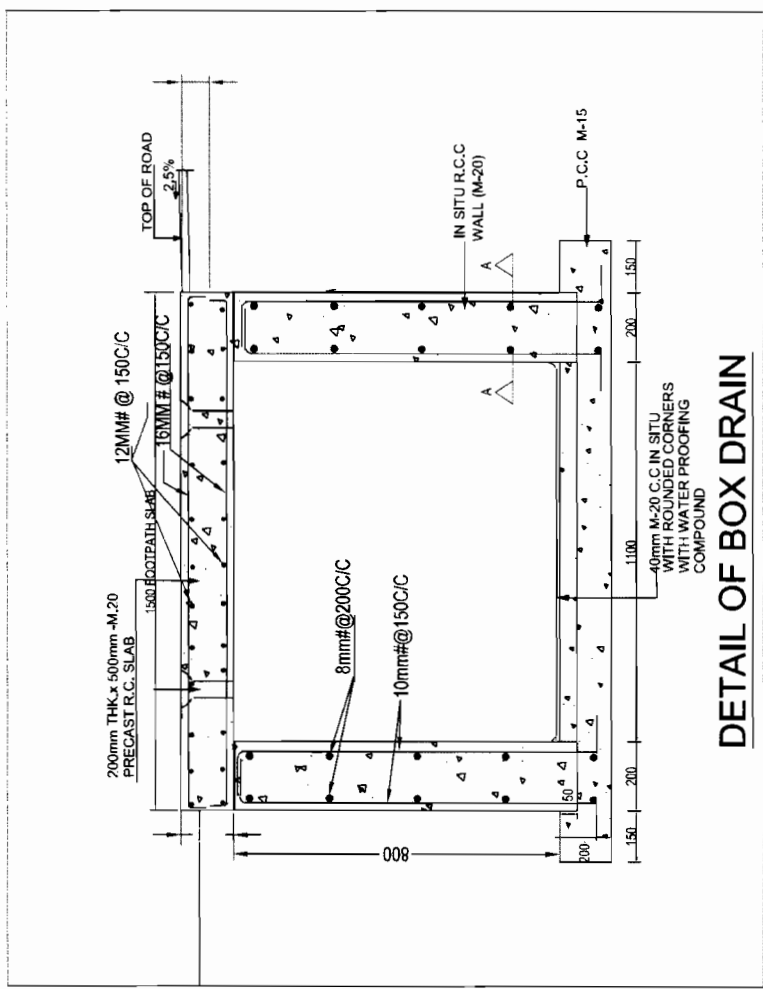
Page 147

Annexure - II

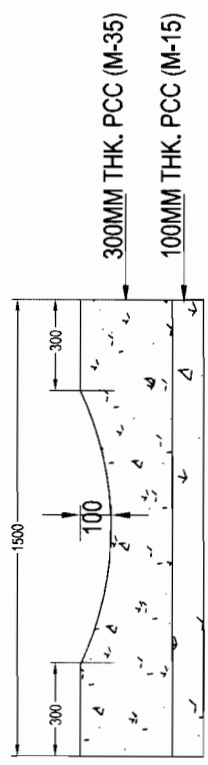


Chief Engineer
World Bank Projects, Odisha
EMPLOYER

Chief Engineer,
World Bank Project
O/o the E.I.C.(Civil), Odisha
Bhubaneswar.



DETAIL OF BOX DRAIN



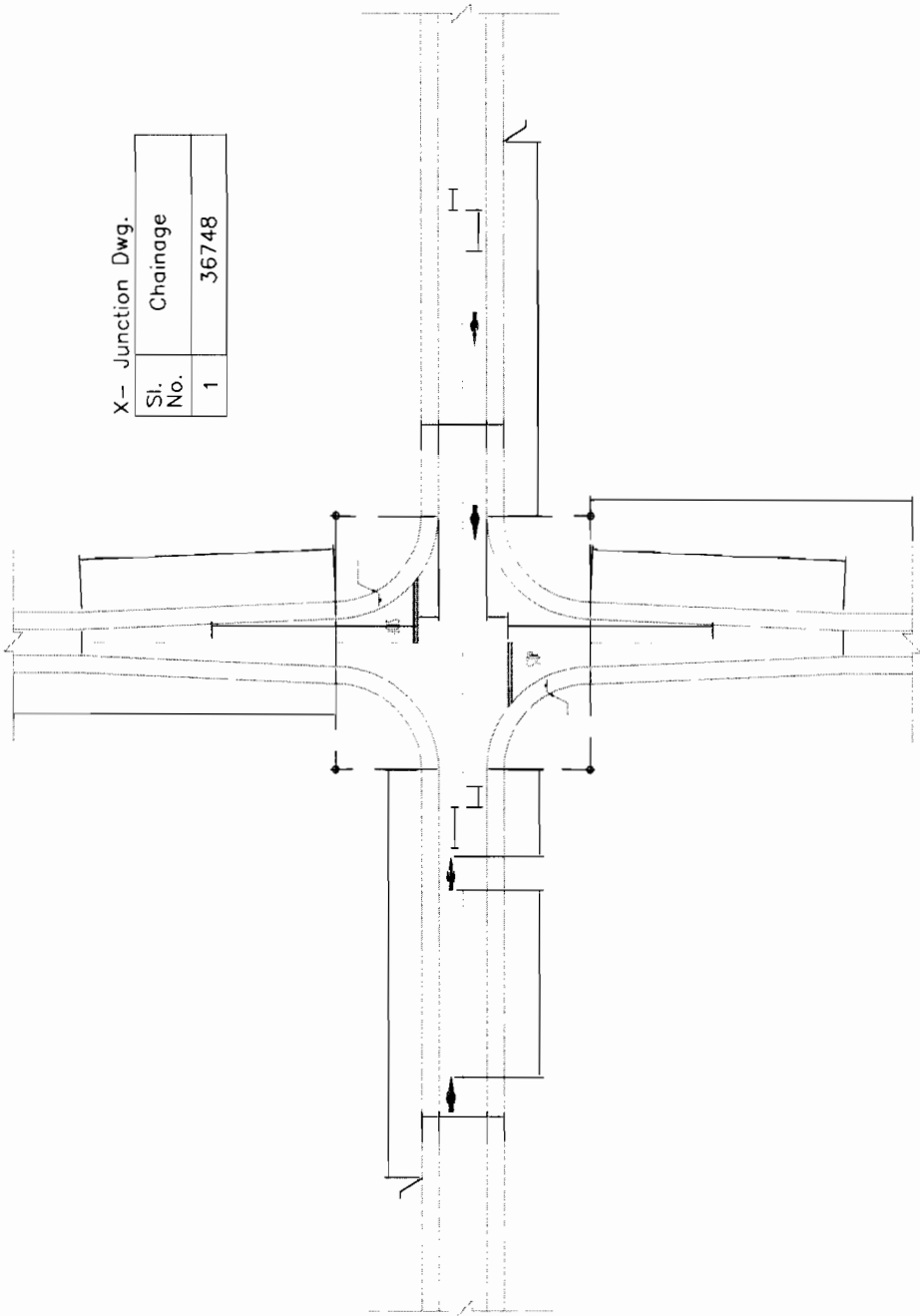
PRECAST SAUCER DRAIN

PROJECT:-

**ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE**

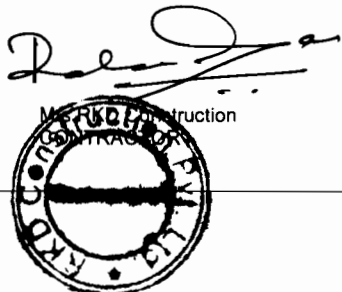
**STANDARD DRAWINGS
DETAILS OF DRAIN AND KERB**


DRG NO. 08/REG/04	REV. NO. 16	DATE	REV	R1	APPROVED
SH. NO.	16	DATE	REV	R1	PREPARED BY: EE/PMU
SCALE	NTS				CHECKED BY: CEC LIA.
CC. World Bank Projects					



X- Junction Dwg.

Sl. No.	Chainage
1	36748



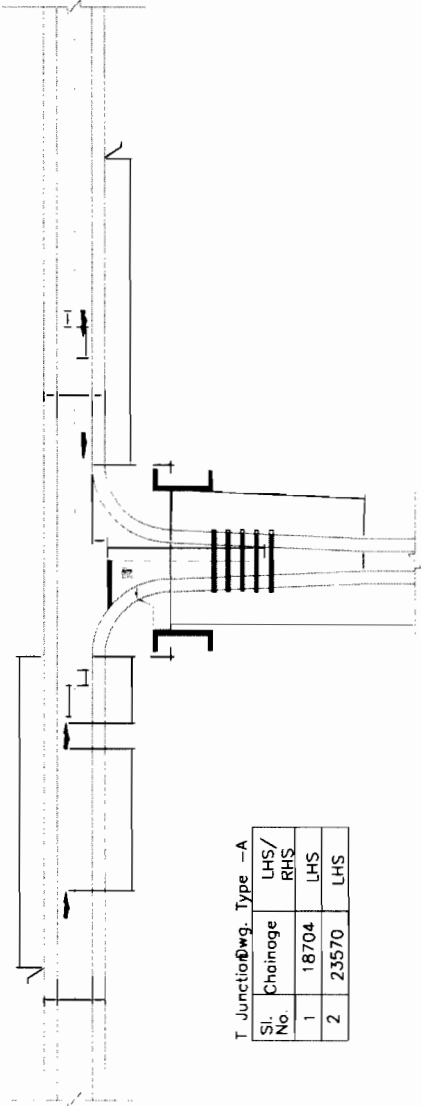

 Chief Engineer
 World Bank Projects, Odisha
EMPLOYER
 Chief Engineer,
 World Bank Project
 O/o the E.I.C.(Civil), Odisha
 Bhubaneswar.

PROJECT:-

ORISSA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE

STANDARD DRAWINGS
TYPICAL 4-LEGGED INTERSECTION WITH
WITH SINGLE LANE BT ROAD

DRG NO.	OSR/CEG/01/01	REV. NO	REV. R1	APPROVED
SH. NO.	16	DATE	PREPARED BY	CE/PMU
SCALE			CEG LIA.	CE, World Bank Projects
			REV	
			R1	
			NTS	

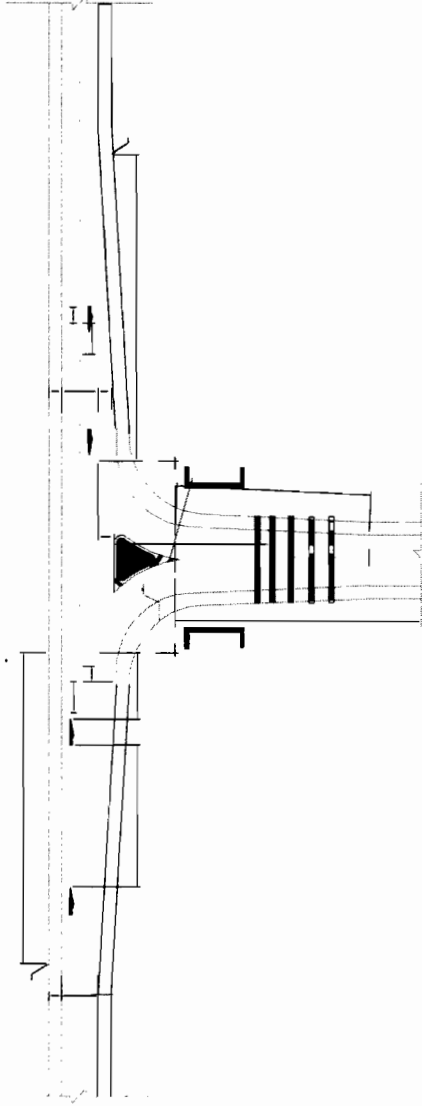


T Junction@wg. Type -A

Sl. No.	Chainage	LHS/RHS
1	18704	LHS
2	23570	LHS

T Junction@wg. Type -B

Sl. No.	Chainage	LHS/RHS
1	1946	LHS
2	2538	RHS
3	7050	RHS
4	7205	LHS
5	11708	LHS
6	11710	RHS
7	12800	LHS
8	12810	RHS
9	15846	RHS
10	17410	RHS
11	28572	LHS
12	29511	RHS
13	32518	RHS
14	32602	LHS



STANDARD DRAWINGS
TYPICAL T-JUNCTION
WITH SINGLE LANE BT ROAD

PROJECT:-
ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

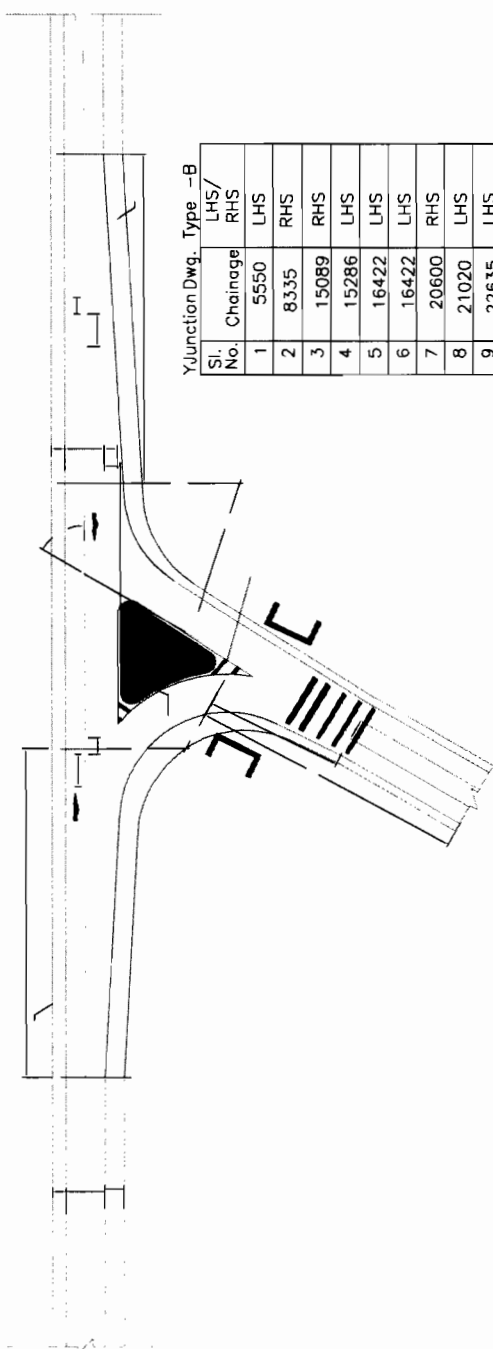
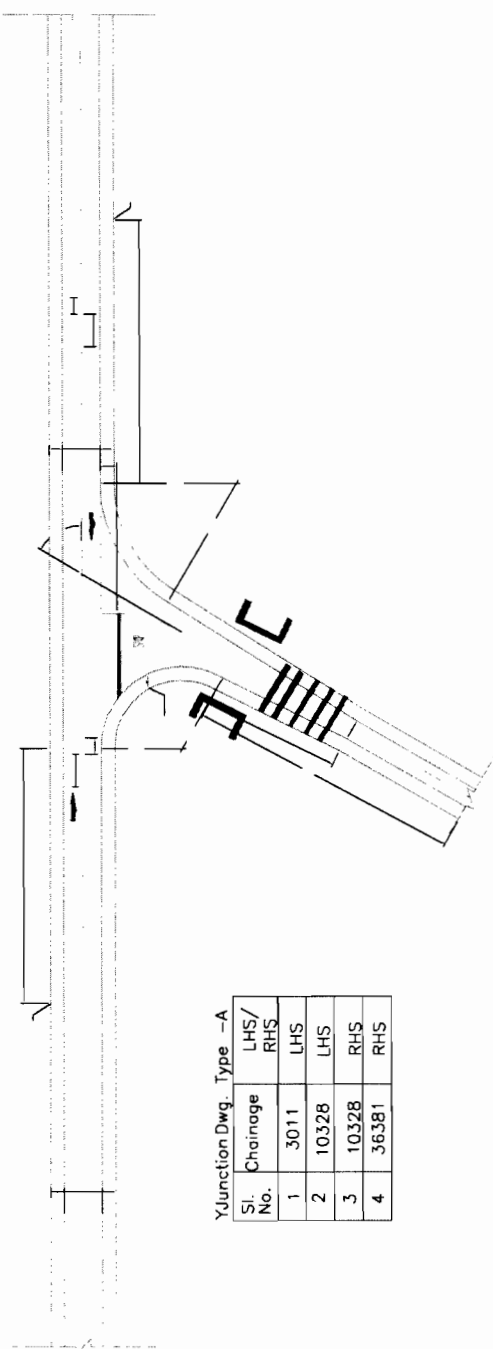
DRG NO.	DATE	REV	R1	APPROVED
SH. NO.	19			EE/PMU
SCALE				CE, World Bank Projects.

[Signature]

M/s RKD Construction
KODAKHOLI, Bhubaneswar



[Signature]
Chief Engineer
World Bank Projects, Odisha
EMPLOYER



[Signature]

M/s RKD Construction
CONTRACTOR



[Signature]
Chief Engineer
World Bank Projects, Odisha
EMPLOYER

PROJECT:-

ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

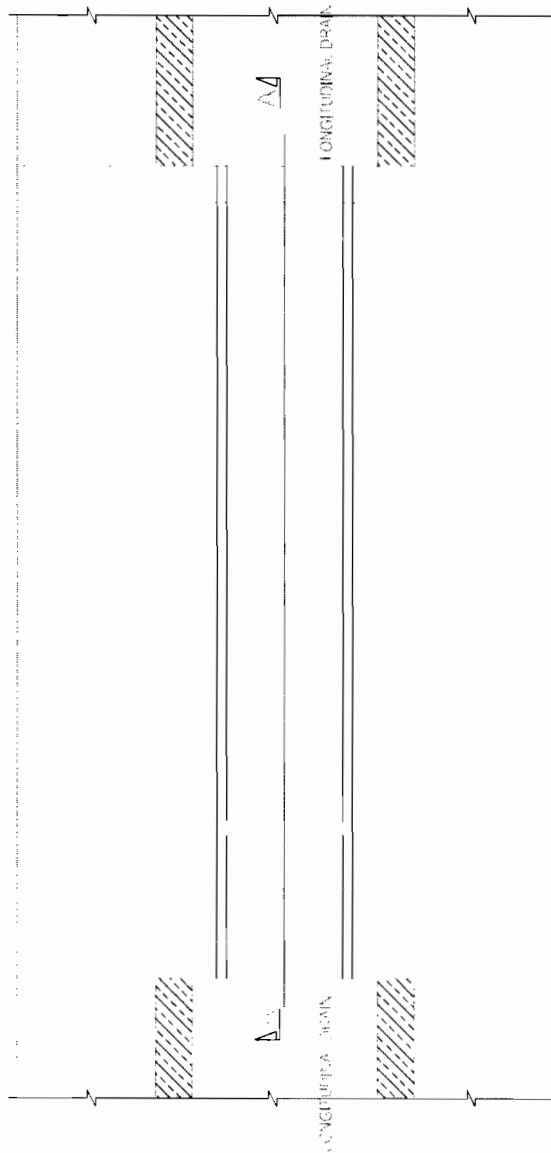
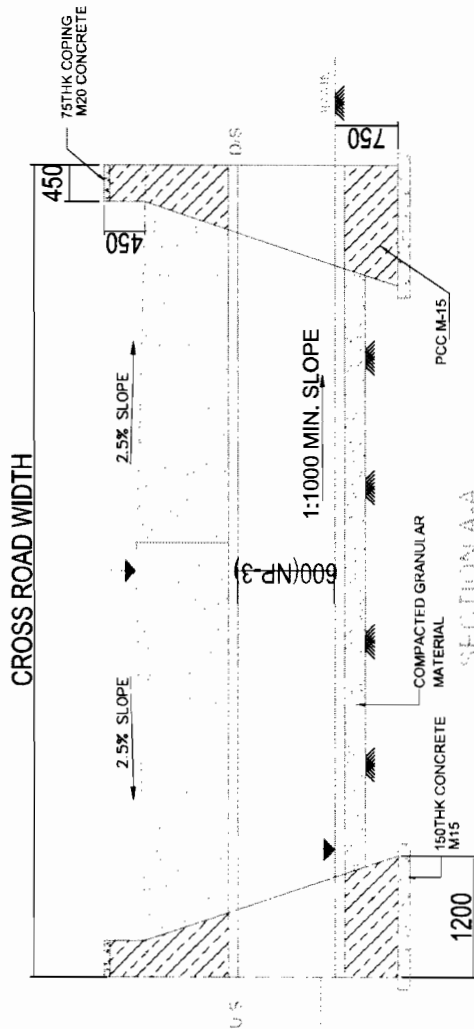
**STANDARD DRAWINGS
TYPICAL Y- JUNCTION WITH
SINGLE LANE BT ROAD/EARTHEN ROAD**

DRG NO.	OSR/REG/103	REV. NO	REV. R1	APPROVED
SH. NO.	20	DATE	REV	PREPARED BY : EE/PMU
SCALE			R1	CE, World Bank Projects.
			NTS	

SCHEDULE OF CROSS ROAD CULVERTS

T Junction Dwg. Type -B		Y Junction Dwg. Type -B	
Sl. No.	Chainage	LHS/RHS	Type
1	1946	LHS	LHS
2	2538	RHS	LHS
3	7050	RHS	RHS
4	7205	LHS	RHS
5	11708	LHS	RHS
6	11710	RHS	LHS
7	12800	LHS	LHS
8	12810	RHS	LHS
9	15846	RHS	RHS
10	17410	RHS	LHS
11	28572	LHS	LHS
12	29511	RHS	LHS
13	32518	RHS	RHS
14	32602	LHS	LHS

T Junction Dwg. Type -A		Y Junction Dwg. Type -A	
Sl. No.	Chainage	LHS/RHS	Type
1	18704	LHS	LHS
2	23570	LHS	LHS
1	3011	LHS	RHS
2	10328	LHS	LHS
3	10328	RHS	RHS
4	36381	RHS	RHS



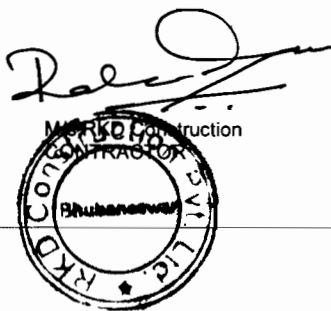
TYPICAL PLAN FOR PIPE CULVERT ON CROSS ROAD

PROJECT:-

ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

STANDARD DRAWINGS
TYPICAL - CROSS DRAIN
SINGLE LANE BT ROAD/EARTHEN ROAD

DRG NO.	08R10020001	REV. R1	APPROVED
SH. NO.	21	DATE	21
SCALE	NTS	REV. R1	PREPARED BY: EE/PMU
		REV. R1	CEG. IIA.
			CE, World Bank Projects



Chief Engineer
World Bank Projects, Odisha
EMPLOYER

Chief Engineer
World Bank Project
O/o the E.I.C.(Civil), Odisha
Bhubaneswar

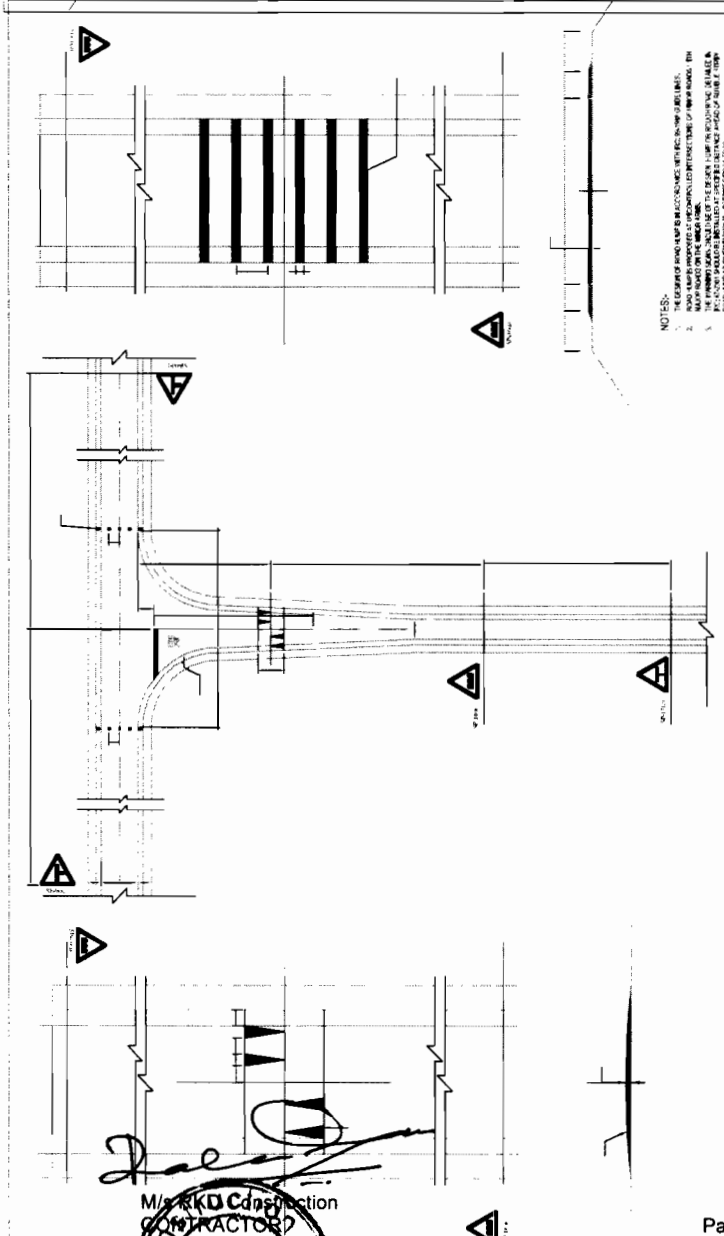
RUMBLE STRIP ON MAIN CARRIAGEWAY

CHAINAGES			
30	4400	5400	6833
10000	18000	19150	23150
24450	24750	32150	33350

SCHEDULE OF RUMBLE STRIP ON SPUR ROAD

T Junction Dwg. Type --A			Y Junction Dwg. Type --A		
Sl. No.	Chainage	LHS/RHS	Sl. No.	Chainage	LHS/RHS
1	18704	RHS	1	3011	LHS
2	23570	LHS	2	10328	LHS
			3	10328	RHS
			4	36381	RHS

T Junction Dwg. Type --B			Y Junction Dwg. Type --B		
Sl. No.	Chainage	LHS/RHS	Sl. No.	Chainage	LHS/RHS
1	1946	LHS	1	5550	LHS
2	2538	RHS	2	8335	RHS
3	7050	RHS	3	15089	RHS
4	7205	LHS	4	15286	LHS
5	11708	LHS	5	16422	LHS
6	11710	RHS	6	16422	RHS
7	12800	LHS	7	20600	RHS
8	12810	RHS	8	21020	LHS
9	15846	RHS	9	22635	LHS
10	17410	RHS	10	37000	RHS
11	28572	LHS	11	37519	LHS
12	29511	RHS			
13	32518	RHS			
14	32802	LHS			



- NOTES:-
1. RUMBLE STRIP SHALL BE 100mm x 100mm x 10mm IN SIZE.
 2. RUMBLE STRIP SHALL BE SPACED AT 100mm ON THE LONGER SIDE.
 3. RUMBLE STRIP SHALL BE SPACED AT 100mm ON THE SHORTER SIDE.
 4. RUMBLE STRIP SHALL BE SPACED AT 100mm ON THE LONGER SIDE & 100mm ON THE SHORTER SIDE.
 5. RUMBLE STRIP SHALL BE SPACED AT 100mm ON THE LONGER SIDE & 100mm ON THE SHORTER SIDE.
 6. RUMBLE STRIP SHALL BE SPACED AT 100mm ON THE LONGER SIDE & 100mm ON THE SHORTER SIDE.
 7. RUMBLE STRIP SHALL BE SPACED AT 100mm ON THE LONGER SIDE & 100mm ON THE SHORTER SIDE.
 8. RUMBLE STRIP SHALL BE SPACED AT 100mm ON THE LONGER SIDE & 100mm ON THE SHORTER SIDE.
 9. RUMBLE STRIP SHALL BE SPACED AT 100mm ON THE LONGER SIDE & 100mm ON THE SHORTER SIDE.
 10. RUMBLE STRIP SHALL BE SPACED AT 100mm ON THE LONGER SIDE & 100mm ON THE SHORTER SIDE.
 11. RUMBLE STRIP SHALL BE SPACED AT 100mm ON THE LONGER SIDE & 100mm ON THE SHORTER SIDE.
 12. RUMBLE STRIP SHALL BE SPACED AT 100mm ON THE LONGER SIDE & 100mm ON THE SHORTER SIDE.
 13. RUMBLE STRIP SHALL BE SPACED AT 100mm ON THE LONGER SIDE & 100mm ON THE SHORTER SIDE.
 14. RUMBLE STRIP SHALL BE SPACED AT 100mm ON THE LONGER SIDE & 100mm ON THE SHORTER SIDE.



SCHEDULE OF ROAD HUMP

SL. NO.	CHAINAGE	TYPE OF JUNCTION
1	1848	T-Junction
2	2475	T-Junction
3	2475	T-Junction
4	2475	T-Junction
5	2475	T-Junction
6	2475	T-Junction
7	2475	T-Junction
8	2475	T-Junction
9	2475	T-Junction
10	2475	T-Junction
11	2475	T-Junction
12	2475	T-Junction
13	2475	T-Junction
14	2475	T-Junction
15	2475	T-Junction
16	2475	T-Junction
17	2475	T-Junction
18	2475	T-Junction
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30	2475	T-Junction
31	2475	T-Junction
32	2475	T-Junction
33	2475	T-Junction
34	2475	T-Junction
35	2475	T-Junction
36	2475	T-Junction
37	2475	T-Junction

World Bank Project
 O/o R.O. & I.A., Odisha
 Bhubaneswar.

PROJECT:-
 ORISSA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE

STANDARD DRAWINGS
DETAILS OF ROAD HUMPS AND RUMBLE STRIPS

DRG NO. : 08PCE/GRH & RS
 SH. NO. : 22
 DATE : 22

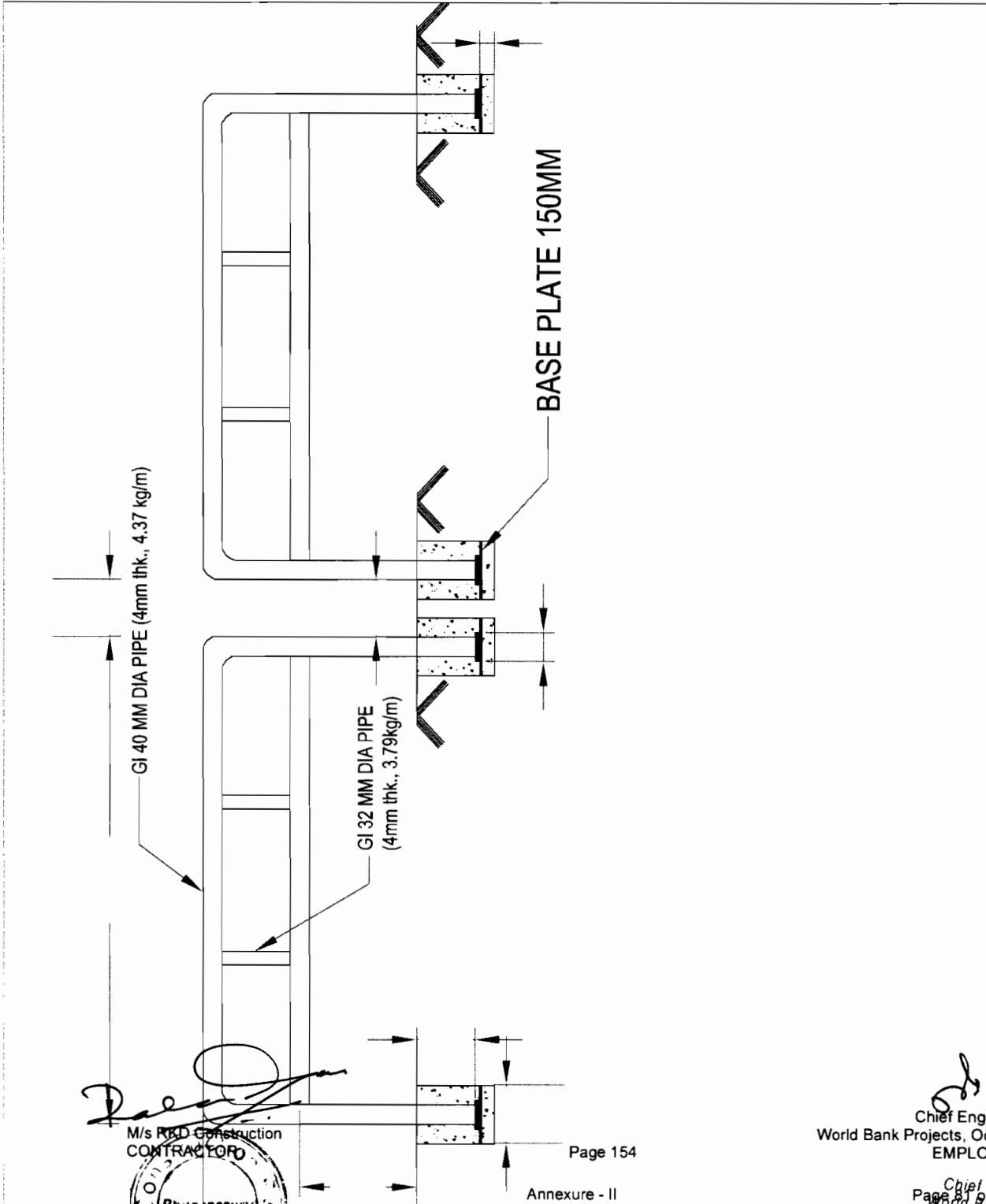
REV. R1 : APPROVED
 REV. R0 : PREPARED BY : EE/PNU
 CEE Ltd.,
 CE, World Bank Projects

SCALE : NTS

SCHEDULE OF FOOT PATH BARRIER

Sl. No.	Challage		LHS/RHS
	Start	End	
1	0.000	820.000	Both Side
2	1600.000	2100.000	Both Side
3	2400.000	2600.000	Both Side
4	3090.000	3480.000	Both Side
5	4410.000	4910.000	Both Side
6	9785.000	10545.000	Both Side
7	7025.000	7270.000	Both Side
8	7745.000	7970.000	Both Side
9	8200.000	8380.000	Both Side
10	9845.000	10600.000	Both Side
11	11665.000	11900.000	Both Side
12	12725.000	13690.000	Both Side
13	15645.000	15880.000	Both Side
14	17200.000	17450.000	Both Side
15	18235.000	19100.000	Both Side
16	20600.000	20920.000	Both Side
17	23200.000	25100.000	Both Side
18	28200.000	28420.000	Both Side
19	31950.000	33330.000	Both Side
20	34100.000	34650.000	Both Side
21	36285.000	37200.000	Both Side

Total Line Drain Length = > 12400 x 2 = 24800



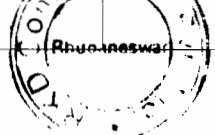
STANDARD DRAWINGS

DETAILS OF FOOTPATH BARRIERS

DRG NO. 08/PP/CE/07B	REV. R0	REV. R1	APPROVED
SH. NO. 23	DATE	PREPARED BY: EE/PNU	CE, World Bank Projects.
SCALE	REV	R1	
			NTS

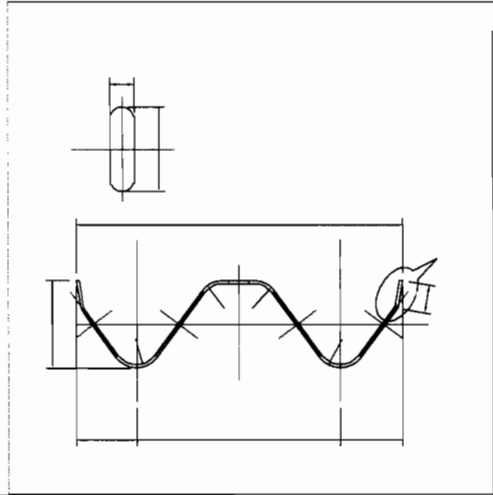
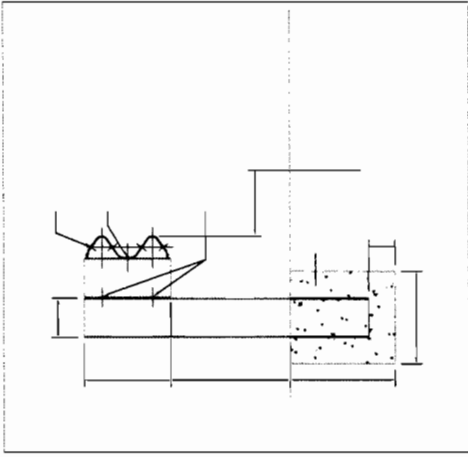
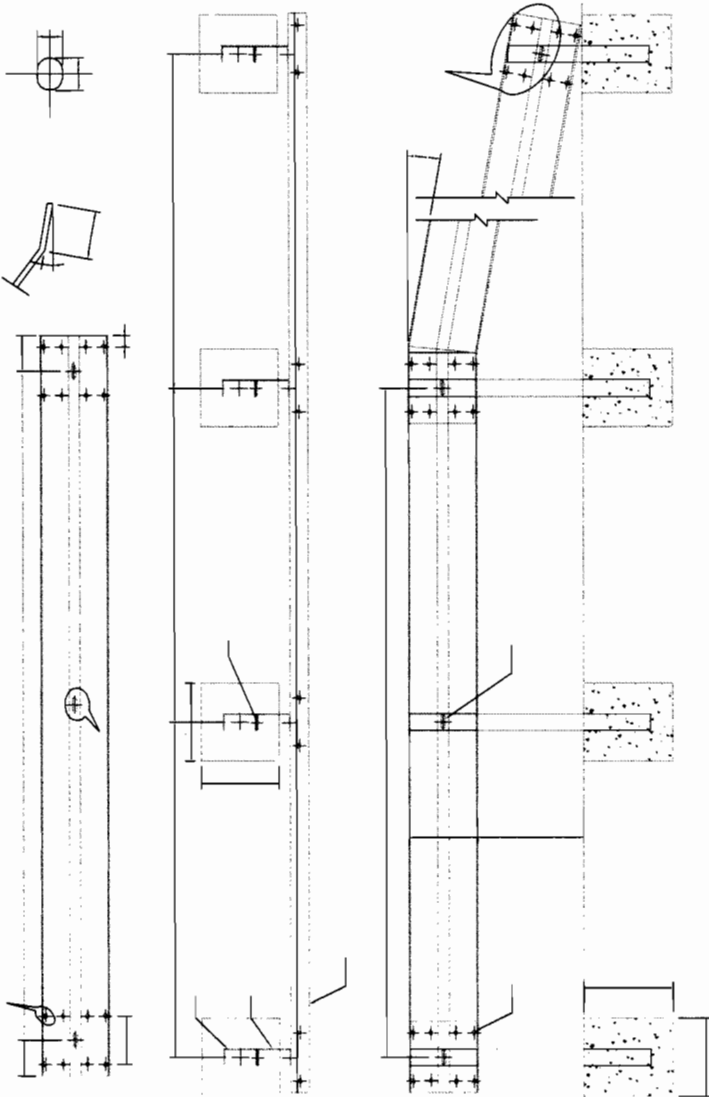
PROJECT:-
 ORISSA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE

M/s RND Construction
 CONTRACTOR



Chief Engineer
 World Bank Projects, Odisha
 EMPLOYER

Chief Engineer
 World Bank Project
 O/o the E.I.C.(Civil), Odisha
 Bhubaneswar.



SCHEDULE OF METAL BEAM CRASH BARRIER			
Start	End	Length	REMARKS
29225	29425	200	BOTH SIDES
29500	29700	200	--do--

PROJECT:-

ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

STANDARD DRAWINGS

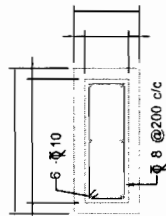
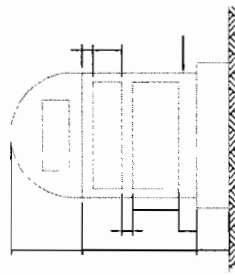
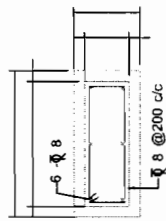
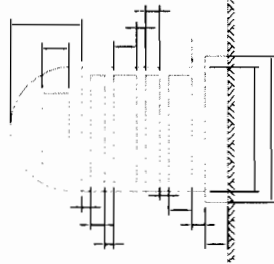
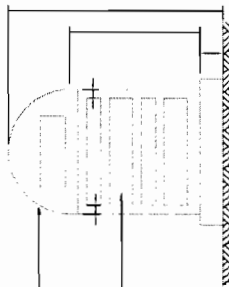
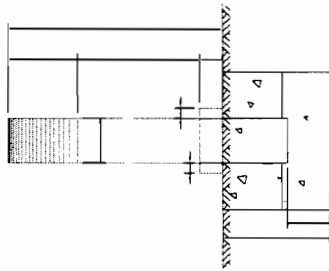
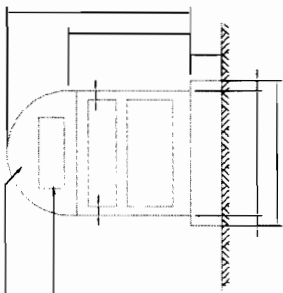
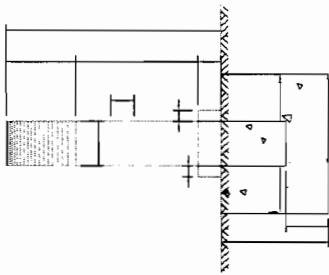
METAL BEAM CRASH BARRIER DETAILS

DRG NO. 088P/CEG/CS	REV. NO. R1	APPROVED
SH. NO. 24	DATE	PREPARED BY : CEG/PAU
SCALE	NTS	CEG, World Bank Projects.

[Signature]
Chief Engineer



World Bank Projects, Odisha
EMPLOYER
Chief Engineer
World Bank Project
O/o the E.P.C.(Civil), Odisha
Bhubaneswar.



TYPICAL DESIGN FOR ORDINARY NILOMOTRE STONE

TYPICAL DESIGN FOR ORDINARY NILOMOTRE STONE

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. REFLECTORISED PAINT SHALL BE IN ACCORDANCE WITH CL.803.5 OF M.O.R.T & H SPEC.
3. FOR TYPE & STYLE SIZE OF LETTERING RELEVANT IRC CODE OF PRACTICE SHALL BE REFERRED.
4. LETTERING IS DONE WITH APPROVED QUALITY BLACK ENAMEL PAINT USING STENCIL

PROJECT:-

ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

STANDARD DRAWINGS
TYPICAL KM STONE & 5TH KM STONE

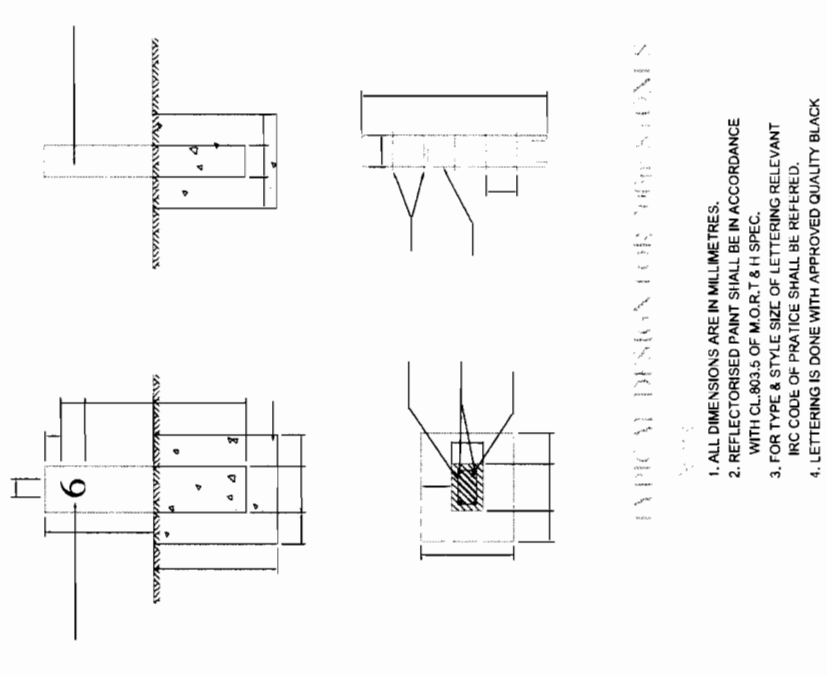
DRG NO.	DATE	REV	REV	REV. R0	APPROVED
SH. NO.	25			PREPARED BY : EE/PMU	CE, World Bank Projects.
SCALE	NTS				

[Signature]
M/s RKD Construction
SUPERVISOR



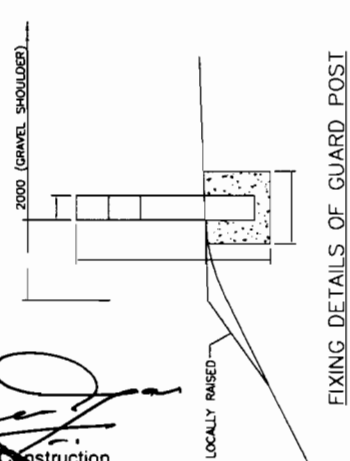
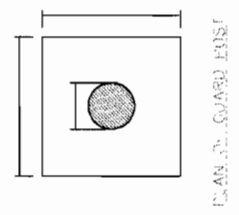
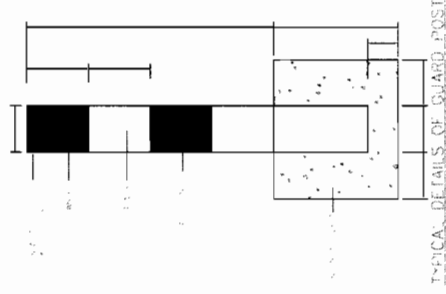
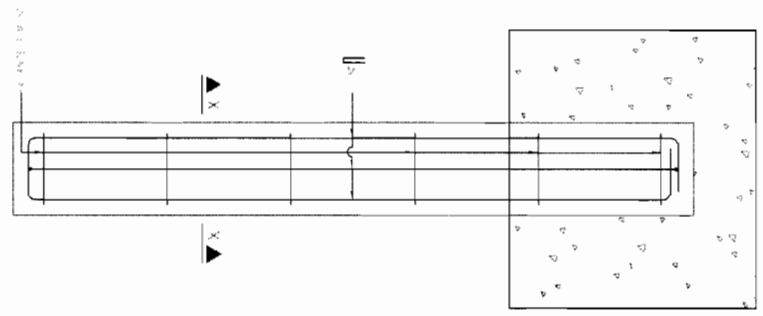
[Signature]
Chief Engineer
World Bank Projects, Odisha
EMPLOYER
Chief Engineer,
World Bank Project
O/o the E.T.C. (Civil), Odisha
Bhubaneswar.

M/s. R&D, Construction
 CONTRACTOR
 Bhubaneswar



TYPICAL DESIGN FOR GUARD POSTS

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. REFLECTORISED PAINT SHALL BE IN ACCORDANCE WITH CL.803.5 OF M.O.R.T & H SPEC.
3. FOR TYPE & STYLE SIZE OF LETTERING RELEVANT IRC CODE OF PRACTICE SHALL BE REFERRED.
4. LETTERING IS DONE WITH APPROVED QUALITY BLACK ENAMEL PAINT USING STENCIL



1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE MENTIONED.
2. R.C.C. GUARD POSTS IS INSTALLED WHERE EMBANKMENT HEIGHT IS GREATER THAN 3 M. AT OTHER HAZARD LOCATIONS.

PROJECT:-

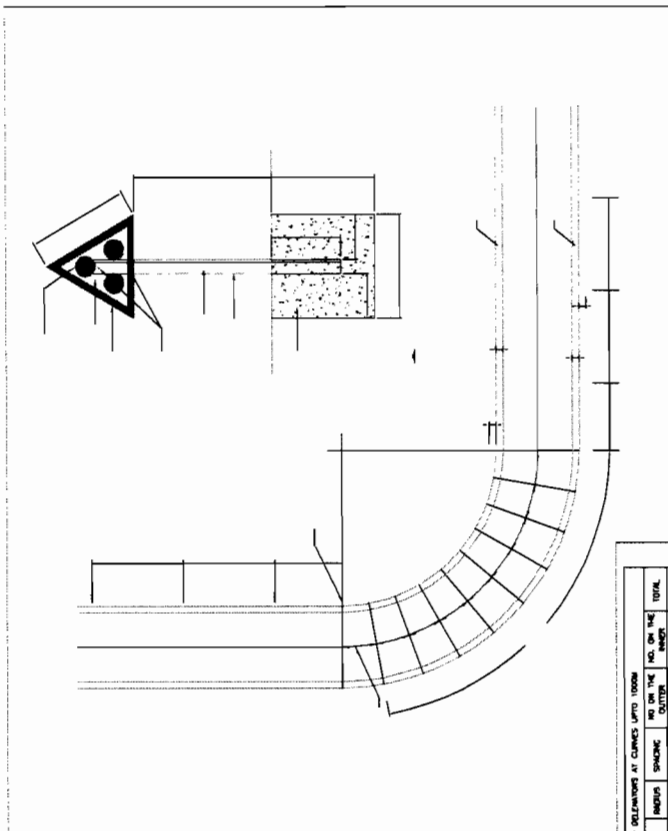
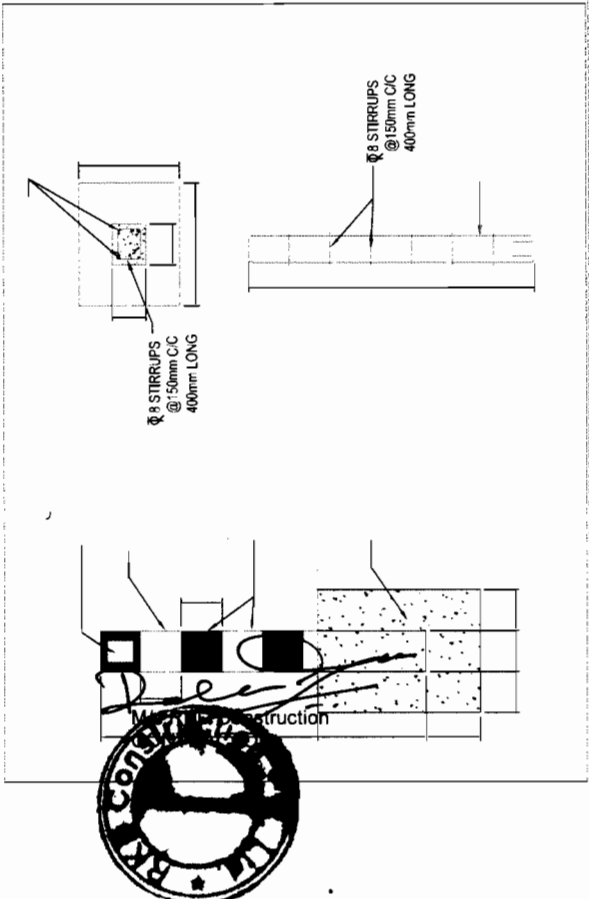
ORISSA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE

STANDARD DRAWINGS
 TYPICAL DETAILS OF 200M STONE & GUARD POST

DRG NO.	OSR/PC/COM/CP	REV. NO	REV. R1	APPROVED
SH. NO.	26	DATE	REV	PREPARED BY :
SCALE			R1	EE/PMU
			NTS	CE, World Bank Projects.

Chief Engineer
 World Bank Projects, Odisha
 EMPLOYER

Chief Engineer
 World Bank Projects
 O/o the E.I.C.(Civil), Odisha
 Bhubaneswar.



NOTES:

- ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED.
- ADJUST DISTANCE 'X' SUITABLY SO THAT THE LAST ROADWAY DELINEATOR IS AT THE END OF THE CURVE.
- INSTALL ALL DELINEATORS AT EDGE AS SHOWN IN THE DRAWING PERPENDICULAR TO THE ONCOMING TRAFFIC. (SEE TABLE FOR VALUE OF 'S' i.e. SPACING OF DELINEATORS ON THE CURVE.
- ON STRAIGHT SECTIONS DELINEATORS SHOULD BE SPACED NORMALLY 50m FROM FACE- OTHER, THE POS IS BEING IN CHAINS, ONE ON EACH SIDE OF THE ROADWAY.
- LOCATIONS OF OBJECT MARKERS
 - TRAFFIC ISLANDS AT APPROACHES TO INTERSECTIONS
 - MEDIAN OPENINGS
 - ON MEDANS & ISLANDS ON FAR SIDE OF THE INTERSECTIONS
 - FACING APPROACHING TRAFFIC AT ISLANDS FORMING LEFT INFILTRATION LANES
- OBJECT MARKERS SHOULD BE SET BACK FROM THE FACE OF THE KERB A DISTANCE OF ATLEAST 500mm
- REQUIREMENT OF REFLECTORS SHALL BE IN ACCORDANCE WITH IRC:79-1981 CODE OF PRACTICE.
- ON EMBANKMENTS WITH HEIGHT MORE THAN 2m CLEAR SPACING OF DELINEATORS SHALL BE 75m.
- DELINEATORS ARE NOT PROVIDED AT LOCATIONS WHERE CHEVRON SIGNBOARDS ARE PROPOSED
- ALL ROAD POSTS ARE PROVIDED ON EMBANKMENTS OF HEIGHT >2m AND <3m AT 10m INTERVAL
- DELINEATORS ARE PROVIDED BEFORE AND AFTER PARAPET WALL ON BOTH SIDES AT ALL BRIDGE LOCATIONS AND ALSO AT CULVERT LOCATIONS WHOSE WIDTH IS LESS THAN 12m AND MORE THAN 10m.
- REFLECTIVE PAINT SHALL BE IN ACCORDANCE WITH CL8045 OF M.O.R.T. & H SPEC.

SCHEDULE OF ROAD DELINEATORS AT CURVES UP TO 1000M

HAZARD OF CURVE	START	END	CURVE RADIUS (METRES)	SPACING (METRES)	NO. ON THE CURVE	NO. ON THE TOTAL
L&L	592.841	1314.678	179.272	1000	42	12
L&L	1068.88	1776.822	700	1000	42	12
L&L	2107.723	2182.188	74.406	1000	30	8
R&L	2429.223	2523.589	697.806	800	45	23
L&L	3318.951	3583.951	396.4	800	45	19
R&L	4442.844	4725.588	115.82	800	45	10
R&L	7186.284	7264.282	26.878	200	30	10
L&L	8246.024	8267.272	117.248	200	30	13
R&L	8914.874	10098.181	181.217	600	38	13
R&L	12068.444	13392.381	342.855	1000	30	17
L&L	12020.278	12611.781	126.118	1000	30	10
L&L	20728.674	20398.04	183.895	800	42	11
R&L	21186.848	21024.618	437.887	1000	30	4
L&L	24278.073	24278.334	134.319	800	45	10
R&L	28117.846	28222.041	50.183	500	36	8
L&L	29426.803	29508.844	71.238	600	30	10
R&L	30980.852	30898.128	62.278	500	30	1
R&L	33332.487	33360	48.313	800	45	8
R&L	34262.818	34471.288	245.137	400	20	10
R&L	36288.188	36828.783	538.800	1000	30	13
L&L	36828.783	37022.853	84.395	600	30	2
R&L	37964.361	37448.485	62.094	500	30	2
L&L	40064.188	40203.288	217.498	1000	45	13
R&L	41320.13	41383.381	64.481	120	12	2
R&L	41782.87	41582.272	18.862	80	8	2
L&L	41778.692	41882.882	113.98	600	30	4
R&L	42187.21	42384.884	197.874	500	30	2
L&L	42487.178	42571.243	26.624	200	20	1

NOTE:
 1. ROAD DELINEATORS SHALL BE PROVIDED AS PER THE GUIDELINES IN IRC:79-1981
 2. FOR THE DETAILS OF ROAD DELINEATORS REFER DWG NO OSRP/CEG/RD

**STANDARD DRAWINGS
DETAILS OF ROAD DELINEATORS**

DRG NO. OSRP/CEG/RD	REV. R1	APPROVED
SH. NO. 77	DATE	PREPARED BY: CE/PMU
SCALE	REV	CEG U.S.
NTS		

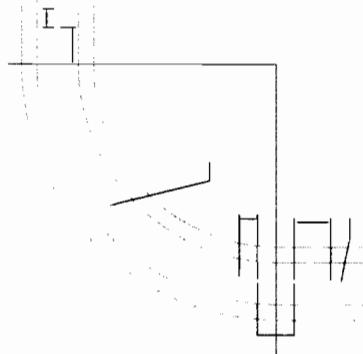
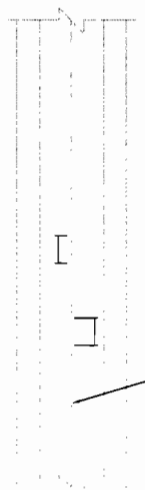
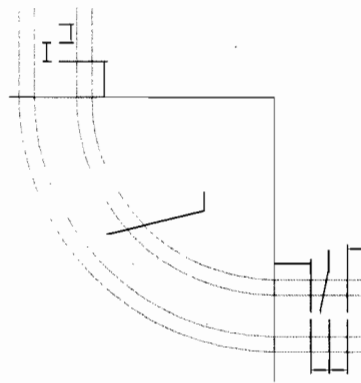
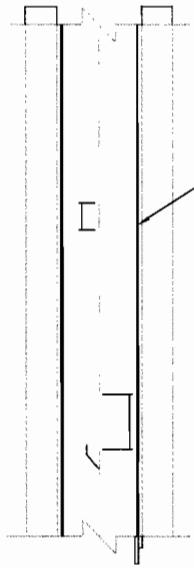
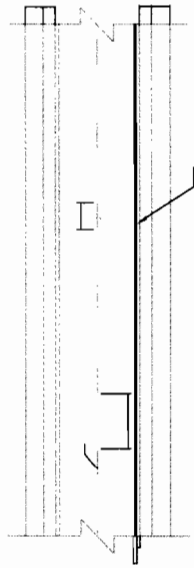
CC. World Bank Projects

**ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE**

PROJECT:-

Chief Engineer,
Projects, Odisha
EMPLOYER

Chief Engineer,
Projects, Odisha
Page 26 of 35
O/o the E.I.C.(Civil), Odisha
Bhubaneswar.



1. EDGE LINE MARKINGS SHOULD NOT BE CARRIED ACROSS THE MOUTHS OF SIDE ROADS
2. CENTRE LINE & EDGE MARK SHALL END AT THE STOP LINE & SHALL NOT BE CONTINUED.
3. STOP MARKING SHOULD BE DONE WITH THERMOPLASTIC PAINT CONFORMING TO CL 802.1
4. DETAILS OF ROAD MARKING ARE AS PER IRC: 35-1987. CODE OF PRACTICE FOR ROAD MARKINGS

STANDARD DRAWINGS
TYPICAL ROAD MARKING DETAILS
(SHEET 1 OF 2)

DRG NO.	USPICE/RMO/	REV. NO	REV. R1	APPROVED
SH. NO.	29	DATE	REV. R1	PREPARED BY :
SCALE				EE/PNU
				CE, World Bank Projects

PROJECT:-
ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

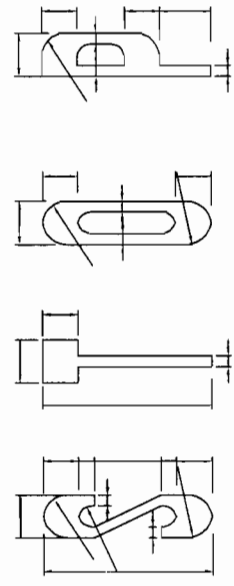
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CONTRACTOR



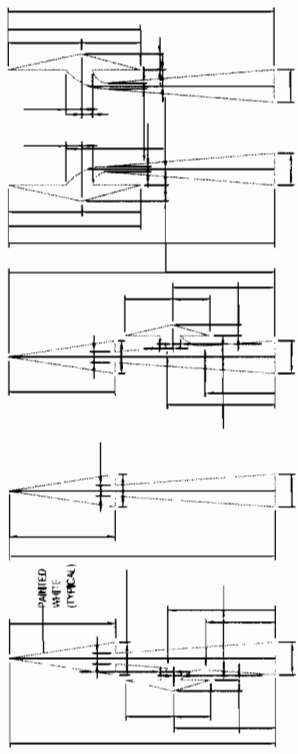
M/s RKD Construction
CONTRACTOR

[Signature]
Chief Engineer
World Bank Projects, Odisha
EMPLOYER

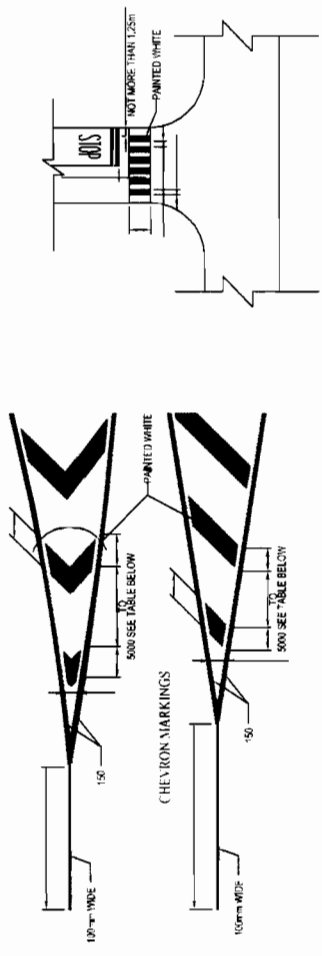
Chief Engineer
World Bank Project
O/o the E.I.C.(Civil), Odisha
Rhubaneswar.



SIZE OF LETTERS

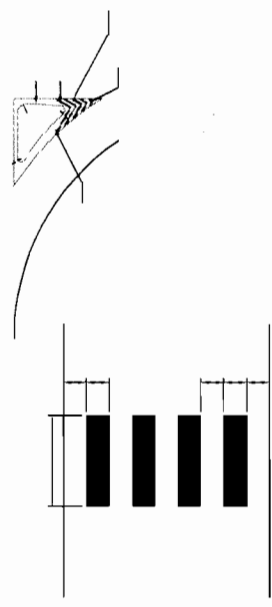


DIRECTIONAL ARROWS



DIAGONAL MARKINGS

CHEVRON MARKINGS



PEDESTRIAN CROSSING

SCHEDULE OF CHEVRON MARKINGS

SL. NO.	LOCATIONS
1	JN AT CH.KM.0/000
2	JN AT CH.KM.24/590
3	AT SPUR ROAD JUNCTIONS (REFER SCHEDULE)

[Signature]
 M/s RKD Construction
 CONTRACTOR
 Bhubaneswar

[Signature]
 Chief Engineer
 World Bank Projects, Odisha
 EMPLOYER
 Chief Engineer
 World Bank Project
 O/o the E.I.C. (Civil), Odisha
 Bhubaneswar.

STANDARD DRAWINGS
 TYPICAL ROAD MARKING DETAILS
 (SHEET 2 OF 2)

ORISSA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE

PROJECT:-

DRG. NO.	DATE	REV	R1	APPROVED
SH. NO.	30			REV. R1
SCALE				PREPARED BY EE/PMU
				CEC Ltd.,
				CE, World Bank Projects.

SP-1 SP-2 SP-2(a) SP-3 SP-4(a) SP-4(b) SP-4(c) SP-4(d) SP-4(e) SP-5(a) SP-5(b) SP-5(c) SP-6 SP-7 SP-8 SP-9(a) SP-9(b) SP-10(a) SP-10(b) SP-10(c) SP-10(d) SP-10(e) SP-10(f) SP-11 SP-12



STOP
COMPULSORY KEEP LEFT
RESTRICTION ENDS
GIVE WAY
SPEED LIMIT 30
SPEED LIMIT 40
SPEED LIMIT 50
SPEED LIMIT 65
SPEED LIMIT 20
OVERTAKING PROHIBITED
ONE WAY
ONE WAY
SCHOOL ZONE
COMPULSORY SOUND HORN
CROSS ROAD
RIGHT SIDE ROAD
LEFT SIDE ROAD
RIGHT HAND CURVE
LEFT HAND CURVE
RIGHT HAIR PIN BEND
LEFT HAIR PIN BEND
RIGHT REVERSE BEND
LEFT REVERSE BEND
T-INTERSECTION
PEDESTRIAN CROSSING

STANDARD DRAWINGS
TYPICAL ROAD SIGNS (SHEET 1 OF 4)

DRG NO.	DATE	REV	RI	REV. NO.	REV. R1	APPROVED
SH. NO.	31			PREPARED BY:	EE/PAA	
SCALE	NTS			CEC. Ld.		CE, World Bank Projects.

PROJECT:-
ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

Chief Engineer
World Bank Projects, Odisha



M/s RKD Construction
CONTRACTOR

Chief Engineer
World Bank Projects, Odisha
EMPLOYER
Chief Engineer
World Bank Project
Page 89 of 151
O/o the E.P.O. (C&A), Odisha
Bhubaneswar.

SP-13(a)		STAGGERED INTERSECTION	SP-13(b)		STAGGERED INTERSECTION	SP-13(c)		MAJOR ROAD AHEAD	SP-13(d)		MAJOR ROAD AHEAD	SP-14(a)		Y-INTERSECTION	SP-14(b)		Y-INTERSECTION												
SP-14(c)		Y-INTERSECTION	SP-14(d)		GAP IN MEDIAN	SP-15(a)		NARROW BRIDGE	SP-15(b)		DUAL C' WAY STARTS	SP-15(c)		DUAL C' WAY ENDS	SP-16(a)		HUMP OR ROUGH ROAD	SP-16(b)		BARRIER AHEAD	SP-17		STATE ROUTE MARKER SIGN	SP-18(a)		GUARDED RAILWAY CROSSING AT 200m	SP-18(b)		GUARDED RAILWAY CROSSING AT 50-100m
SP-15(d)		SERIES OF BLENDS	SP-22		PETROL BUNK	SP-23		HOSPITAL	SP-24		PUBLIC TELEPHONE	SP-25		DISPENSARY	SP-26		EATING PLACE	<p>LEGEND</p> <ul style="list-style-type: none"> WHITE SHEET BLACK SHEET RED SHEET BLUE SHEET 											

NOTE:-

1. DETAILS OF ROAD SIGNS ARE AS PER IRC:SP:30(1).
2. DETAILS OF STATE ROUTE MARKER SIGN AS PER IRC:SP:30(2).
3. ALL MANDATORY AND VOLUNTARY SIGNS SHOULD BE HIGH INTENSITY WHITE ANGLE MIRROR PRISMATIC SHEETING CORRESPONDING TO CLASSIFICATION.
4. ALL INFORMATION SIGNS SHOULD CONFORM TO STANDARDS OF HBS-INTERNATIONAL TYPE RETRO REFLECTIVE SHEETING AS PER CL. 6 OF TECH. SPECIFICATION.

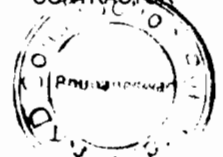
STANDARD DRAWINGS
TYPICAL ROAD SIGNS (SHEET 2 OF 4)

PROJECT:-
ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

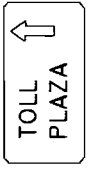
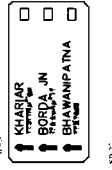
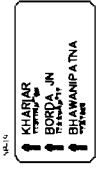
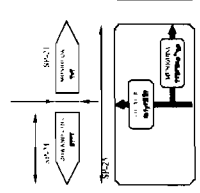
DRG NO.	ORISSA/SP/30/2	REV. NO.		REV. R1	APPROVED
SH. NO.	32	DATE		PREPARED BY:	EE/PMU
SCALE				CEG. LIA.	
				NTS	CC. World Bank Projects

[Signature]

M/s RKD Construction
CONTRACTOR



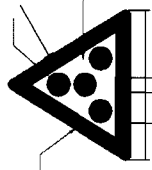
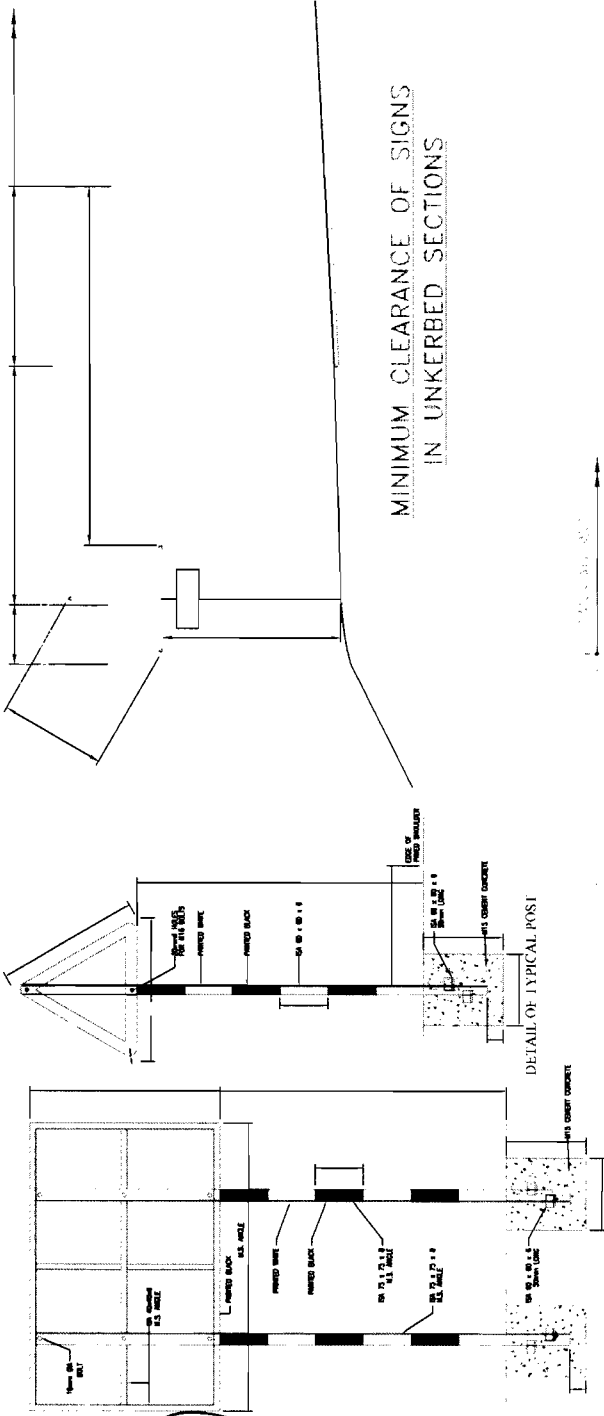
World Bank Projects, Odisha
EMPLOYER
Chief Engineer
Project
O/o the E.I.C.(Civil), Odisha
Bhubaneswar.



MINIMUM CLEARANCE OF SIGNS
IN UNKERBED SECTIONS

NOTES

MINIMUM CLEARANCE OF SIGNS
IN KERBED SECTIONS

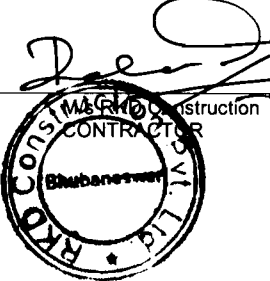


CLUSTER OF
RED REFLECTORS

STANDARD DRAWINGS
TYPICAL ROAD SIGNS (SHEET 3 OF 4)

PROJECT:-
ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

DRG NO. (as per ICRS)	REV. R1	APPROVED
SH. NO. 33	DATE	REV. R0 PREPARED BY: E2/PMU
SCALE	REV. R1	CEC Ltd.
	NTS	CE, World Bank Projects





[Signature]
 M/s RKD Construction
 Bhubaneswar

[Signature]
 Chief Engineer
 World Bank Projects, Odisha
 EMPLOYER
 Chief Engineer,
 World Bank Project
 O/o the E.I.C.(Civil), Odisha
 Bhubaneswar.

SP-29	SP-30	SP-31	SP-32
SP-33	SP-34	SP-35	SP-36
SP-37	SP-38	SP-39	SP-40
SP-41	SP-42	SP-43	SP-44
SP-45	SP-46	SP-47	SP-48
SP-49	SP-50	SP-51	

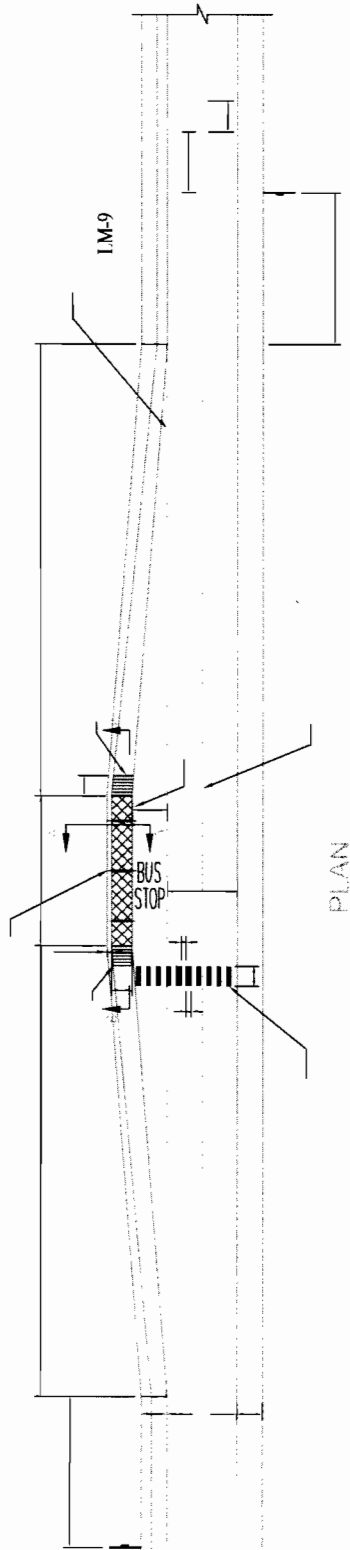
- NOTE
1. DETAILS OF ROAD SIGNS ARE AS PER IRC: 67, 2015 & IRC: 39-1991
 2. DETAILS OF STATE ROUTE MARKER SIGNS AS PER IRC: 3-1990
 3. ALL MANDATORY AND CAUTIONARY SIGNS SHOULD BE HIGH INTENSITY TYPE. ANGLE MORE FRESH WATER SHEETING CONFORMING TO CLARIFICATION OF TECH. SPECIFICATION
 4. ALL INFORMATIONAL SIGNS SHOULD CONFORM TO STANDARDS OF HIGH INTENSITY ENGLISH ILLUMINATED TYPE RATED REFLECTIVE SHEETING AS PER CLARIFICATION OF TECH. SPECIFICATION

STANDARD DRAWINGS
 TYPICAL ROAD SIGNS (SHEET 4 OF 4)

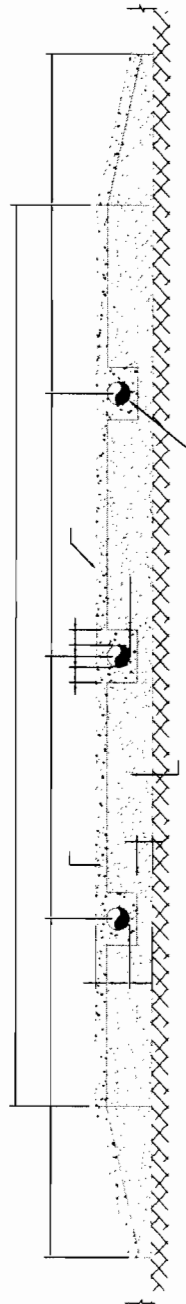
PROJECT:-
 ORISSA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE

DRG NO.	DATE	REV	REV NO	REV BY	APPROVED
34				EE/PMU	
SCALE	NTS		CCG Ltd.		
CC. World Bank Projects					

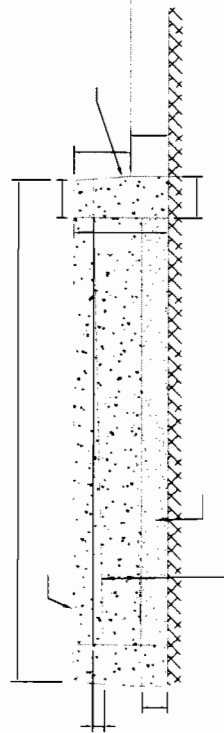
BUS BAY DETAILS



PLAN



SOUTH VIEW



SECTION ON A-A

STANDARD DRAWINGS
TYPICAL BUS BAY TYPE - 1

PROJECT:-
ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

DRG NO.	CORRECTIONS	DATE	REV	REV	REV. R1	APPROVED
SH. NO.	35				PREPARED BY : EE/PMU	CT. World Bank Projects.
SCALE					CEG LIA.	

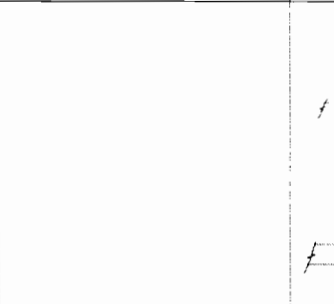
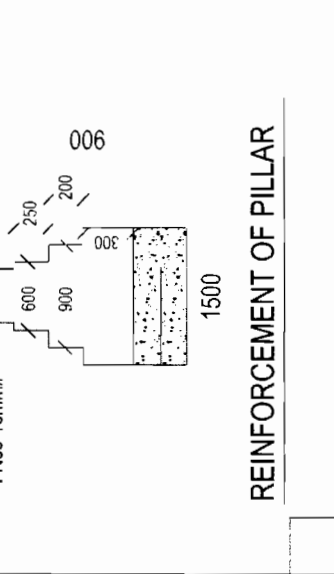
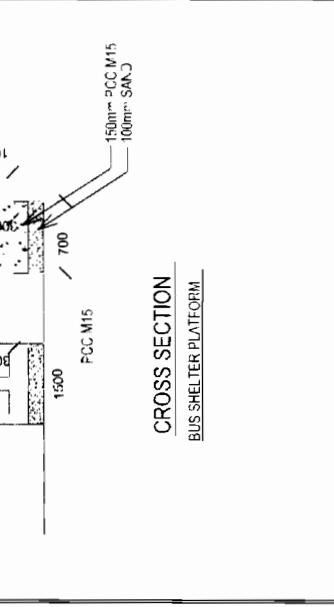
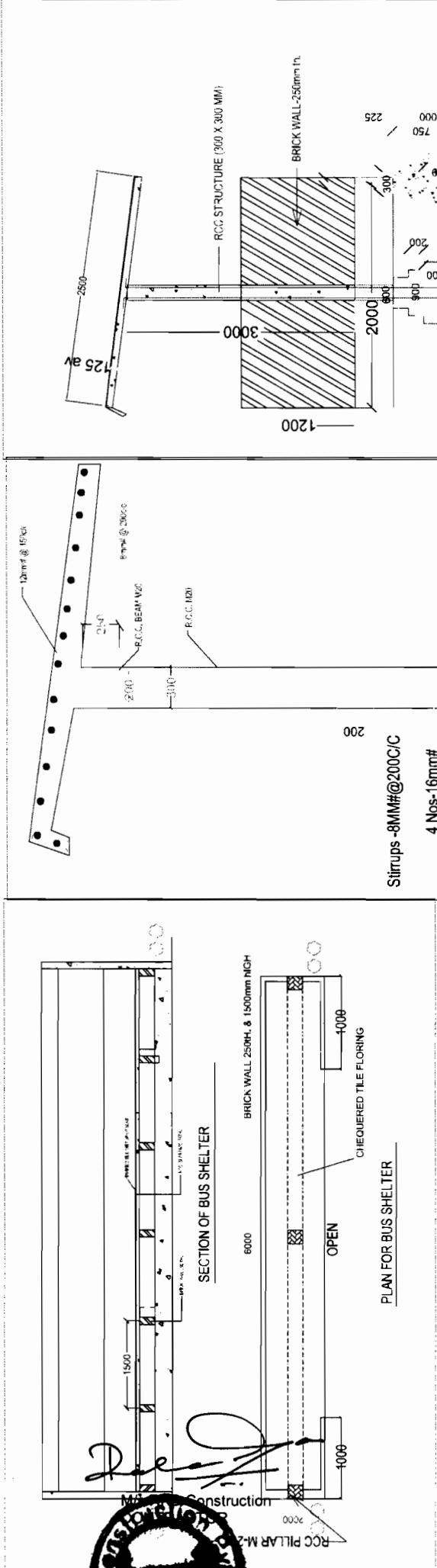
[Signature]

M/s RKD Construction
CONTRACTOR



[Signature]
Chief Engineer
World Bank Projects, Odisha
EMPLOYER

Chief Engineer,
World Bank Project
O/o the E.I.C.(Civil), Odisha
Bhubaneswar.



Schedule of Bus Bay Details

LHS		RHS	
Start	End	Start	End
750	855	245	350
3015	3120	3385	3490
4940	5045	4815	4920
9750	9855	8050	8155
13175	13280	10485	10590
18590	18695	13050	13155
20440	20545	18680	18785
23950	24055	20955	21060
28110	28215	24370	24475
32280	32385	28440	28545
34615	34720	33065	33170
		34225	34330
		37100	37205

Schedule of Bus Bay Details

LHS		RHS	
Start	End	Start	End
750	855	245	350
3015	3120	3385	3490
4940	5045	4815	4920
9750	9855	8050	8155
13175	13280	10485	10590
18590	18695	13050	13155
20440	20545	18680	18785
23950	24055	20955	21060
28110	28215	24370	24475
32280	32385	28440	28545
34615	34720	33065	33170
		34225	34330
		37100	37205

Schedule of Bus Bay Details

Start	End	Type	Ref. Drawings
750	855	1	ORSP/CEG/BB/01
3015	3120	1	-0-
4940	5045	1	-0-
9750	9855	1	-0-
13175	13280	1	-0-
18590	18695	1	-0-
20440	20545	1	-0-
23950	24055	1	ORSP/CEG/RR/02
28110	28215	1	ORSP/CEG/BB/01
32280	32385	1	-0-
34615	34720	1	-0-
		1	-0-



Annexure - I
Page 26 of 35

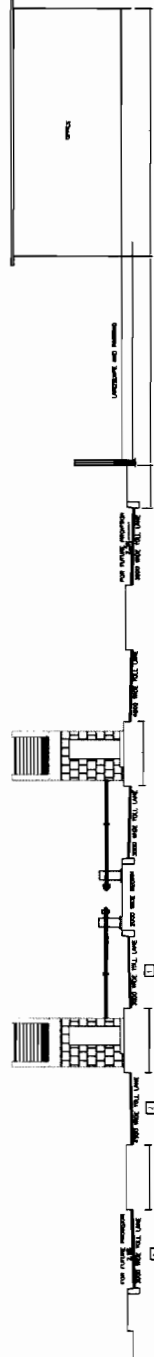
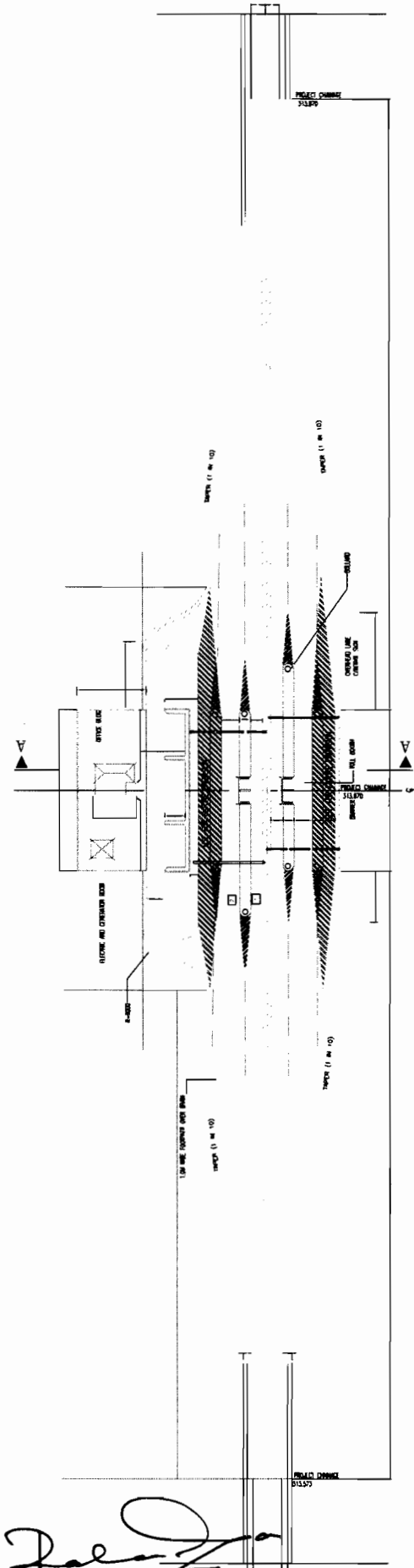
Chief Engineer
Projects, Odisha
EMPLOYER
Bhubaneswar
Bhubaneswar.

PROJECT:-

ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

STANDARD DRAWINGS
TYPICAL BUS BAY SECTION DRAWING

DRG NO.	ORSP/CEG/BB/01	REV. NO.	01	APPROVED
SH. NO.	17	PREPARED BY	EE/PMU	CE, World Bank Projects.
SCALE			NIS	



RESERVED LANE FOR THROUGH TRAFFIC (VEHICLES WHO HAVE PAID TOLL AT PREVIOUS TOLL PLAZA)

GENERAL LANE

RESERVED LANE FOR MULTIAXLE VEHICLES

NOTES:-

- BITUMINOUS PAVEMENT SHOULD BE PROVIDED IN TOLL-LANES
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE NOT TO BE SCALED AND ONLY WRITTEN DIMENSIONS TO BE FOLLOWED

LOCATION: KM.21+800 TO KM.22+140

[Signature]
M/s RKD Construction



[Signature]
Chief Engineer
World Bank Projects, Odisha
EMPLOYER

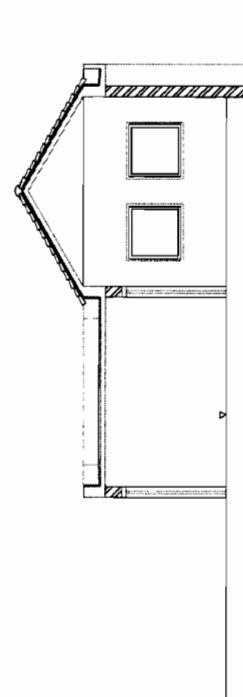
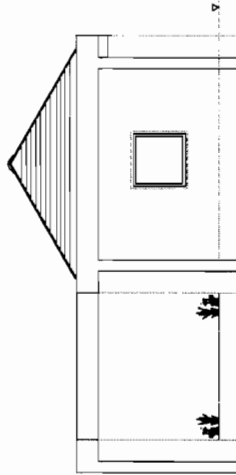
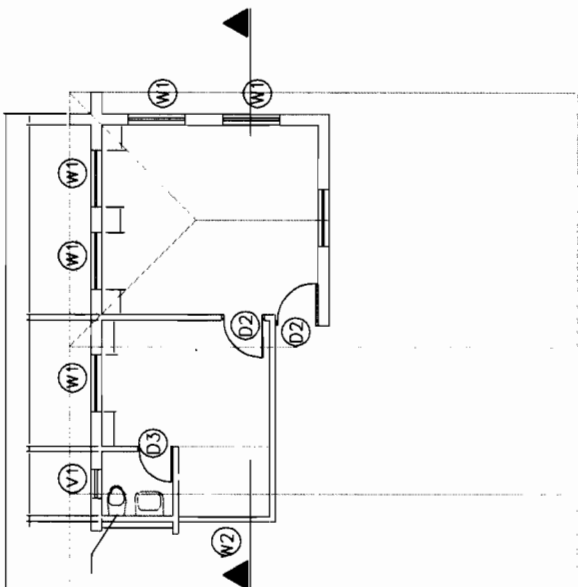
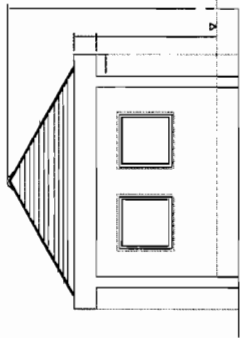
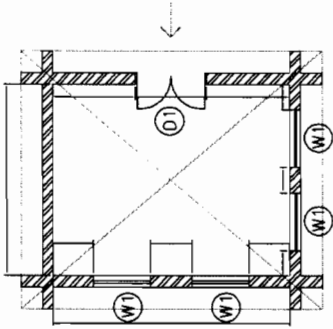
Chief Engineer,
World Bank Project
O/o the E.I.C.(Civil), Odisha
Bhubaneswar.

PROJECT:-

ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE.

STANDARD DRAWINGS
TOLL PLAZA LAYOUT (KM21+800 TO KM.22+140)

DRG NO.	DATE	REV	R1	REV NO	PREPARED BY :	REV NO	PREPARED BY :	APPROVED
SH. NO.	45			45	EE/PMU		EE/PMU	CE, World Bank Projects
SCALE	N1S			CEG LM.				



SCHEDULE OF DOORS & WINDOWS

S. NO.	TYPE	MASONRY OPENING		CILL LEV	LINTEL LEV
		WIDTH	HEIGHT		
1.	D1	1500	2100	0.0	2100
2.	D2	900	2100	0.0	2100
3.	D3	750	2100	0.0	2100
4.	W1	1200	1200	+900	2100
5.	W2	900	1200	+900	2100
6.	V1	600	600	+1500	2100

PROJECT:-

ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE.

STANDARD DRAWINGS

TOLL PLAZA MAIN OFFICE
TOLL PLAZA LOCATION :-KM.28+800 TO KM.22+140

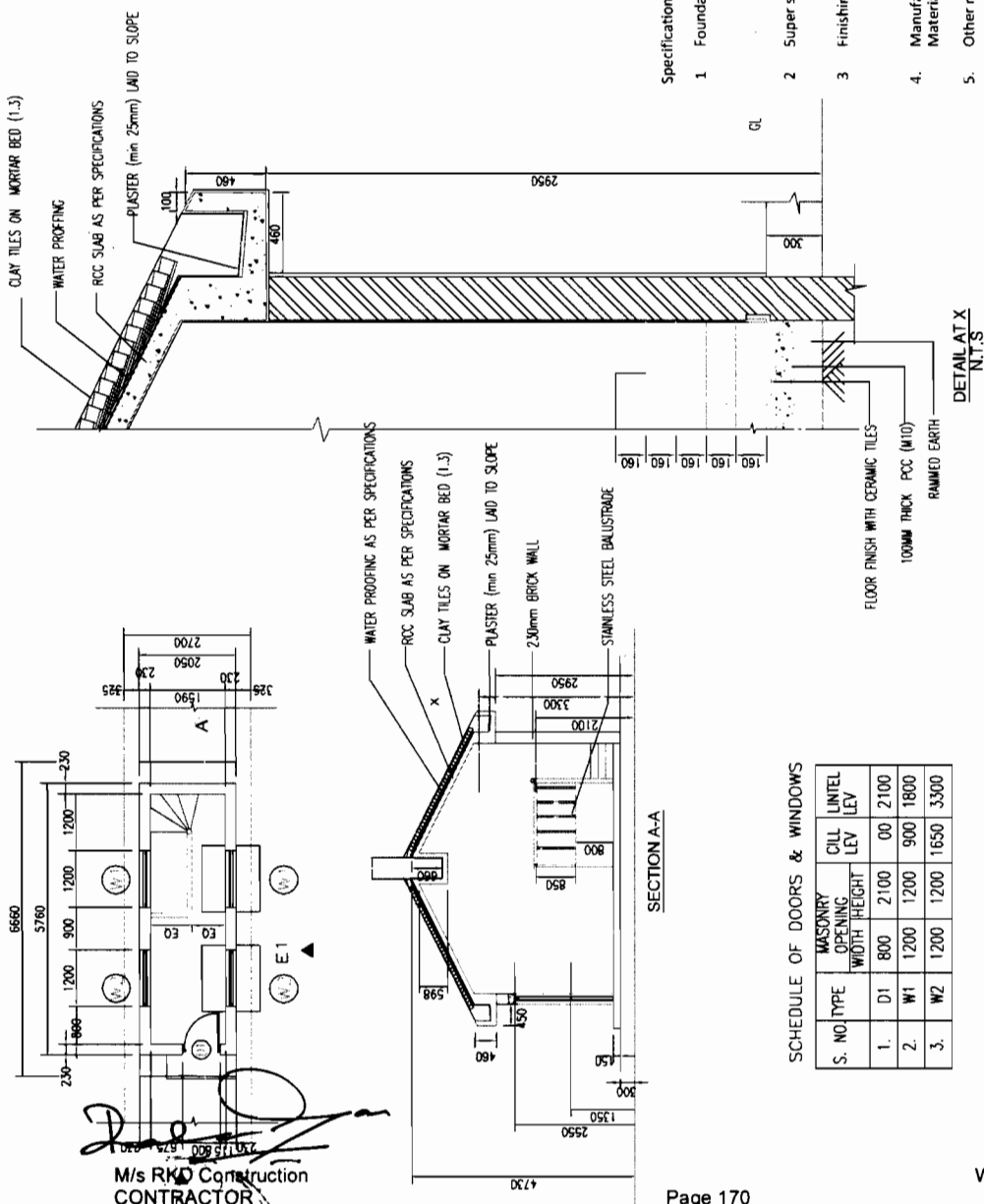
DRG NO.	DATE	REV	R1	REV NO	REV R1	APPROVED
SH. NO.	46			PREPARED BY	EG/PAU	CE, World Bank Projects
SCALE	NTS			GEC I.M.		

[Signature]

M/s RKB Construction
CONTRACTOR



[Signature]
Chief Engineer
World Bank Projects, Odisha
EMPLOYER



[Signature]
 M/s RKD Construction
 CONTRACTOR

Specifications for Toll Plaza

1. Foundation
 - RCC of M20 grade for Raft/ Pedestal, columns and plinth band
 - Filling with sand
 - Antitermite treatment
 - Damp Proof Course
2. Super structure
 - Walls with Brick work in cement mortar 1:6
 - RCC continuous lintels in M20
 - Slab and Beams in RCC of M20 grade
 - External plaster 5mm thick in C.M. 1:6
 - Exterior Acrylamulsion painting
 - Interior Acrylamulsion painting
3. Finishing
 - Vitrified floor tiles of size 605mm x 605mm (double charged)
4. Manufacturer's Materials
 - Reinforcing steel, structural steel, cement, paints to be approved by Engineer before in the works a Manufacturer's Test Certificate to be produced for each batch of supply
5. Other materials
 - Materials such as sand, stone aggregate, earth to pass the acceptance criteria
6. Fabricated Materials
 - Materials for shutters, grills and similar items will be as per technical specifications
7. Fittings and Fixtures
 - Sanitary fittings, electrical fittings, hardware fittings and all such materials have to be approved by the Engineer
8. Doors:
 - One side Teak veneer Flush Doors of thickness 35mm conforming to IS 2202(Part-1), 1999
9. Windows:
 - Anodised Aluminium Window frames and shutters conforming to IS-1081, with 5mm thick glazing and MS grills in the masonry opening.

SCHEDULE OF DOORS & WINDOWS

S. NO.	TYPE	MASONRY WIDTH	OPENING WIDTH	HEIGHT	CILL LEV	LINTEL LEV
1.	D1	800	2100	00	2100	2100
2.	W1	1200	1200	900	1800	1800
3.	W2	1200	1200	1650	3300	3300

[Signature]
 Chief Engineer
 World Bank Projects, Odisha
 EMPLOYER

[Signature]
 Chief Engineer
 World Bank Project
 O/o the E.I.C.(Civil), Odisha
 Bhubaneswar.

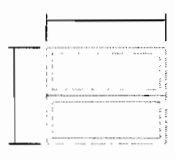
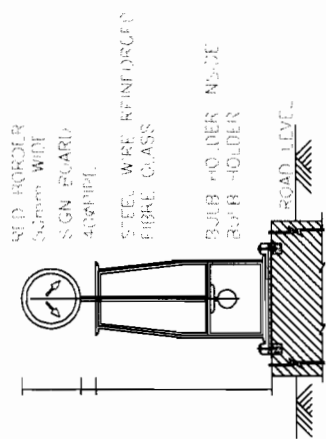
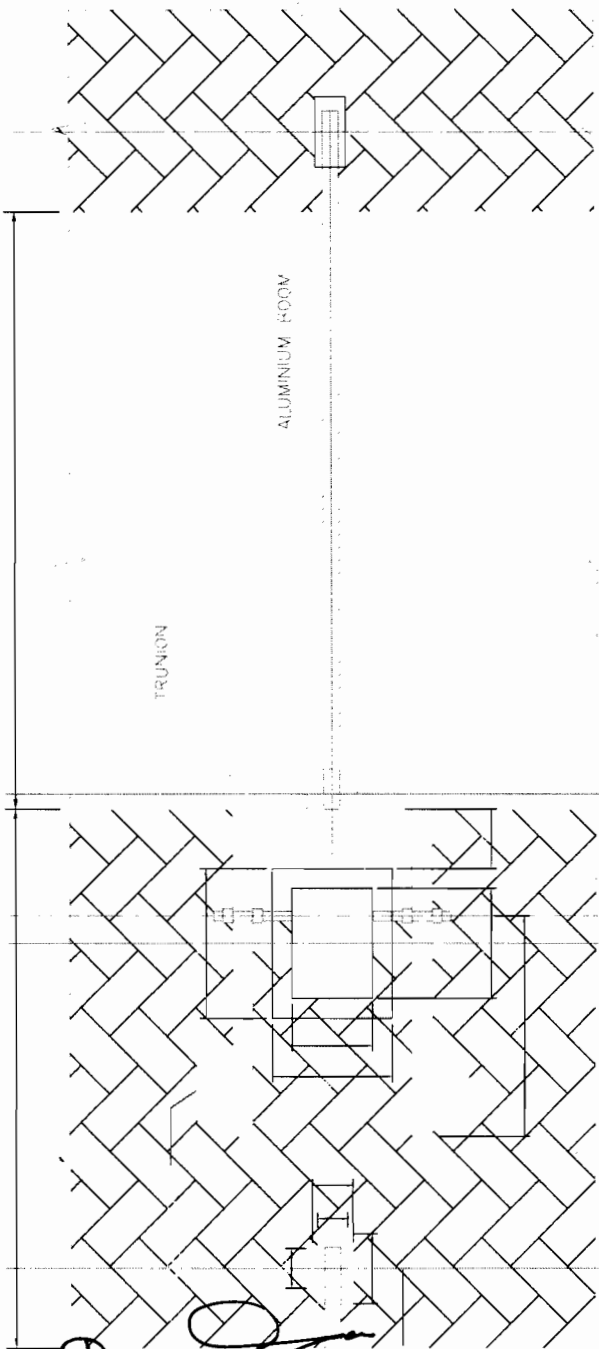
PROJECT:-

ORISSA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE.

STANDARD DRAWINGS
 TOLL BOOTH

TOLL PLAZA LOCATION :- KM.28+800 TO KM.22+140

DRG NO. 08BHC02/03/02	REV. NO. 47	DATE	REV	R1	APPROVED
SH. NO.	47	DATE	REV	R1	PREPARED BY: EE/MHU
SCALE	NTS				CEC LIA.
CL. Road Bank Project.					



REFLECTION TAPE AS PER SPECIFICATIONS
REFLECTING FLAG SIGN
ALUMINIUM BOOM

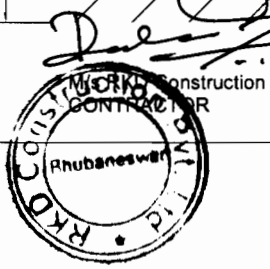
As per all dimensions in millimeter, unless specified

**STANDARD DRAWINGS
BARRIER GATE FOR TOLL PLAZA
TOLL PLAZA LOCATION: KM.21+800 TO KM.22+140**

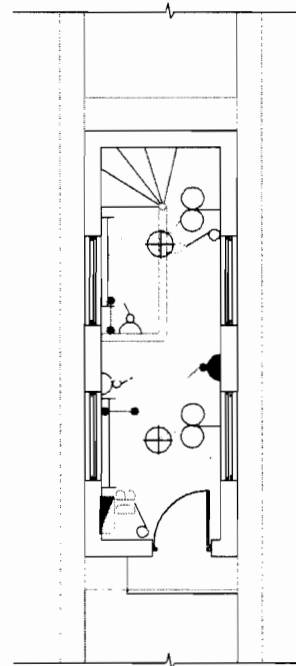
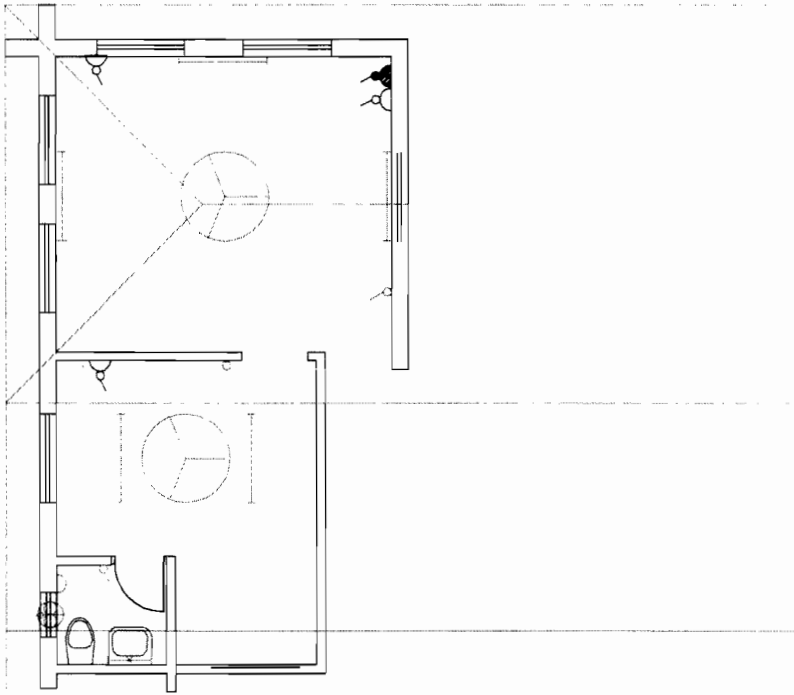
ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE.

PROJECT:-

DRG NO.	DESCRIPTION	REV. NO.	DATE	REV	DATE	REV. NO.	DATE	REV. NO.	DATE
SH. NO.	48	R1				EE/PAU		APPROVED	
SCALE									CE, World Bank Projects



Chief Engineer
World Bank Projects, Odisha
EMPLOYER
Chief Engineer
World Bank Project
O/o the E.T.C.(Civil), Odisha
Bhubaneswar.



- 5 A ONE WAY SWITCH/SWITCH BOARD (1000 MM FROM FFL)
- 5 A TWO WAY SWITCH/SWITCH BOARD (1000 MM FROM FFL)
- 5 A SOCKET WITH SWITCH (150 MM FROM FFL)
- 15 A POWER SOCKET WITH SWITCH (150 MM FROM FFL)
- GEYSER 15 A SOCKET
- 15 A SWITCH FOR GEYSER
- 25 A A/C-OUTLET (150 MM FROM FFL)
- 5 A LIGHT-PLUG WITHOUT SWITCH FOR EXHAUST FAN (1800 MM FROM FFL)
- TELEPHONE OUTLET (150 MM FROM FFL)
- TV OUTLET (150 MM FROM FFL)
- CALL BELL SWITCH (1000 MM FROM FFL)
- BELL BUZZER (2100 MM FROM FFL)
- CEILING LIGHT
- BRACKET LIGHT (2100 MM FROM FFL)
- MIRROR LIGHT
- 1 x 36 W SINGLE TUBE LIGHT
- EXHAUST FAN
- DISTRIBUTION BOARD
- CEILING FAN

STANDARD DRAWINGS
ELECTRICAL LAYOUT
TOLL PLAZA AND MAIN OFFICE

DRG NO.	ORISSA/CE/PROJ	REV. NO.	REV. BY	APPROVED
SH. NO.	49	DATE	PREPARED BY :	CE, World Bank Projects.
SCALE			CEC. Ltr.,	
			EE/PMU	

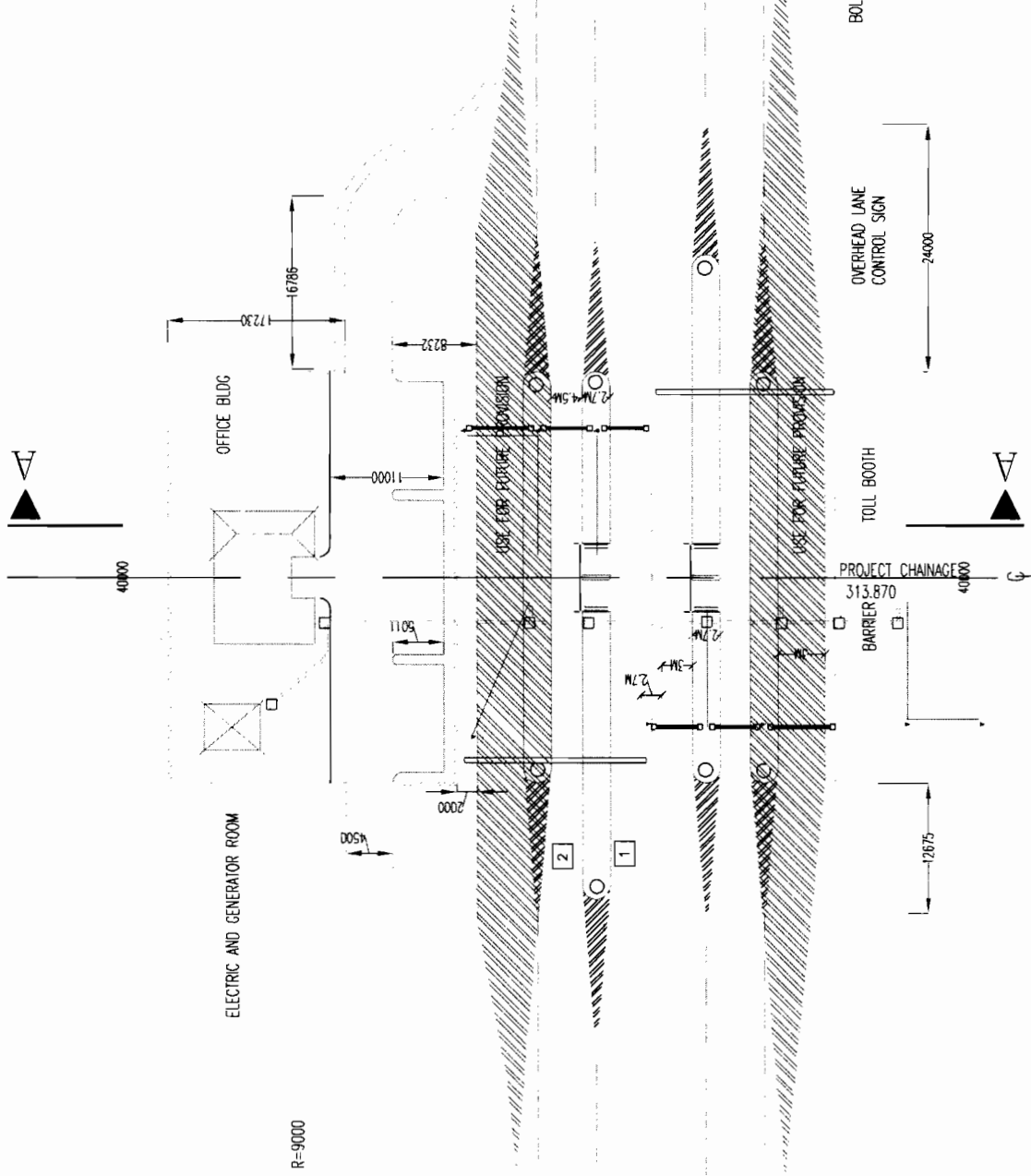
PROJECT:-

ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE.

Dale
M/s RKD Construction
CONTRACTOR
Rhubaneswar

Chief Engineer
World Bank Projects, Odisha
EMPLOYER

Chief Engineer
World Bank Projects
O/o the E.I.C. (Civil), Odisha
Bhubaneswar.



STANDARD DRAWINGS
ELECTRICAL LAYOUT - TOLL PLAZA(KM.21+800 TO KM.22+140)

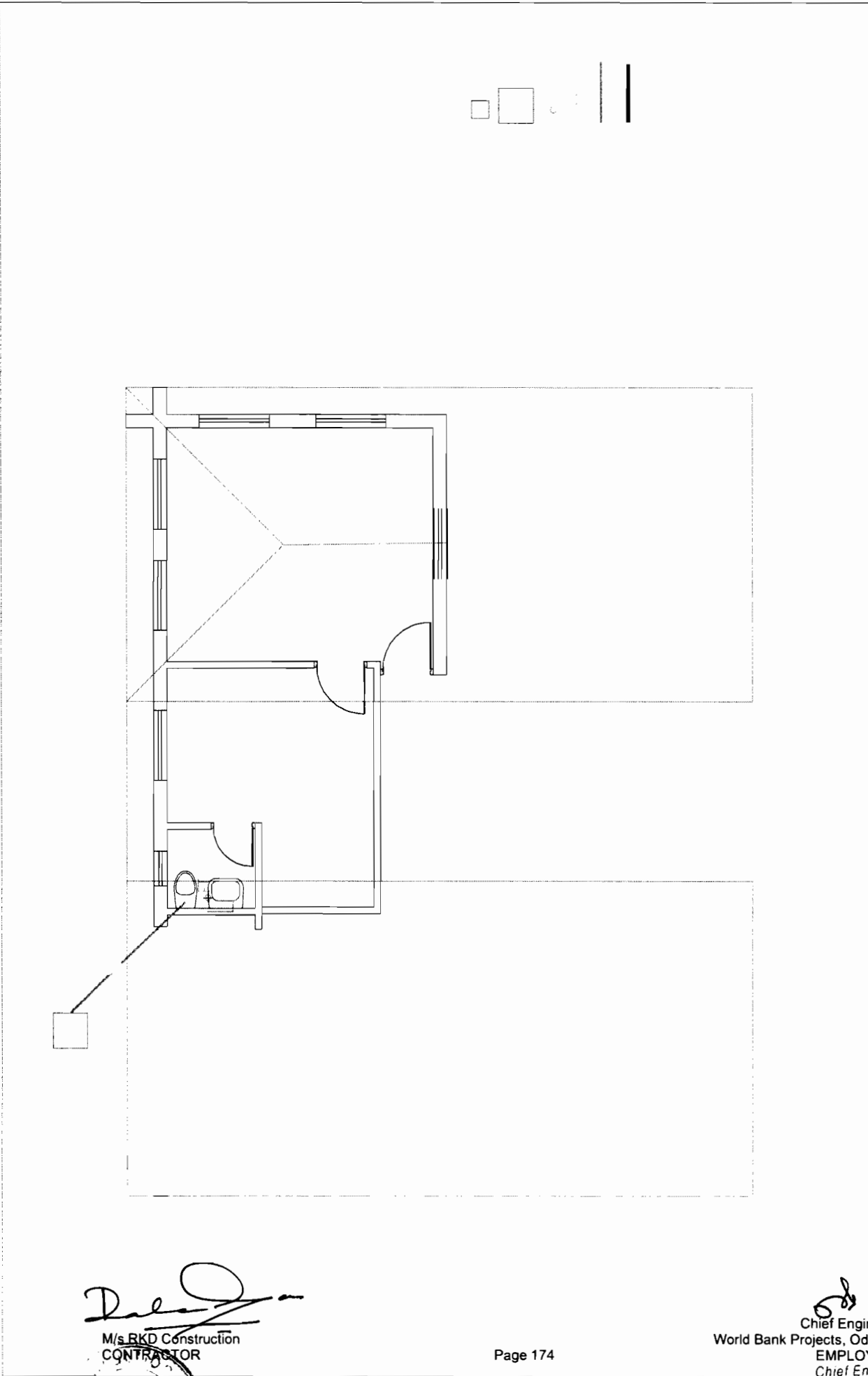
DRG NO. 058P/EC/01/06	REV. NO. PREPARED BY :	REV. R1	APPROVED
SH. NO. 50	DATE	REV	CE/PAU
SCALE	NTS		CE, World Bank Projects

PROJECT:-
ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE.

[Signature]
M/s RKD Construction
CONTRACTOR

[Signature]
Chief Engineer
World Bank Projects, Odisha
EMPLOYER





STANDARD DRAWINGS
PLUMBING LAYOUT - TOLL PLAZA(KM.21+800 TO KM.22+140)

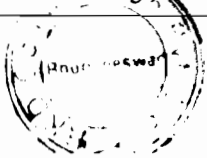
DRG NO.	OSHPKSGTUP	REV NO	REV R1	APPROVED
SH. NO.	51	DATE	REV R1	REV R1 PREPARED BY :
SCALE			NTS	EE/PAU

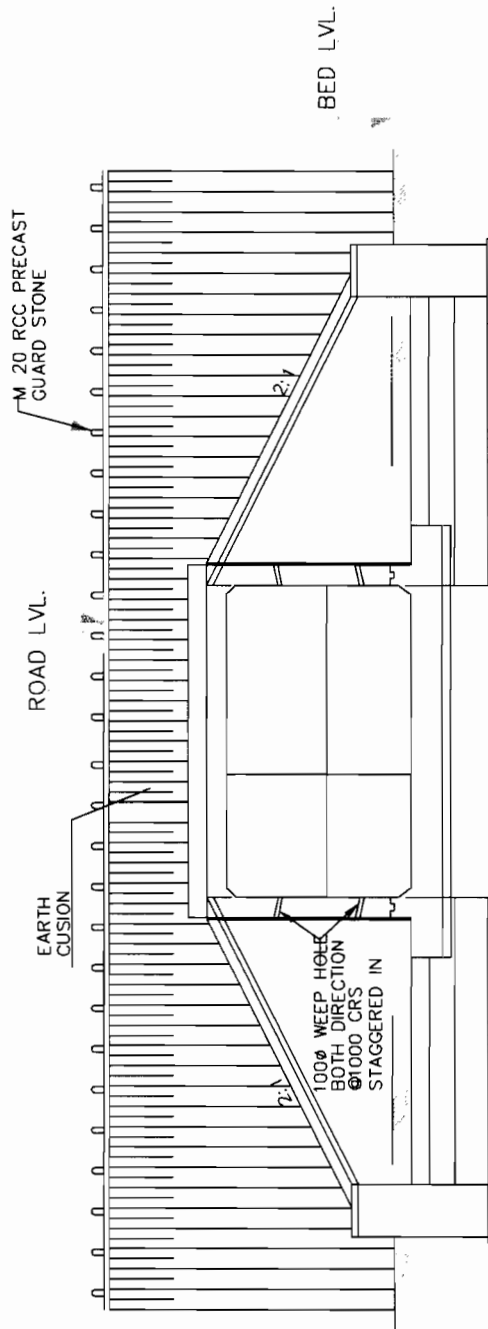
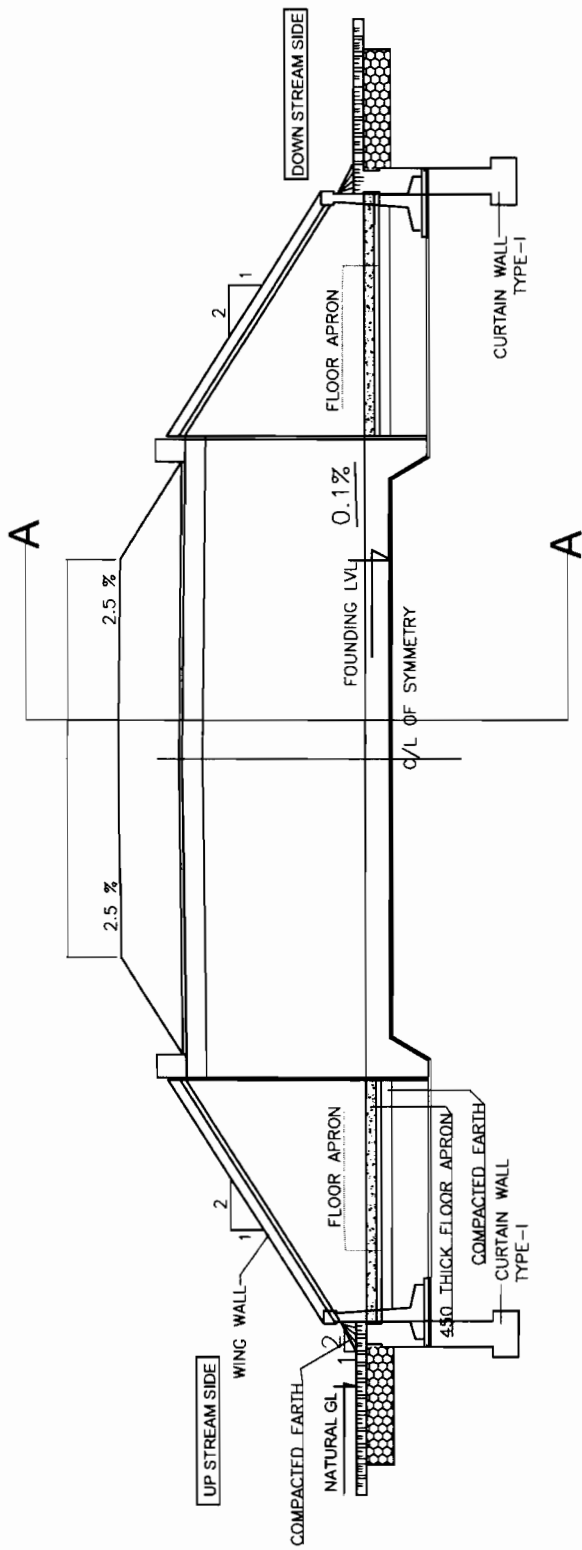
CE, World Bank Projects.

PROJECT:-
 ORISSA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE.

[Signature]
 M/s RKD Construction
 CONTRACTOR

[Signature]
 Chief Engineer
 World Bank Projects, Odisha
 EMPLOYER
 Chief Engineer
 World Bank Project
 O/o the E.I.C.(Civil), Odisha
 Bhubaneswar.





SECTION A-A

PROJECT:-

ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE.

STANDARD DRAWINGS

ANIMAL UNDER PASS (EARTH CUSHION)-KM.27+026

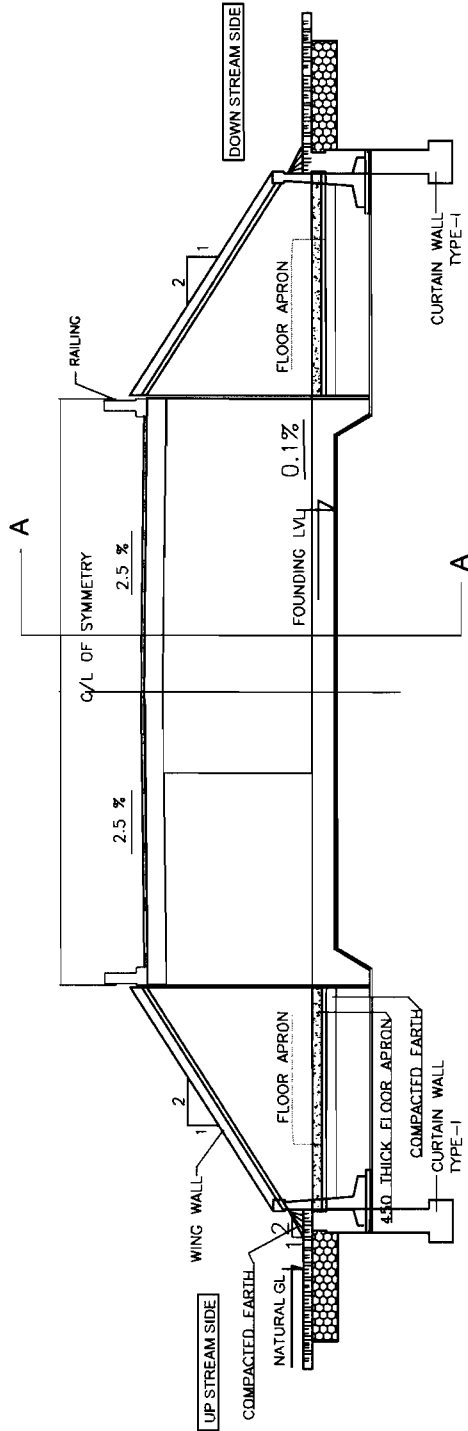
DRG NO. (CONTINUED FROM)	REV. NO.	DATE	REV	R1	APPROVED
SH. NO.	51				PREPARED BY:
SCALE	NTS				CEZ/PMU
					CE, World Bank Projects

[Signature]
M/s RKD Construction

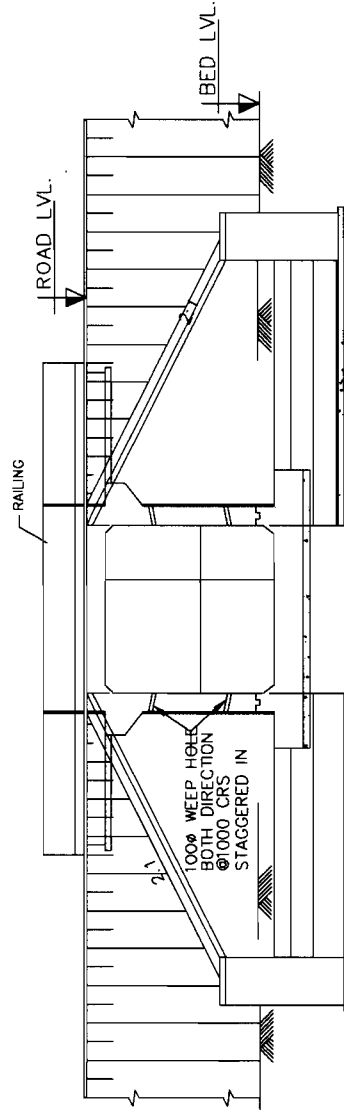


[Signature]
Chief Engineer
World Bank Projects, Odisha
EMPLOYER

Chief Engineer
World Bank Projects
O/o the E.I.C. (Civil), Odisha
Bhubaneswar.

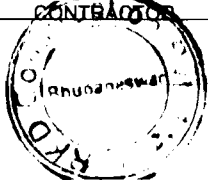


LONGITUDINAL SECTION



SECTION A-A

[Signature]
 M/s. RKB Construction
 CONTRACTOR



[Signature]
 Chief Engineer
 World Bank Projects, Odisha
 EMPLOYER

Chief Engineer,
 World Bank Project
 O/o the E.I.C. (Civil), Odisha,
 Bhubaneswar.

PROJECT:-

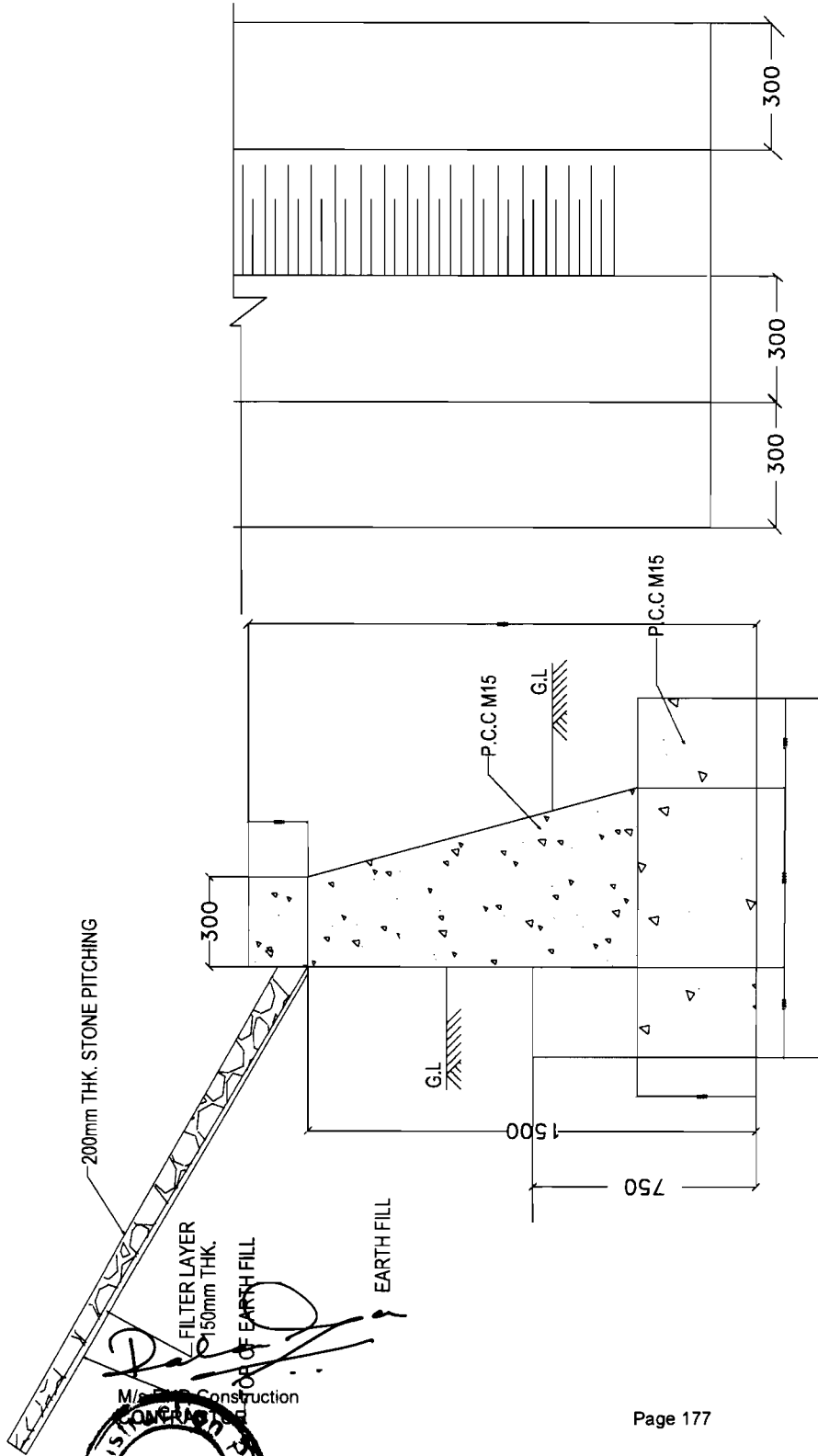
ORISSA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE

TYPICAL ANIMAL PASS - SINGLE BOX CULVERT (1/22/0)
 (WITHOUT EARTH CUSHION)
 AT CHAINAGE KM.2+137 & KM.9+786

DRG NO.	ER/B/C/S/B/E/C/XXVI - B1	REV. NO.		APPROVED
SH. NO.	17	DATE		PREPARED BY : EG/PMU
SCALE				CE, World Bank Projects
			NTS	

SCHEDULE FOR TOE WALLS

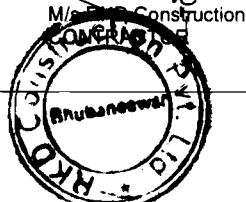
Sl No.	Chaining at km	Location left/right	Length of toe wall in Mtrs.
1	1.97	L	110
2	3.65	L	17
3	5.00	R	30
4	5.17	L	20
5	5.55	L	55
6	6.07	L	60
7	7.22	L	50
8	7.38	R	40
9	10.88	L	65
10	11.90	L	40
11	17.12	L	55
12	18.63	L	30
13	19.29	L	250
14	19.74	L	40
15	20.86	L	95
16	22.56	L	40
17	23.28	R	25
18	24.39	L	15
19	25.12	L	75
20	25.23	R	30
21	30.68	R	220
22	30.85	L	51
23	32.13	R	94
24	34.02	L	56
25	34.66	L	76
26	34.75	L	65
27	36.20	L	76
28	36.23	R	46
29	38.85	R	15
30	39.32	R	70
31	40.20	R	90
Total	2001		



PLAN OF TOE WALL FOR WATER BODY

TOE WALL FOR POND
(CROSS SECTION)

TO MINIMISE IMPACT ON STORAGE CAPACITY & WATER SPREAD OF PONDS, WATER BODY, NALA BED RETAINING WALLS TO BE ERRECTED SUCH THAT IT PREVENTS ACCIDENTAL FALL INTO THE DEPRESSION AND WASHING OF VEHICLES/BATHING/ WASHING GHAT ON THE ROAD SIDE



Chief Engineer
World Bank Projects, Odisha
Bhubaneswar.
EMPLOYER
World Bank Project
Page 89 of 100
Bhubaneswar.

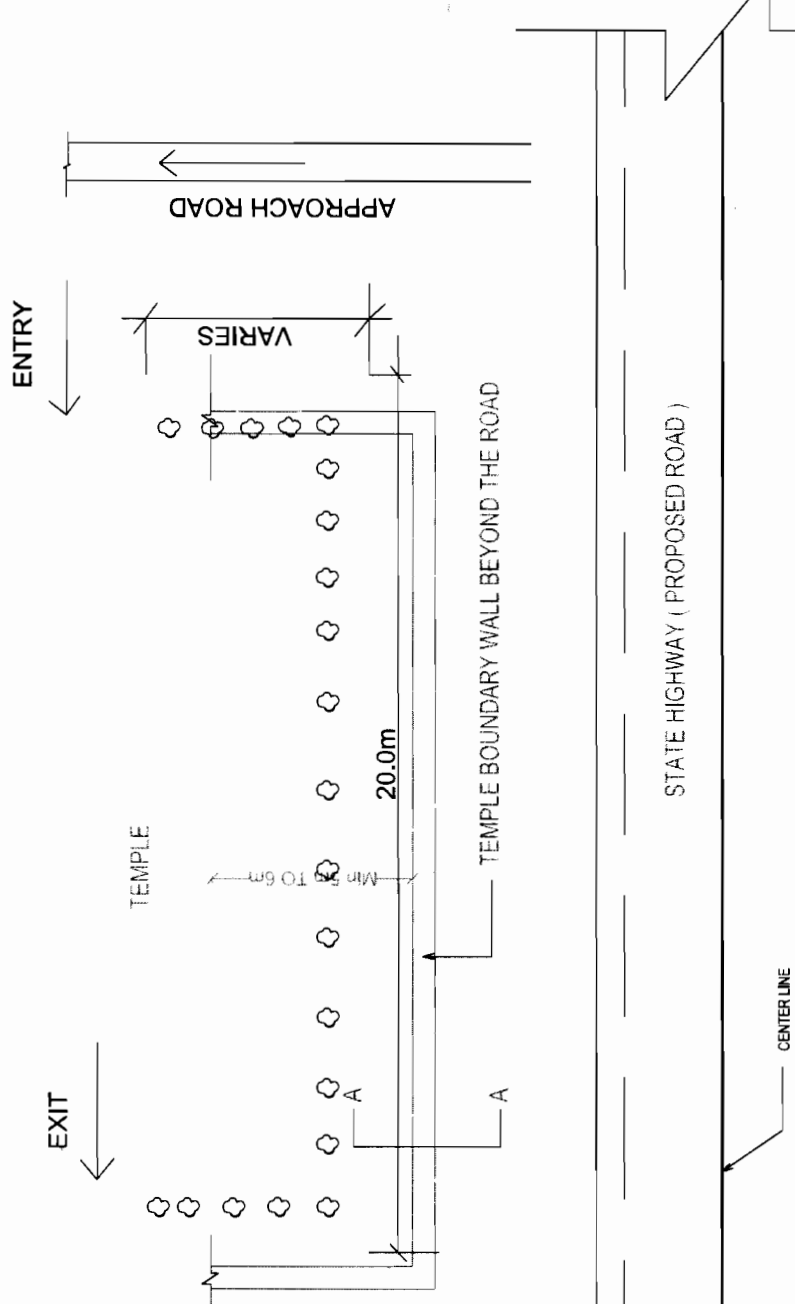
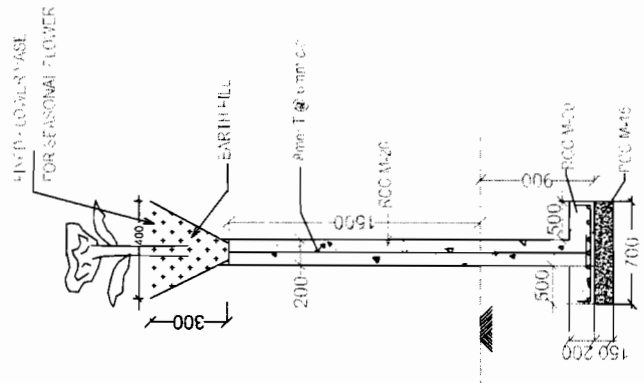
PROJECT :-

ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE.

TYPICAL PCC TOE WALL FOR

WATER BODIES AS ENVIRONMENTAL MITIGATION.

JRC NO.	OSRP/CEG/ENV/03	REV. R0	REV. R1	APPROVED
SH. NO.	61	DATE	PREPARED BY :	EE/PNU
SCALE		REV. R0	CEG Ltd.,	CE, World Bank Projects.
		REV. R0	NTS	



Chainage at km	Location Left/Right
3.3	L
4.75	R
7.15	R
11	R
14.7	R
18	L
23.6	L
30.9	R
37.15	L
34.2	L
34.438	L

- ALL RELOCATED TEMPLES TO HAVE ENTRY AND EXIT AWAY FROM ROAD AND ROW
 - EVERGREEN SHRUBS & MEDIUM TREES LIKE TAGAR, TARAT, MANDAR, PLUMERIA NICTANTHES, MALLIKA, JASHMINE, KUNDA, KANCHAN, KARABIRA, TULSI, BELA, SHAMI, ASHOK (saraca asoka), KAMINI, NAGESWAR AND CHAMPA [PLANT TO PLANT SPACE 1.5m TO 2.0m DEPENDING ON THE SPECIES]
- FIXED FLOWER VASE ON THE BOUNDARY WALL FOR SEASONAL FLOWER & TULSI.

PROJECT :-
ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE.

CONCEPTUAL RCC BOUNDARY WALL OF TEMPLES, STATUES RELIGIOUS TREES AS SITE ENHANCEMENT UNDER ENVIRONMENT MITIGATION PLAN.

DRG NO. OSR/PC/ENV/104-A
SH. NO. 62
SCALE NTS

REV. R0
REV. R1
REV. R2
REV. R3
REV. R4
REV. R5
REV. R6
REV. R7
REV. R8
REV. R9
REV. R10
REV. R11
REV. R12
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REV. R98
REV. R99
REV. R100

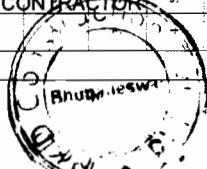
PREPARED BY : EE/PMU
APPROVED : CE World Bank Projects.



SCHEDULE FOR NOISE & DUST BARRIER

Sl. No.	Structure	Chainage at km	Structure	Chainage at km	Location Left / Right
1	SCHOOL	0.3	R		
2	SCHOOL	3.5	R		
3	SCHOOL	7.8	R		
4	SCHOOL	10.26	L		
5	SCHOOL	14.50	L		
6	SCHOOL	20.8	R		
7	SECTION	34.5	L		
8	SCHOOL	34.35	R		
9	SCHOOL	36.675	L		
10	SCHOOL	38.57	L		

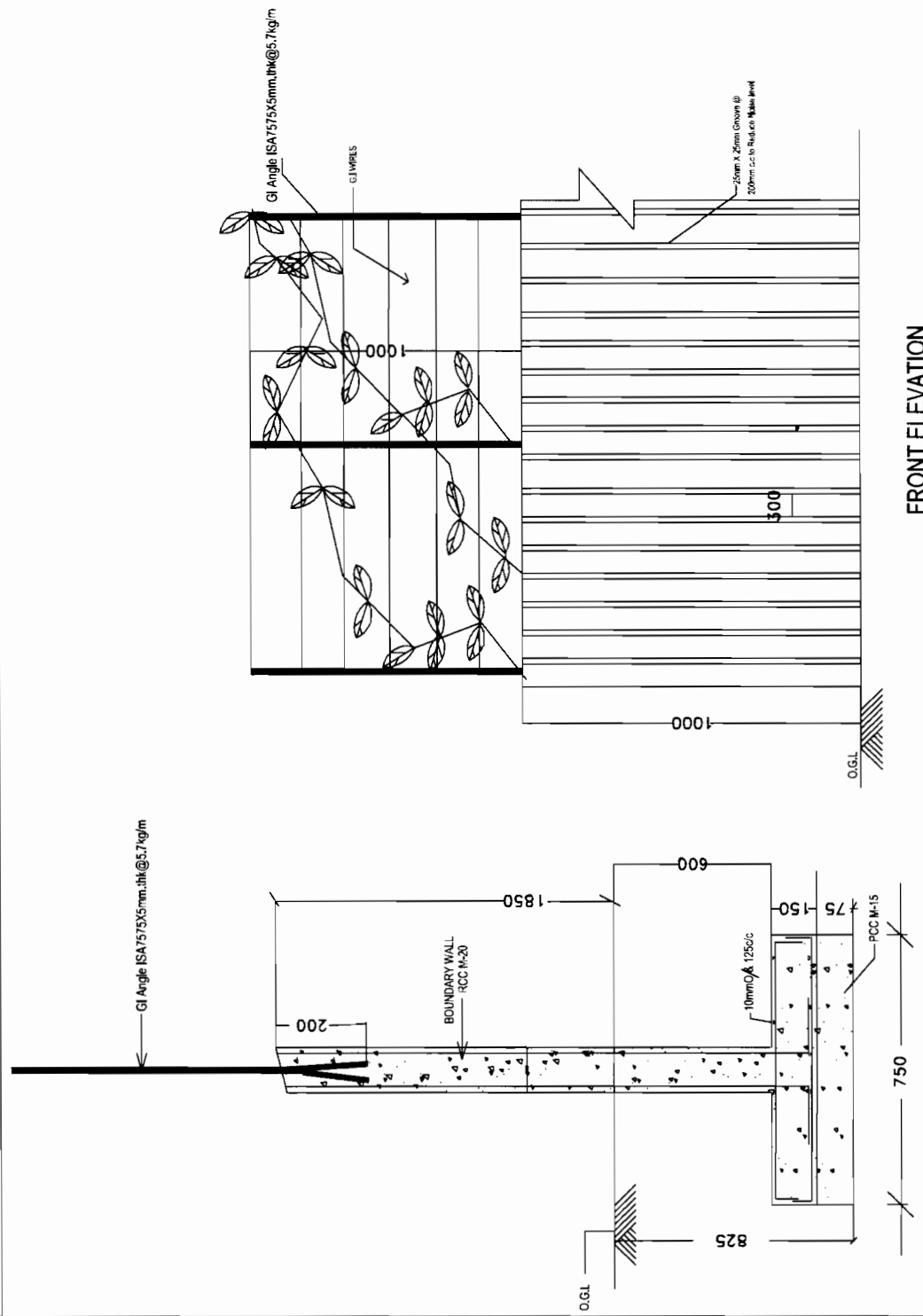
M/s R&D Construction CONTRACTOR



Sl. No.	Structure	Chainage at km	Location Left / Right
11	Forest Check gate	24.6	R
12	Forest Check gate	36.948	R
13	Forest Range Office	36.908	R
14	Inspection Hong low	36.286	L
15	OFFICE	13.575	L
16	Burial Ground	2.115	R
17	Canal Bound	36.15	L

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Annexure - II

Engineer
World Bank Project
Odisha
Bhubaneswar.



FRONT ELEVATION

RCC BOUNDARY WALL FOR SENSITIVE RECEPTORS WITH NOISE & DUST REDUCTION ARRANGEMENT

RCC BOUNDARY WALL FOR SCHOOL (CROSS SECTION)

PROJECT :-

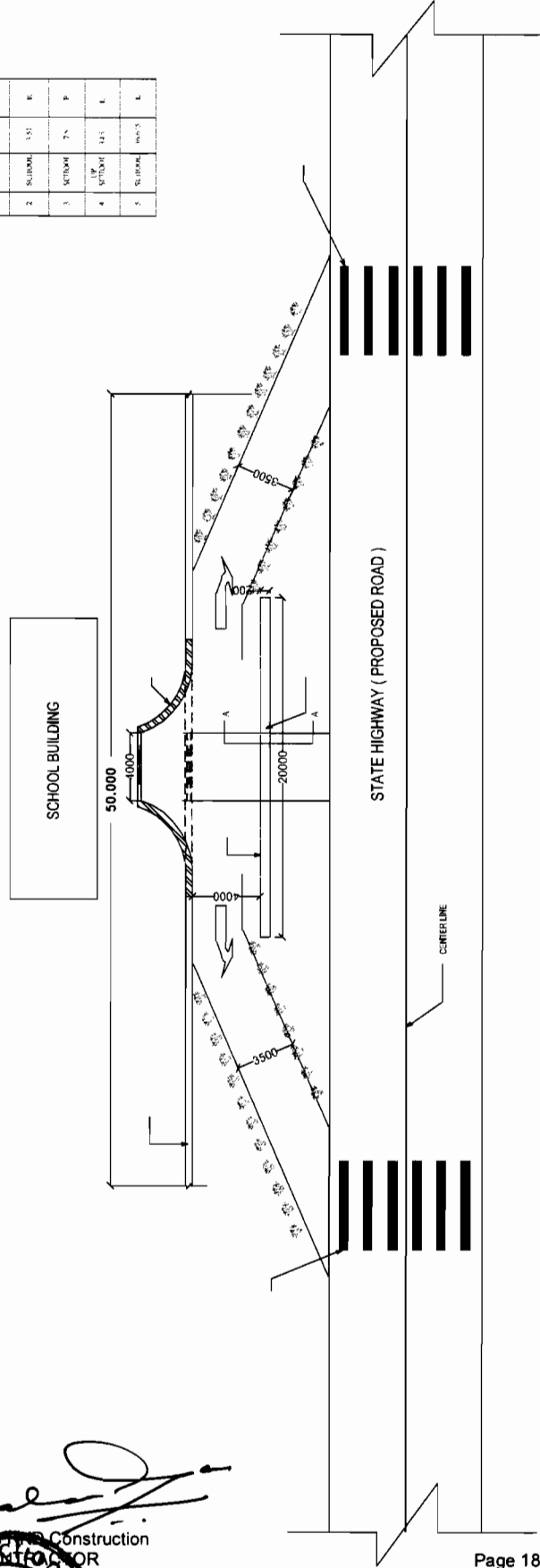
ORISSA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE.

TYPICAL NOISES & DUST BARRIER FOR ENVIRONMENTAL MITIGATION.

DRG NO.	OSR/CEGEN/V04-B	REV. RD	REV. R1	APPROVED
SH. NO.	03	DATE	PREPARED BY	EE/PMU
SCALE	G.P.M.	CEC Ltd.,		CE World Bank Projects.

REVISIONS FOR WORKING DRAWING

Sl. No.	Description	Change Order No.	Author	Checked	Date
1	ADDITION	003	P		
2	SUBSTITUTION	151	E		
3	ADDITION	7	P		
4	ADDITION	145	E		
5	SUBSTITUTION	100/3	E		



- THERE SHALL BE RUMBLER STRIPS & SPEED BREAKERS 150m & 10m AWAY FROM PEDESTRIAN CROSSINGS NEAR SCHOOLS, COLLEGES, HOSTELS, TEMPLES, HOSPITALS, DISPENSARIES AND OLD AGE HOMES, WEEKLY MARKET COMPLEX ADJACENT TO THE ROAD WITHIN 25m TO 50m DISTANCE FROM CENTRE LINE. THE BOUNDARY WALL SHOULD HAVE G.I ANGLE POSTS WITH G.I WIRE MESH GRILL/ STRINGS FOR GROWING CREEPERS TO MUFFLE NOISE AND DUST.
- CREEPERS WITH SCENTED/COLOURFUL FLOWERS TO BE PLANTED WHICH HAVE TOMENTOSE LEAVES TO ABSORB MORE DUST AND NOISE.
- THE BOUNDARY WALL PLASTERING TO HAVE VERTICAL GROOVES TO DEFELECT NOISE TOWARDS THE ROAD WHICH WILL ACT AS A COUNTER NOISE SOURCE TO DAMPEN THE HIGH WAY NOISE LEVEL.
- VEGETATIVE SHRUBS AND BUSHES WHICH ARE NON BROWSABLE AND HAVING SCENTED FLOWERS TO BE PLANTED ON THE PERIPHERY OR EDGE OF THE APPROACH ROAD TO SUCH PLACES. THE BOUNDARY ENTRY POINT TO BE SHIFTED IN WORDS IN CASE OF CLOSE WITH NAME OF THE INSTITUTION ENGRAVED.
- PROXIMITY AND DIRECT ENTRY TO THE ROAD WITH AND A BARRICADE WALL SHALL BE ERECTED 4m AWAY FROM THE ENTRY POINT IN FRONT OF THE GATE

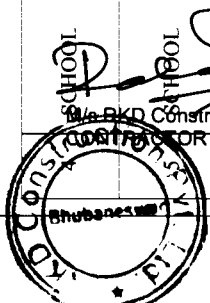
PROJECT :-		ORISSA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE.		CONCEPTUAL APPROACH DESIGN FOR EDUCATIONAL AND MEDICAL INSTITUTIONAL APPROACHES AS ENVIRONMENTAL MITIGATION PLAN.	
DRG. NO.	OSR/PC/CE/ENV/005	REV. NO.	RD	REV. RD	APPROVED
S.I. NO.	84	DATE	REV	PREPARED BY :	EE/PNU
SCALE			NTS	CEC Ltd.,	CE, World Bank Projects.

[Signature]
 Ms. J. Construction
 SUPERVISOR
 Bhubaneswar

Chief Engineer
 World Bank Projects, Odisha
 EMPLOYER
 Chief Engineer
 World Bank Project
 Page 107 of 135
 O/o the E.I.C. (Civil), Odisha
 Bhubaneswar.

SCHEDULE OF GATES

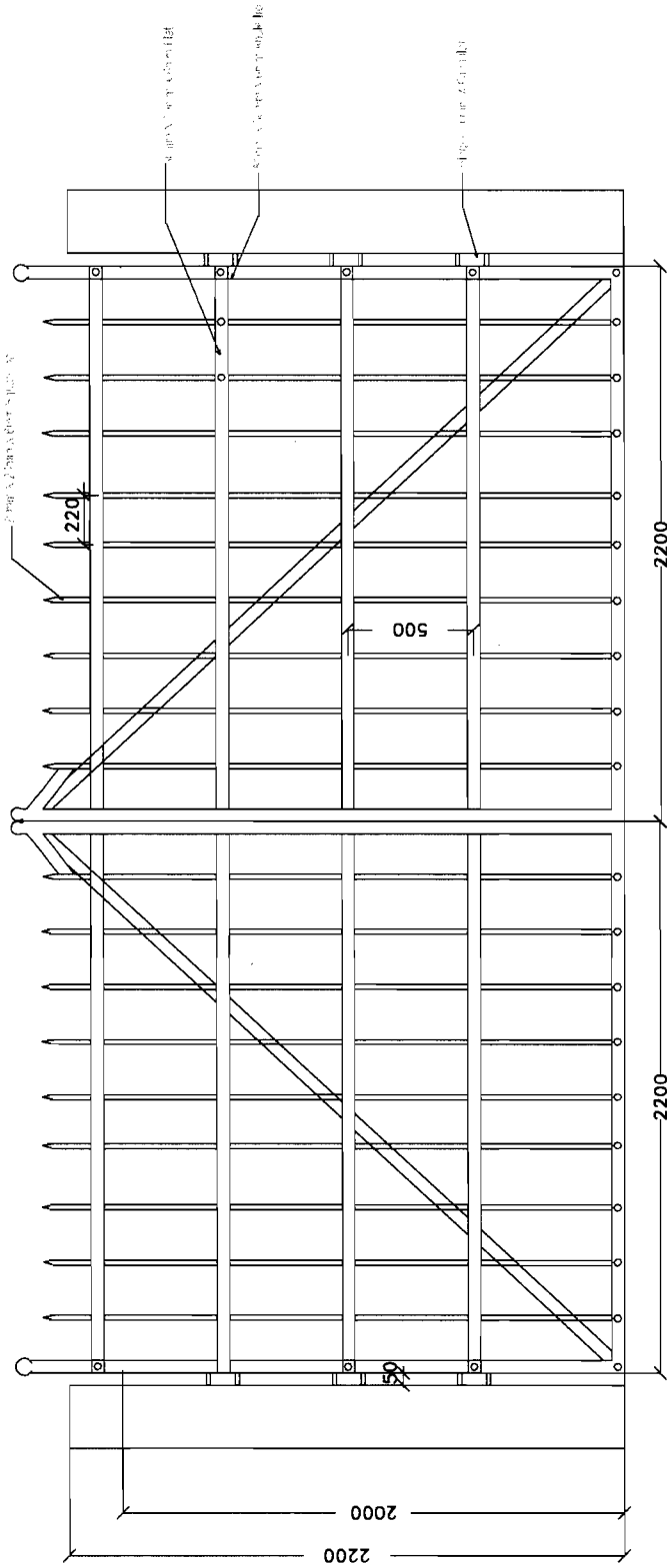
SCHOOL	10.26	L
SCHOOL	13.654	L
SCHOOL	20.8	R
UP SCHOOL	34.5	L
SCHOOL	34.35	R
SCHOOL	36.675	L
SCHOOL	38.547	L
Forest Check gate	24.6	R
Forest Check gate	36.948	R
Forest Range Office	36.908	R
Inspection along low	36.286	L
Inspection	36.286	L



Page 181

Annexure - II

Chief Engineer
World Bank Project
Odisha
Bhubaneswar.



Suitable locking arrangements to be made during fabrication.

ORNAMENTAL GATE

PROJECT :-

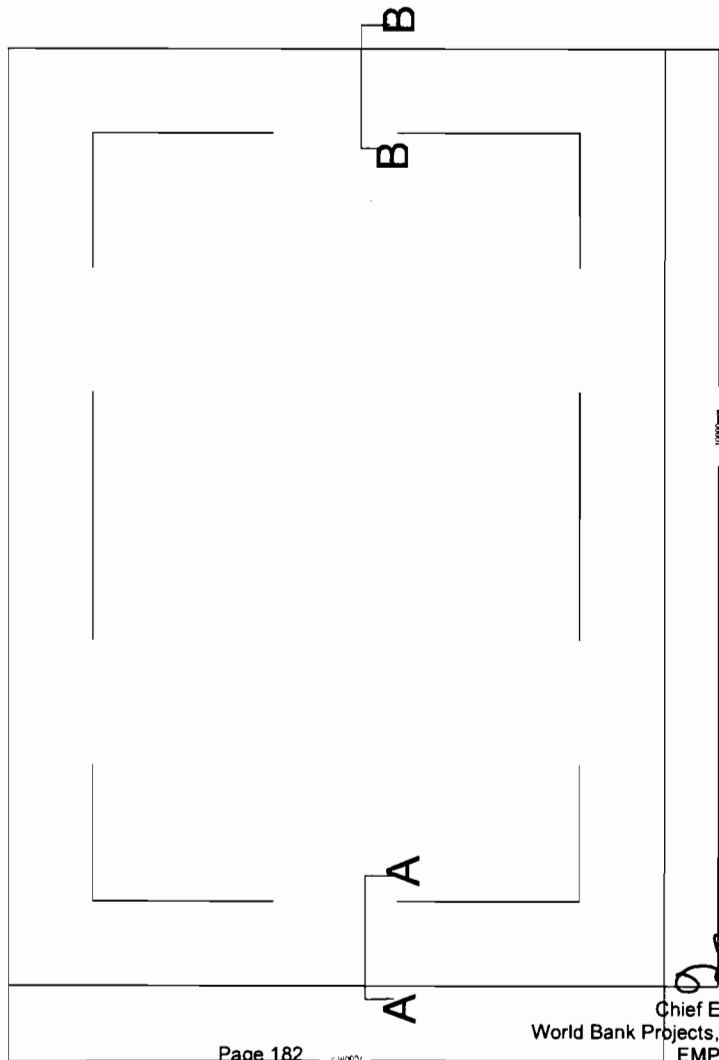
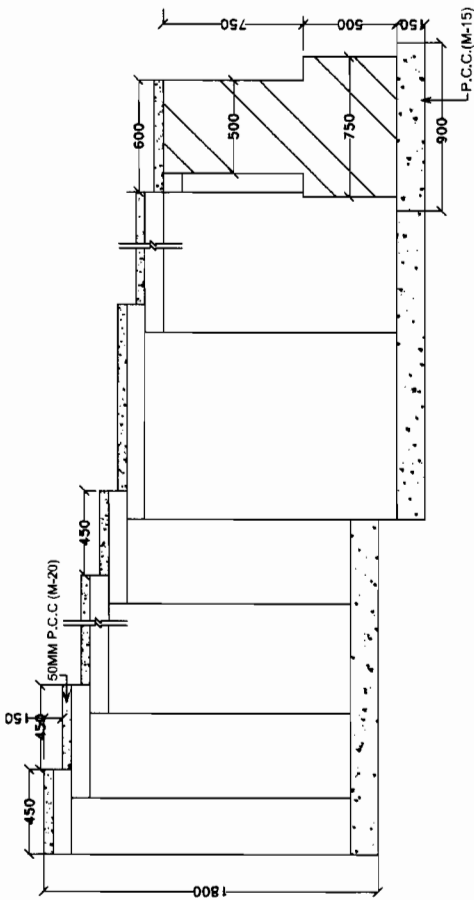
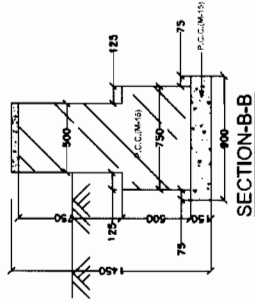
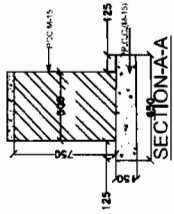
ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE.

ORNAMENTAL GATE DESIGN FOR EDUCATIONAL AND MEDICAL
INSTITUTIONAL APPROACHES AS ENVIRONMENTAL MITIGATION PLAN.

DRG NO.	OSRP/CEG/ENV/05 A	REV. R0	REV. R1	APPROVED
SH. NO.	66	PREPARED BY	EE/PMU	CE, World Bank Projects.
SCALE	NTS			

SCHEDULE FOR BATHING GHAT

SI No.	Chainage at km	Location left /right	Length of toe wall in Mtrs.
1	1.97	R	110
2	3.65	L	17
3	5.00	R	30
4	5.55	L	55
5	6.07	L	60
6	7.22	L	50
7	7.38	R	40
8	10.88	L	65
9	11.90	L	40
10	17.12	L	55
11	18.63	L	30
12	19.29	L	250
13	19.74	L	40
14	20.86	L	95
15	22.56	L	40
16	25.12	L	75
17	30.68	R	220
18	30.85	L	51
19	32.13	R	94
20	34.02	L	56
21	34.66	L	76
22	34.75	L	65
23	36.20	L	76
24	36.23	R	46
25	39.32	R	70
26	40.20	R	90



TYPICAL BATHING GHAT FOR WATER BODIES AS ENVIRONMENTAL MITIGATION.

DRG NO.	OSR/PC/GEN/V08	REV. R0	APPROVED
SH.NO.	61	REV. R1	PREPARED BY :
SCALE		EE/PMU	CE, World Bank Projects.

PROJECT :-
ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE.

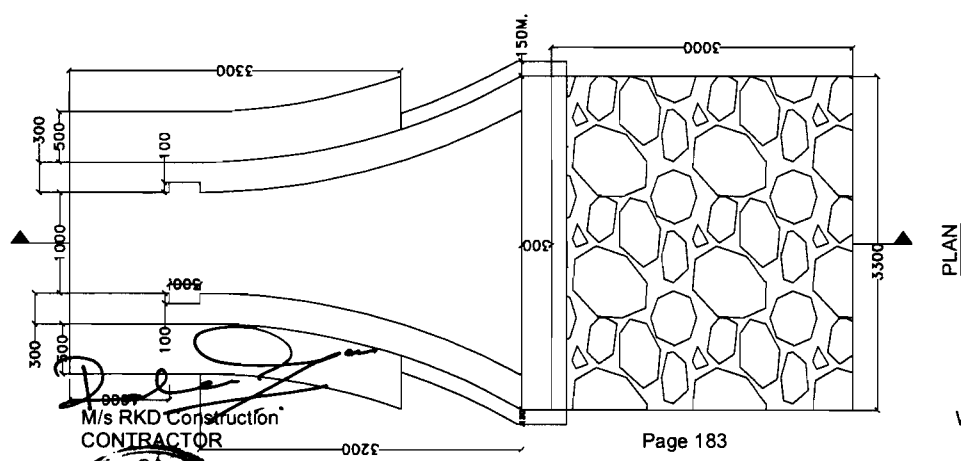
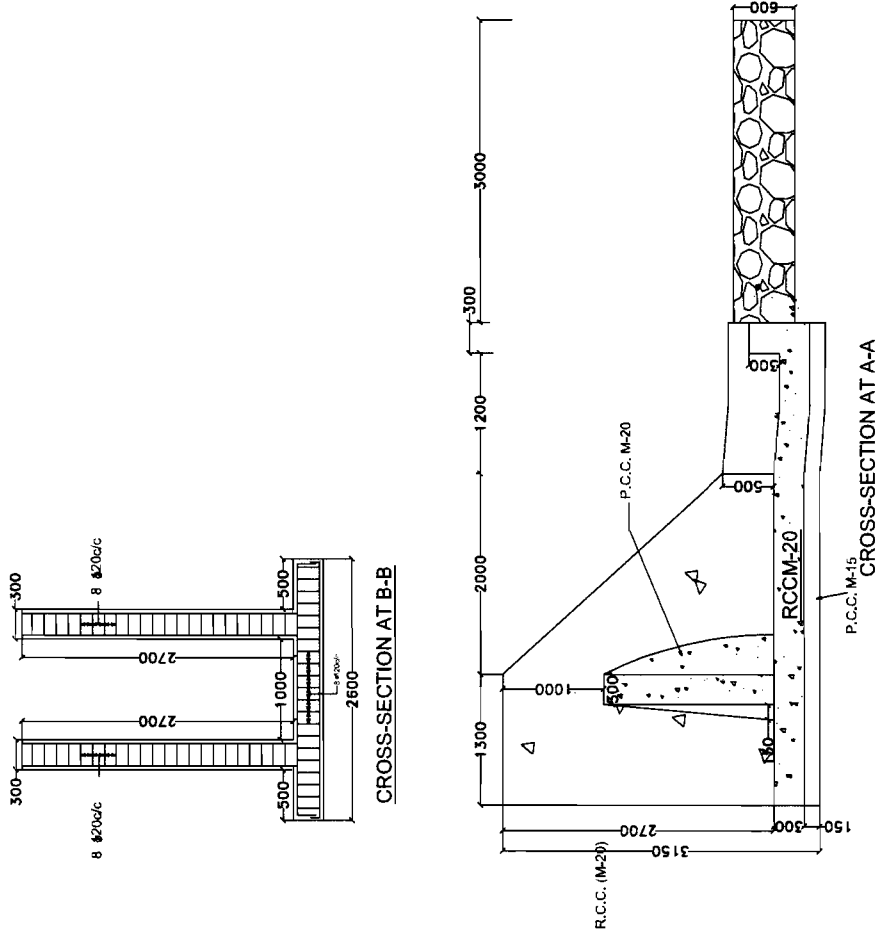
[Signature]
Mr. RKD Construction
CONTRACTOR

[Signature]
Chief Engineer
World Bank Projects, Odisha
EMPLOYER

Page 182 of 188
O/o the E.I.C. (Civil), Odisha
Bhubaneswar.

SCHEDULE FOR SPILLWAY

SI No.	Chainage at km	Location left /right	Length of toe wall in Mtrs.
1	1.97	R	110
2	3.65	L	17
3	5.00	R	30
4	5.55	L	55
5	6.07	L	60
6	7.22	L	50
7	7.38	R	40
8	10.88	L	65
9	11.90	L	40
10	17.12	L	55
11	18.63	L	30
12	19.29	L	250
13	19.74	L	40
14	20.86	L	95
15	22.56	L	40
16	25.12	L	75
17	30.68	R	220
18	30.85	L	51
19	32.13	R	94
20	34.02	L	56
21	34.66	L	76
22	34.75	L	65
23	36.20	L	76
24	36.23	R	46
25	39.32	R	70
26	40.20	R	90



M/s RKD Construction
CONTRACTOR

PLAN

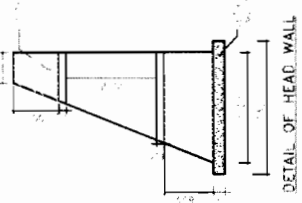
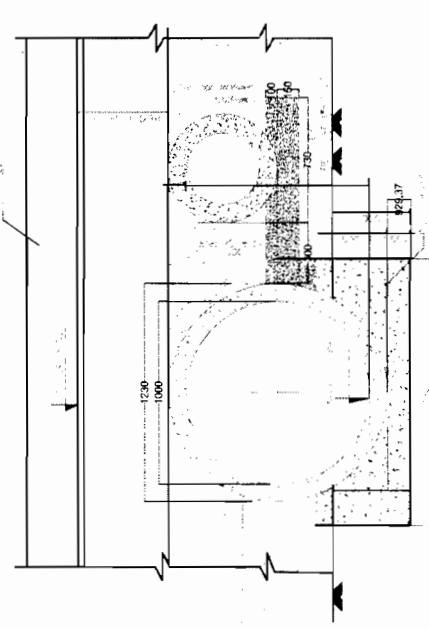
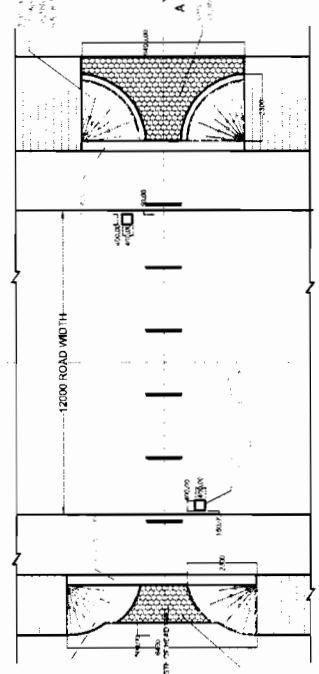
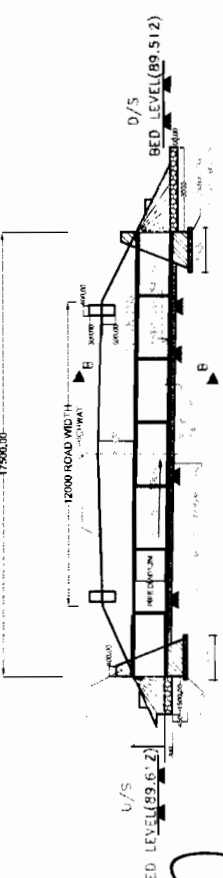
Chief Engineer
World Bank Projects, Odisha
EMPLOYER
Chief Engineer
World Bank Projects
O/o the E.I.C.(Civil), Odisha
Bhubaneswar.

PROJECT :-

ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE.

CONCEPTUAL DESIGN FOR SPILLWAY GATE

DRG NO.	OSR/ICE/ENV/10	REV. R0	APPROVED
SH. NO.	70	DATE	REV. R1
SCALE	NTS	PREPARED BY	EE/PMU
		CEC Ltd.,	CE, World Bank Projects



NOTES:
 1. ALL UTILITIES TO BE PROVIDED AS PER THE ATTACHED DRAWINGS.
 2. THE UTILITIES TO BE PROVIDED AS PER THE ATTACHED DRAWINGS.
 3. THE UTILITIES TO BE PROVIDED AS PER THE ATTACHED DRAWINGS.
 4. THE UTILITIES TO BE PROVIDED AS PER THE ATTACHED DRAWINGS.
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 9. THE UTILITIES TO BE PROVIDED AS PER THE ATTACHED DRAWINGS.
 10. THE UTILITIES TO BE PROVIDED AS PER THE ATTACHED DRAWINGS.

S. No	Location/Drainage Channel	Utility Details		Type of Proposed Culvert
		Proposed Arrangement	Details	
1	0/7/82	367	2 x 1.0	Pipe with Utility
2	0/7/82	367	2 x 1.0	Pipe with Utility
3	2/7/46	2137	1/23/0	RCC Box with Utility
4	2/7/46	2332	2 x 1.0	Pipe with Utility
5	2/7/46	2332	2 x 1.0	Pipe with Utility
6	7/7/46	2332	2 x 1.0	Pipe with Utility
7	7/7/46	2332	2 x 1.0	Pipe with Utility
8	7/6/36	2555	1 x 1.0	Pipe with Utility
9	7/6/36	2555	1 x 1.0	Pipe with Utility
10	8/7/10	2093	2/23/0	RCC Box with Utility
11	13/6/00	13619	1 x 1.0	Pipe with Utility
12	18/1/05	18115	2/27/0	RCC Box with Utility
13	20/6/10	20814	2 x 1.0	Pipe with Utility
14	22/7/10	22189	1 x 1.0	Pipe with Utility
15	22/7/10	22189	1 x 1.0	Pipe with Utility
16	23/5/04	22955	1/27/0	RCC Box with Utility
17	24/6/05	24085	1 x 1.0	Pipe with Utility
18	24/6/05	24085	1 x 1.0	Pipe with Utility
19	24/10/26	25056	1/23/0	RCC Box with Utility
20	31/9/40	32126	1 x 1.0	Pipe with Utility
21	33/2/20	34029	2 x 1.0	Pipe with Utility
22	34/7/50	34483	1 x 1.0	Pipe with Utility
23	34/7/50	34483	1 x 1.0	Pipe with Utility
24	36/9/85	36238	1 x 1.0	Pipe with Utility
25	36/9/85	36238	1 x 1.0	Pipe with Utility

DRG NO.	OSRP/CEGMISC/01	REV. R0	REV. R1	APPROVED
SH. NO.	76	DATE	PREPARED BY	EE/PNU
SCALE	NTS	REV. R0	CEC Ltd.,	CE, World Bank Projects.

PROJECT :-
 ORISSA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE.

M/s/RKD Construction
 CONTRACTOR
 Shubaneswar

Chief Engineer
 World Bank Projects, Odisha
 EMPLOYER

Chief Engineer
 World Bank Project
 O/o the E.I.C.(Civil), Odisha
 Bhubaneswar.

GENERAL:

1. THESE NOTES ARE APPLICABLE FOR RCC SLAB BRIDGES.
 2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DRAWING SHALL BE SCALED.

3. DESIGN CRITERIA:

- I THE DESIGN IS ACCORDING TO FOLLOWING CODES:
 - (a) IRC : 5-1998
 - (b) IRC : 6-2000
 - (c) IRC : 21-2000
 - (d) IRC : 78-2000

II THE FOLLOWING LOADS HAVE BEEN CONSIDERED IN THE DESIGN:

- (a) IRC 70R TRACKED & ONE LANE OF CLASS A
- (b) IRC 70R WHEELED & ONE LANE OF CLASS A
- (c) THREE LANE OF CLASS A
- (d) WEARING COAT LOAD OF 2.20 KN/SQ. M.
- (e) TEMPERATURE VARIATION = $\pm 25^{\circ}$

III THE DESIGN ARE APPLICABLE FOR 'MODERATE' CONDITIONS OF EXPOSURE.

4. WEARING COAT SHALL CONSIST OF THE FOLLOWING

- 1. a COAT OF MASTIC ASPHALT 12mm THICK, WITH A PRIME COAT OVER THE TOP OF DECK IS TO BE PROVIDED BEFORE THE WEARING COAT IS LAID.
- 2. 53mm THICK ASPHALT CONCRETE WEARING COAT AS PER CLAUSE 512 OF MOST'S SPECIFICATIONS FOR ROADS AND BRIDGE WORKS (THIRD REV -1995).
- 3. WEARING COAT SHALL BE DISCONTINUED AT EXPANSION JOINT LOCATION. JOINT FILLERS SHALL EXTEND UP TO THE TOP OF WEARING COAT.
- 4. WIDTH OF EXPANSION JOINT HAS BEEN KEPT 20 MM ONLY WHICH DOES NOT CATER FOR ANY ALLOWANCE FOR POSSIBLE TITLING OF ABOUTMENT.
- 5. SUPPORT FOR THE DECK SLAB SHALL PROVIDE A BEARING WIDTH OF 400 MM MEASURED IN A DIRECTION PERPENDICULAR TO SUPPORT.
- 6. NO PUBLIC UTILITY SERVICES SHALL BE CARRIED OUT OVER THE BRIDGE.

CONCRETE

- 1. CONCRETE SHALL BE DESIGN MIX AND SHALL HAVE MINIMUM 28 DAYS CHARACTERISTIC STRENGTH ON 150MM CUBES FOR ALL ELEMENTS OF STRUCTURES AS INDICATED IN DRAWING FOR MODERATE CONDITIONS OF EXPOSURE
- 2. HIGH STRENGTH ORDINARY PORTLAND CEMENT CONFORMING TO IS:8112 OR ORDINARY PORTLAND CEMENT CONFORMING TO IS:269 CAPABLE OF ACHIEVING THE REQUIRED DESIGN CONCRETE STRENGTH SHALL ONLY BE USED.
- 3. THE MINIMUM CEMENT CONCRETE AND WATER CEMENT RATIO IN THE CONCRETE DESIGN MIX SHALL BE 310 KG PER CUM AND 0.45 RESPECTIVELY FOR 'MODERATE' CONDITIONS OF EXPOSURE.
- 4. TO IMPROVE WORKABILITY OF CONCRETE USE OF ADMIXTURES CONFIRMING TO IS: 9103 MAY BE MADE WITH APPROVAL OF ENGINEER INCHARGE.
- 5. AGGREGATE SHALL CONFIRM TO CL 302.3 OF IRC:21-2000

REINFORCEMENT

- 1. ALL REINFORCEMENT SHALL BE HIGH YIELD STRENGTH DEFORMED BARS (GRADE DESIGNATION S 415) CONFORMING TO IS:786

CONFIGURATION IS SHOWN AS :

FOR BAR :
 $\phi 10 @ 200C/C$

Ø DIA OF BAR : SPACING OF BARS

- 2. SPACING GIVEN FOR ALL REINFORCEMENT IS PERPENDICULAR TO BAR UNLESS OTHERWISE SHOWN ON DRAWINGS.

EARTH FILL/EMBANKMENT

- 1. BACK FILLING MATERIAL SHOULD CONFIRM TO CL 305.2 OF M&T&H'S SPECIFICATION (FOURTH REVISION 2001).

WATER

- 1. WATER TO BE USED IN CONCRETING AND CURING SHALL BE CONFORMING TO CLAUSE 302.4 OF IRC 21-2000.

WORKMANSHIP/DETAILING

- 1. MINIMUM CLEAR COVER TO ANY REINFORCEMENT INCLUDING STIRRUPS SHALL BE 50 MM UNLESS OTHERWISE SHOWN IN THE DRAWINGS.
- 2. FOR ENSURING PROPER COVER OF CONCRETE TO REINFORCEMENT SPECIALLY MADE POLYMER COVER BLOCKS SHALL BE USED.

1 CONSTRUCTION JOINTS:

- I THE LOCATION PROVISION OF CONSTRUCTION JOINTS SHALL BE APPROVED BY ENGINEER-IN-CHARGE. THE CONSTRUCTION OPERATION SHALL BE CARRIED OUT CONTINUOUSLY UP TO THE CONSTRUCTION JOINT.
- II THE CONCRETE SURFACE AT THE JOINT SHALL BE BRUSHED WITH A STIFF BRUSH AFTER CASTING WHILE THE CONCRETE IS STILL FRESH AND IT HAS ONLY SLIGHTLY HARDENED.
- III BEFORE NEW CONCRETE IS POURED THE SURFACE OF OLD CONCRETE SHALL BE PREPARED AS UNDER:
 - (a) FOR HARDENED CONCRETE, THE SURFACE SHALL BE THOROUGHLY CLEANED TO REMOVED DEBRIS/LANTANCE AND MADE ROUGH SO THAT $\frac{1}{4}$ OF THE SIZE OF THE AGGREGATE IS EXPOSED.
 - (b) FOR PARTIALLY HARDENED CONCRETE, THE SURFACE SHALL BE TREATED BY WIRE BRUSH FOLLOWED BY AN AIR JET.
 - (c) THE OLD SURFACE SHALL BE SMOOTH WITH WATER WITHOUT LEAVING PUDDLES IMMEDIATELY, BEFORE STARTING CONCRETING TO PREVENT THE ABSORPTION OF WATER FROM NEW CONCRETE.
- IV NEW CONCRETE SHALL BE THOROUGHLY COMPACTED IN THE REGION OF THE JOINT.

3 WELDING OF REINFORCEMENT BARS SHALL NOT BE PERMITTED.

4 LAPS IN REINFORCEMENT:

- 1. MINIMUM LAP LENGTH OF REINFORCEMENT SHALL BE DECIDED AS PER THE REINFORCEMENT ARRANGEMENT BASED ON THE CLAUSE - 304.6.6 OF IRC:21-2000.
- II NOT MORE THAN 50 % OF REINFORCEMENT SHALL BE LAPPED AT ANY ONE LOCATION

- 5. BENDING OF REINFORCEMENT BARS SHALL BE AS PER IS:2502
- 6. SUPPORTING CHAIRS OF 12 MM DIAMETER SHALL BE PROVIDED AT SUITABLE INTERVALS AS PER IS:2502.

- 7. CONCRETE SHALL BE PRODUCED IN A MECHANICAL MIXER OF CAPACITY NOT LESS THAN 200 LIT. HAVING INTEGRAL WEIGH-BATCHING FACILITY AND AUTOMATIC WATER MEASURING AND DISPENSING DEVICE.

- 8. PROPER COMPACTING OF CONCRETE SHALL BE ENSURED BY USE OF FORM AND/OR NEEDLE VIBRATORS. USE OF FULL WIDTH SCREED VIBRATORS FOR COMPACTING OF CONCRETE IN DECK SLAB SHALL BE ENSURED.

- 9. PROPERLY BRACED STEEL PLATES SHALL BE USED AS SHUTTERING.

- 10. SHARP EDGES OF CONCRETE SHALL BE CHAMFERED.

- 11. FILTER MEDIA SHOULD BE PROVIDED IN ACCORDANCE TO CLAUSE 2504.2.2 OF MOST SPECIFICATIONS (FOURTH REV. 2001).

- 12. IN PRESENCE OF SOIL WITH AGGRESSIVE SOIL CONDITION, THE CONCRETE FACES IN CONTACT WITH EARTH SHALL BE PROTECTED WITH APPROVED BITUMINOUS PAINT OR COATING AS DECIDED BY THE ENGINEER-IN-CHARGE.

GENERAL SPECIFICATIONS:

- 1. THE WORK SHALL BE EXECUTED IN ACCORDANCE WITH M&T&H'S SPECIFICATION FOR ROAD AND BRIDGE WORKS (FOURTH REVISION 2001) EXCEPT WHEREVER OTHERWISE MENTIONED.

FOUNDATION :-

- 1. FOR OPEN FOUNDATIONS RESTINGS ON ROCKS THE MINIMUM DEPTH OF EMBEDMENT SHALL BE 0.6 M FOR HARD ROCK WITH ULTIMATE CRUSHING STRENGTH OF 10 MPa OR ABOVE AND 1.5 M FOR OTHER TYPE ROCKS.

- 2. IN CASE OF EXCAVATION IN ROCK, THE TRENCHES AROUND THE FOOTING SHALL BE FILLED UP WITH CEMENT CONCRETE OF M-15 GRADE UP TO THE TOP OF THE ROCK. DEPTH OF FILL IN EXCESS OF 1.5 M IN SOFT ROCK OR 0.6 M IN HARD ROCK MAY BE FILL BY CONCRETE OR BY BOULDERS GROUTED WITH CEMENT.

DATE: 10/05/2011	SCALE: 1:100
PROJECT: ORISSA STATE ROAD PROJECT	SECTION: UNDER WORLD BANK ASSISTANCE
DESIGNER: M/S. BKT CONSTRUCTION	CHECKED: [Signature]
DRAWN: [Signature]	DATE: 10/05/2011

GENERAL NOTES
 (FOR RCC SLAB BRIDGES)

ORISSA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE

Chief Engineer
 World Bank Projects, Odisha

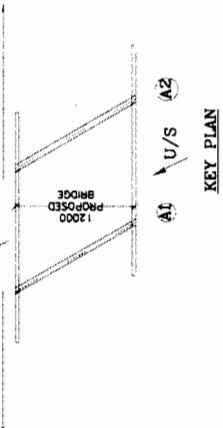
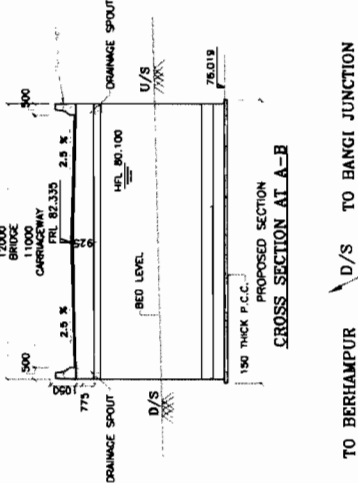
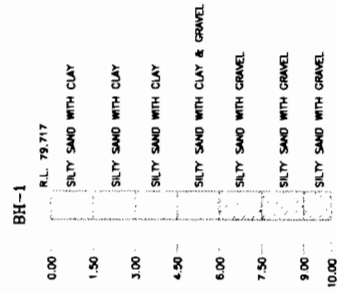


NOTES:-

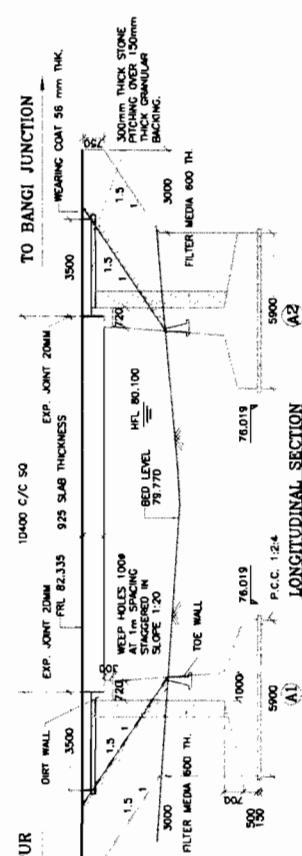
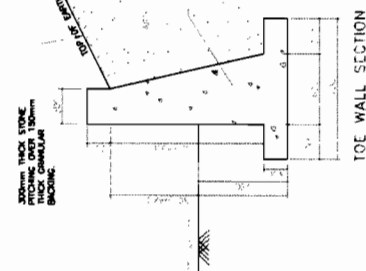
- 1 ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED. LEVELS ARE IN METERS.
- 2 DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- 3 THE CROSS SAFE BEARING CAPACITY OF SOIL AT THE PROPOSED FOUNDATION OF THE ABUTMENTS, RETURN WALL IN NO CASE BE LESS THAN 20.31 T/M²
- 4 GRADE OF CONCRETE :
OPEN FOUNDATION - M-20
ABUTMENT CAP - M-20
DIRT WALL - M-20
APPROACH SLAB - M-30
SOLID SLAB - M-30
CRASH BARRIER - M-40
RETURN WALL - M-20
- 5 REINFORCEMENT H.V.S.D. BARS IS CONFORM TO IS:1786 GRADE - Fe-415.
- 6 FOR DETAIL OF CRASH BARRIER REFER CIRCO.
- 7 TAP PAPER BEARING SHALL BE USED.
- 8 THE SLAB STRUCTURE REFER HOSE FORWARD DRAWING FOR DIMENSIONS FOR M.C.C. SOLID SLAB STRUCTURE (15' & 30' SHOW) CIRCO. NO. 50/172
- 9 THE BRIDGE HAS BEEN DESIGNED FOR ONE LANE OF T.P.C. CLASS 70-KT-CLASS A VEHICLE AND 3 LANES OF T.P.C. CLASS 70-KT-CLASS B VEHICLE WHICH EVER WILL PRODUCE THE WORST EFFECT.
- 10 ADEQUATE NOS. OF WEEP HOLES SHALL BE PROVIDED IN THE ABUTMENT & RETURN WALL AS PER I.S.C. SPECIFICATION.
- 11 BACK FILL PARAMETERS ASSUMED ARE C-0 & ϕ 30'.
- 12 CLEAR COVER TO ANY REINFORCEMENT IN BASE SLAB = 75mm
IN ALL OTHER COMPONENTS = 40mm
- 13 FOR DETAIL OF RETURN WALL REFER DRAWING NO. OSRP/CEG/RW/MISC-02

REFERENCE DRAWING:-

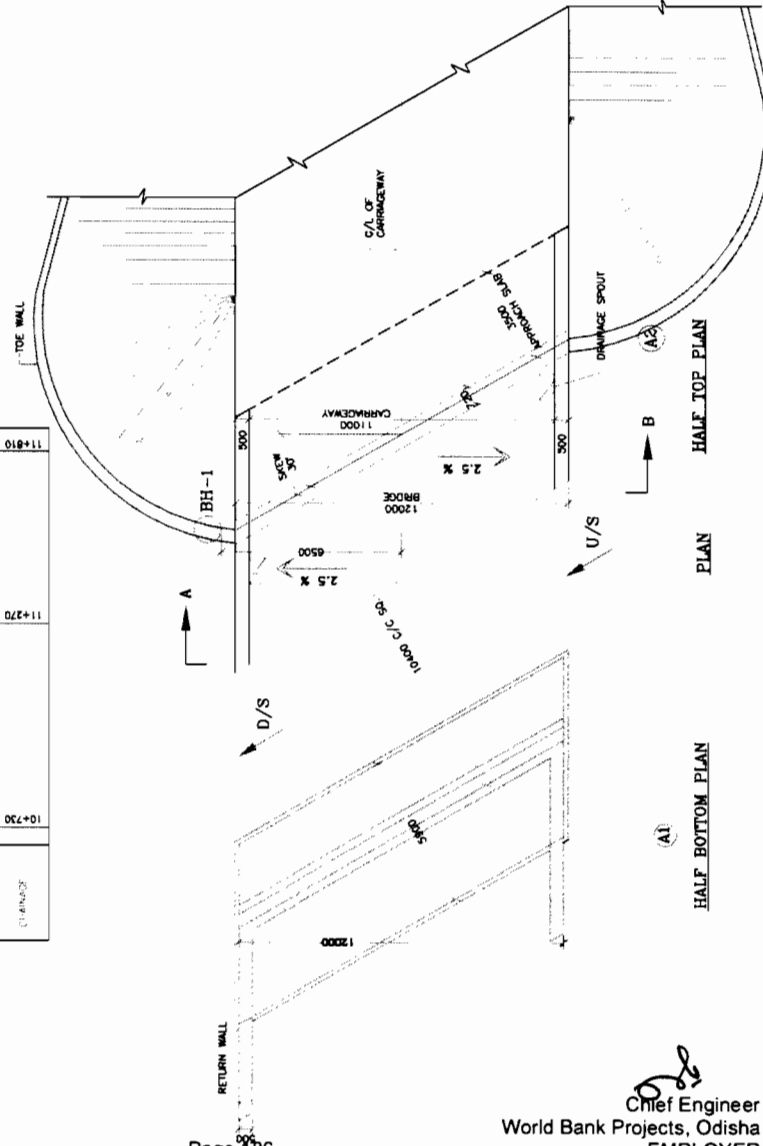
- 1 OSRP/CEG/SH-17/BR/11+270/01
- 2 OSRP/CEG/SH-17/BR/11+270/02
- 3 OSRP/CEG/SH-17/BR/11+270/03



Design Depth (in meters)	Design Velocity (in m/sec)	Waterway (in Meter)	Max. Flood Level (in meters)	F.H.L. (in meters)	Corresponding Level (in meters)
5.39	1.15	9.6	76.608	76.717	76.619



CHAMBER NOS. (m)	HEL. (m)	CHAMBER LENGTH (m)
11+810	80.316	82.335
11+270	79.770	82.335
10+740	80.142	82.335



TO BERTAMPUR

 M/s RKD Construction
 CONTRACTOR

Chief Engineer
 World Bank Projects, Odisha
 EMPLOYER

ORISSA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE

GENERAL ARRANGEMENT DRAWING
 BRIDGE AT KM 11+270
 (BALIPAPHA / DENGAPADAR)

DRAWING NO. : OSRP/CEG/SH-17/BR/11+270/03
 DATE : FEB. 2012
 REV. NO. :
 PREPARED BY :
 CEG/ML
 REV. R1 :
 PREPARED BY :
 EL/MLU
 APPROVED :
 CE, PWP

NOTES:-

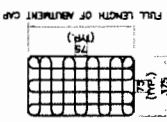
- 1 ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED. LEVELS ARE IN METRES.
- 2 DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- 3 THE GROSS SAFE BEARING CAPACITY OF SOIL AT THE PROPOSED FOUNDATION OF THE ABUTMENTS RETURN WALL IN NO CASE BE LESS THAN 20.31 T/M².
- 4 GRADE OF CONCRETE : OSRP/CEG/SH-17/BR/11+270/01
- 5 REFER DRAWING NO- OSRP/CEG/SH-17/BR/11+270/01
- 6 REINFORCEMENT H.Y.S.D. BARS IS CONFORM TO IS:1796 GRADE - Fe-415.
- 7 TYP PAPER BEARING SHALL BE USED.
- 8 CLEAR COVER TO ANY REINFORCEMENT IN BASE SLAB = 75mm
IN ALL OTHER COMPONENTS = 40mm
- 9 GRADE OF CONCRETE :
OPEN FOUNDATION - M-20
ABUTMENT - M-20
ABUTMENT CAP - M-25
DIRT WALL - M-25

REFERENCE DRAWING:-

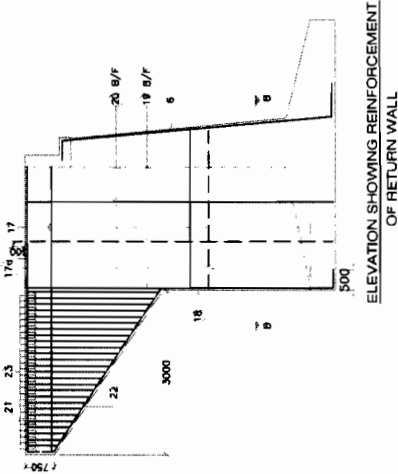
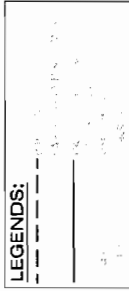
- 1 OSRP/CEG/SH-17/BR/11+270/01
- 2 OSRP/CEG/SH-17/BR/11+270/03

REINFORCEMENT DETAILS:

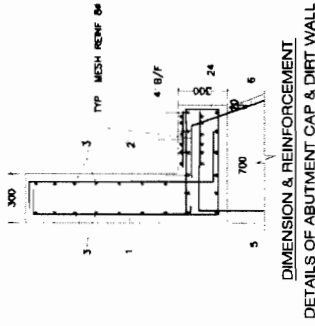
BAR	DIA (mm)	SPACING/NUM	SHAPE
1	12	150	[Diagram]
2	12	150	[Diagram]
3	12	150	[Diagram]
4	12	150	[Diagram]
5	12	150	[Diagram]
6	12	150	[Diagram]
7	12	150	[Diagram]
8	12	150	[Diagram]
9	12	150	[Diagram]
10	12	150	[Diagram]
11	12	150	[Diagram]
12	12	150	[Diagram]
13	12	150	[Diagram]
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49	12	150	[Diagram]
50	12	150	[Diagram]



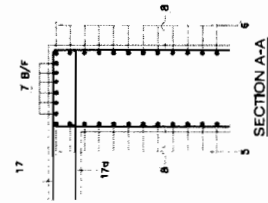
TYP. MESH REINF B&I/O ABUTMENT CAP TO BE PROVIDED IN TWO LAYER 20 MM & 100 MM BELOW ABUTMENT CAP TOP



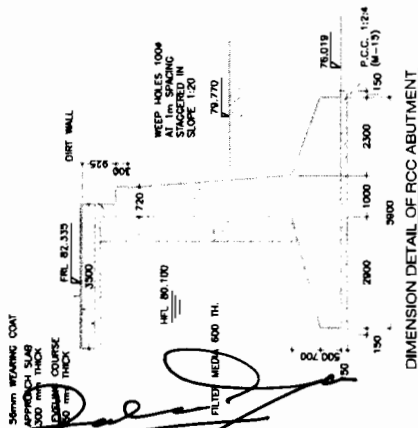
ELEVATION SHOWING REINFORCEMENT OF RETURN WALL



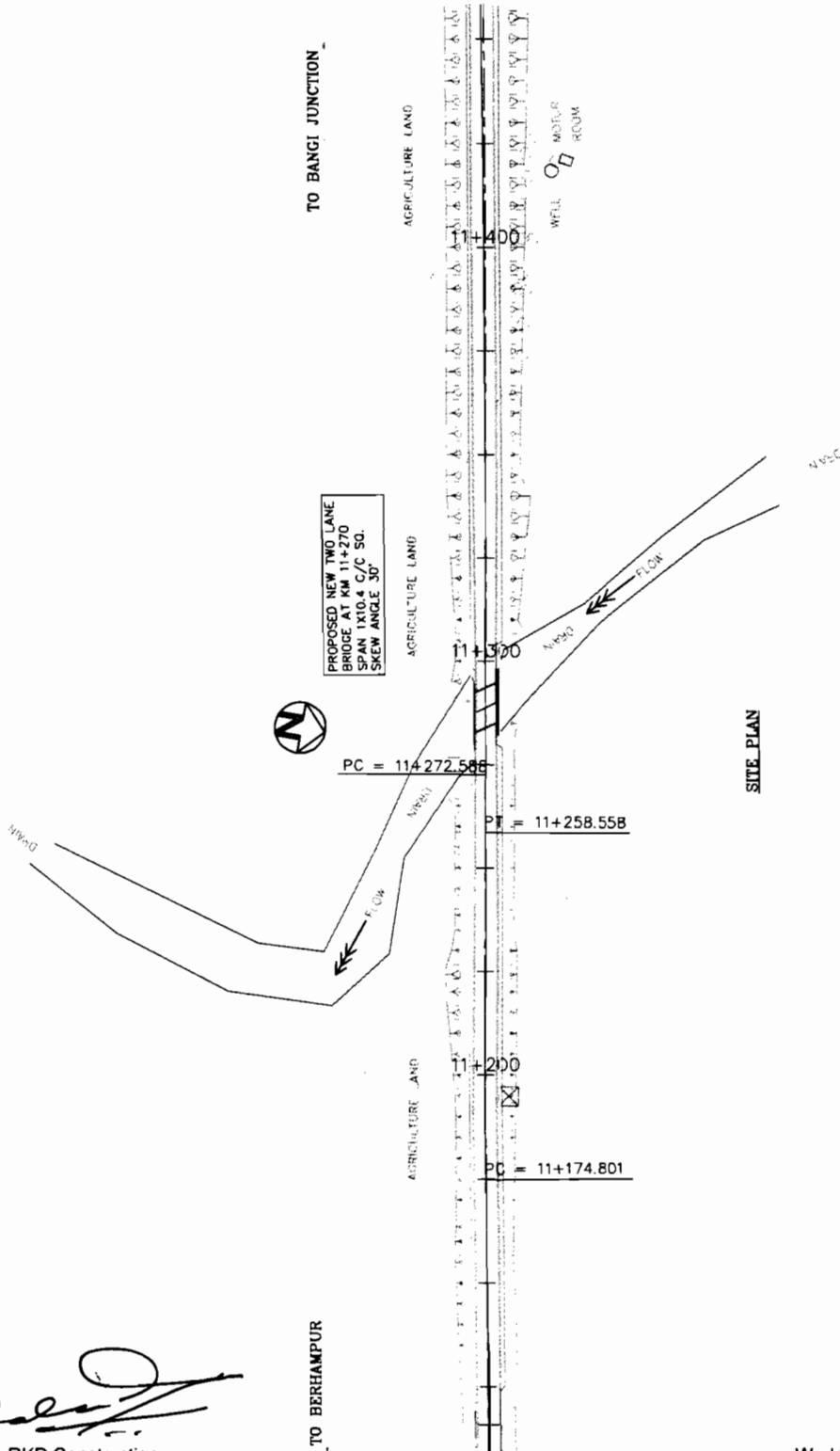
DIMENSION & REINFORCEMENT DETAILS OF ABUTMENT CAP & DIRT WALL



SECTION A-A



NOTES:-



SITE PLAN

DRAWING NO. : OMRP/CE/2011/17/BR/11+270/03	
DATE : FEB. 2012	REV. R1 APPROVED
REV. R0 PREPARED BY : CE/PMU	REV. R1 PREPARED BY : CE, WBP.

SITE PLAN
BRIDGE AT KM 11+270
(BALPARHA / DENGAPADAR)

ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

[Signature]
M/s BKB Construction
Bhubaneswar

[Signature]
Chief Engineer
World Bank Projects, Odisha
EMPLOYER
World Bank Project
Page 138 of 135
O/o Chief Engineer
Bhubaneswar.

NOTES:

REFERENCE DRAWING:--

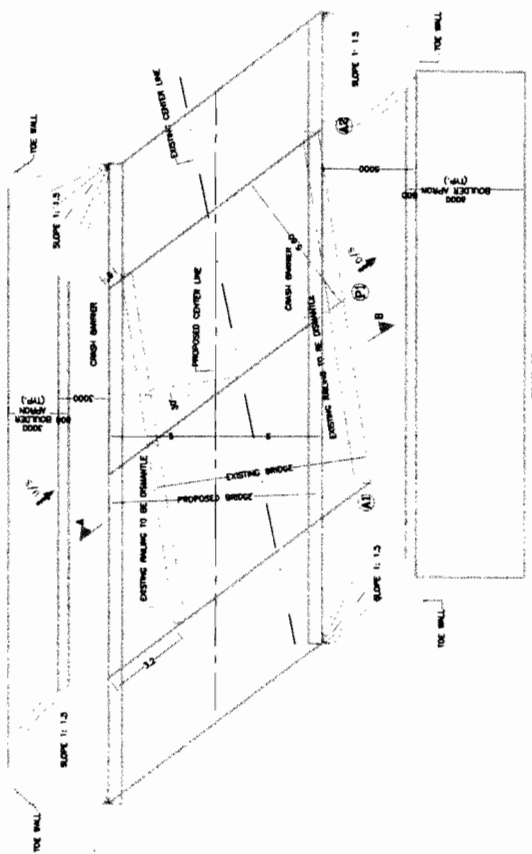
- 1 OSRP/CEG/SH-17/BR/14815/01
- 2 OSRP/CEG/SH-17/BR/14815/03

EXISTING BRIDGE DETAILS	
1	Change
2	Name of the mullah Ambigada Nallah
3	Year of construction 1991
4	Type of bridge High level bridge
5	Existing span arrangement 2 x 6.6 m
6	Existing carriage way width 7.0 m
7	Thickness of superstructure 0.5 m
8	Type of foundation Open foundation
9	Type of substructure P.C.C. solid slab
10	Type of superstructure R.C.C. solid slab
11	Existing formation level 58.344 m
12	Final formation level 58.344 m
13	Bed level 55.753 m
14	Top level of Can 57.663 m
15	Bottom level of Cap 57.263 m
16	Distance of P.C.T. w.r.t E.C.I. (max.) 1.25 m Right

REHABILITATION MEASURES SUGGESTED		
S. no.	Items	Reference Drawings
1	Widening at existing bridge	OSRP/CEG/SH-17/BR/14815/01
2	Superstructure	MSD'S STANDARD DRAWING (PART) BRIDGES (R.C.C. AND S.P.7M) (Proposed carriage way with modified 10.0 m)
3	Curb better	OSRP/CEG/BR/MISC-02
4	Expansion joint	OSRP/CEG/BR/MISC-02
5	Wearing coat	OSRP/CEG/BR/MISC-02
6	Drainage spout	OSRP/CEG/BR/MISC-02
7	Approach slab	OSRP/CEG/BR/MISC-02
8	Retain wall	OSRP/CEG/BR/MISC-02
9	Bearing	-
10	Bed Protection	OSRP/CEG/SH-17/BR/14815/01

TO BANGI JUNCTION

TO BERRAMPUR



Chief Engineer
World Bank Projects, Odisha
Employer
Chief Engineer
World Bank Project
O/o the Chief Engineer, Odisha
Bhubaneswar.

REHABILITATION BRIDGE DETAILS
BRIDGE AT KM 1+915

ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

SCALE OF EXISTING BRIDGE

OSRP/CEG/SH-17/BR/14815/03
REV. NO. 01
REV. BY 17/08/2017
REV. DATE 17/08/2017

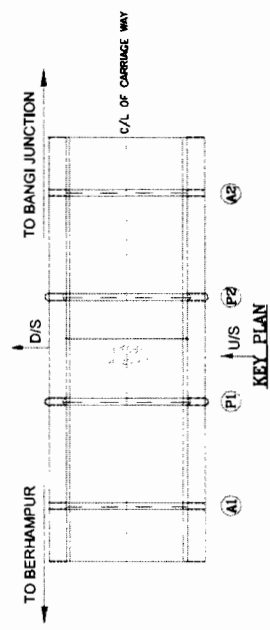
NOTES:

EXISTING BRIDGE DETAILS

1	Change	4400
2	Name of the nullah	Lamin Canal
3	Year of construction	1992
4	Type of bridge	High level Bridge
5	Existing span arrangement	3 x 6.75 m
6	Existing carriage way width	7.5 m
7	Thickness of superstructure	0.5 m
8	Type of foundation	Open foundation
9	Type of substructure	PCC Wall type
10	Type of superstructure	RCC solid slab
11	Existing Formation Level	72.609 m
12	Final Formation Level	72.609 m
13	Bed Level	69.167 m
14	Distance of PCI w.r.t FCI	0.37 m Right

WIDENING AND REHABILITATION MEASURES SUGGESTED

S. no.	Items	Rehabilitation Measures	Reference Drawings
1	Substructure	Existing substructure widened to 12.0m	STANDARD DRAWINGS
2	Superstructure	Existing slab shall be widened to 12.0m	MOST STANDARD DRAWINGS FOR ROAD BRIDGES SD 111
3	Expansion joint	Expansion joint pointed and shall be replaced by filler type Expansion joint	OSRM EG BR.MIS.42
4	Crash Barrier	Railing to be replaced by crash barrier	STANDARD DRAWINGS
5	Wearing coat	Existing wearing coat shall be replaced by C.C. wearing coat	MOST STANDARD PLANS FOR HIGHWAY BRIDGES DMC. NO. SD205
6	Approach slab	Approach slab to be reconstructed	OSR/CS-G.HRN/INSC42
7	Distress on substructure	Reinforcement exposed on pier P2 of area 0.2 m ² to be take care by epoxy mortar	-
8	Vegetation growth	Vegetation to be removed from the structure and bed	-



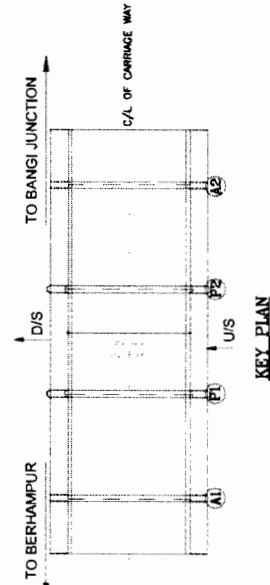
Handwritten signature
 Mr. RK Das
 CONTRACTOR
 R.K.D. CONSULTANTS PVT. LTD.
 Bhubaneswar

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 Chief Engineer
 World Bank Projects, Odisha
 Bhubaneswar
 World Bank Project
 Odisha Civil
 Bhubaneswar

NOTES:

EXISTING BRIDGE DETAILS		
1	Chainage 11/660	
2	Name of the naah/Bijayghana Ghat	
3	Year of construction 1984	
4	Type of bridge High Level Bridge	
5	Existing span arrangement 3 x 6.80	
6	Existing carriage way width 7.5 m	
7	Thickness of superstructure 0.5 m	
8	Type of foundation Open foundation	
9	Type of substructure Coarse Stone Masonry Wall type	
10	Type of superstructure RCC solid slab	
11	Existing Foundation Level 82.874 m	
12	Final Formation Level 82.874 m	
13	Bed Level 78.073 m	
14	Top level of Cap 82.099 m	
15	Bottom level of Cap 81.599 m	
16	Distance of R.C.L. w.r.t E.C.L. 0.186 m Left	
S. no.	Rehabilitation Measures	Reference Drawings
1	Superstructure Existing slab shall be dismantled and new slab shall be constructed	MOST STANDARD DRAWINGS FOR ROAD BRIDGES SP 103 (Proposed slab shall shall be modified to 30.0 m)
2	Substructure Abutment & pier caps shall be dismantled and new caps shall be constructed, widening and jacking shall be done in piers and abutments	OSRP CE/BR/01/41
3	Crash barrier Existing whings shall be dismantled and crash barrier shall be cast	OSRP CE/BR/02/01/42
4	Expansion joint Filler type expansion joints shall be provided	OSRP CE/BR/03/01/42
5	Wearing coat 50mm BK laid over 6mm thick mastic asphalt	OSRP CE/BR/04/01/42
6	Drainage spout Drainage spouts shall be provided on sp. 5m/c/c distance on both sides	OSRP CE/BR/05/01/42
7	Approach slab Approach slab to be constructed	OSRP CE/BR/06/01/42
8	Retain Wall Retain Walls shall be constructed on right side (2 NOS.)	OSRP CE/BR/07/01/42
9	Heaving Tar paper heaving shall be provided	-
10	Vegetation growth Vegetation to be removed from the structure and bed	-

WIDENING AND REHABILITATION MEASURES SUGGESTED



WIDENING & REHABILITATION BRIDGE DETAILS
BRIDGE AT CH. 11+660

ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

DATE: 11/06/2014
SCALE: AS SHOWN
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CHECKED BY: [Signature]

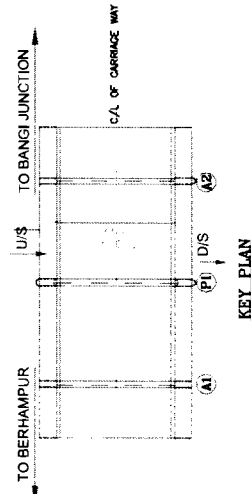
[Signature]
M/s RKD Construction
CONTRACTOR

[Signature]
Chief Engineer
World Bank Projects, Odisha
EMPLOYER
Chief Engineer
World Bank Project
Page 193 of 205
O/o Regional Office, Odisha
Bhubaneswar.

NOTES:

EXISTING BRIDGE DETAILS	
1	Change
2	Name of the bridge
3	Year of construction
4	Type of bridge
5	Existing span arrangement
6	Existing carriage way width
7	Thickness of superstructure
8	Type of foundation
9	Type of substructure
10	Type of superstructure
11	Existing Formation Level
12	Final Formation Level
13	Bed Level
14	Distance of P.C.T. w.r.t. P.C.T.

WIDENING AND REHABILITATION MEASURES SUGGESTED		
S. no.	Items	Reference Drawings
1	Superstructure Existing slab shall be dismantled and new slab shall be constructed	OSR/PC/EG BR/RT-01 OSR/PC/EG BR/MS-C-02 OSR/PC/EG BR/MS-C-02
2	Substructure Abutment & pier caps shall be dismantled and new caps shall be constructed (locking shall be done in piers and abutments)	OSR/PC/EG BR/MS-C-02
3	Crack repair Existing mottings shall be dismantled and crash barrier shall be cast	OSR/PC/EG BR/MS-C-02
4	Expansion joint Expansion joint repair shall be replaced by filler type	OSR/PC/EG BR/MS-C-02
5	Wearing coat Overlay of BT shall be removed and W.C. shall be replaced completely by 50 mm thick bituminous W.C.	OSR/PC/EG BR/MS-C-02
6	Railing Minor touch up repair in railings	OSR/PC/EG BR/MS-C-02
7	Vegetation growth Vegetation to be removed from the structure and bed	OSR/PC/EG BR/MS-C-02



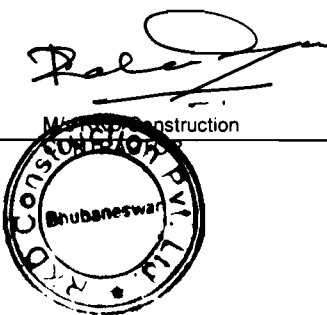
WIDENING & REHABILITATION BRIDGE DETAILS

BRIDGE AT CH. 15+185

PROJECT NO. : ORISSA/OD/11/78/13-13/01	DATE : 08.07.2011
SCALE : AS SHOWN	DATE : 08.07.2011
DESIGNED BY : S. K. SINGH	CHECKED BY : S. K. SINGH
DRAWN BY : S. K. SINGH	DATE : 08.07.2011

ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

SCALE

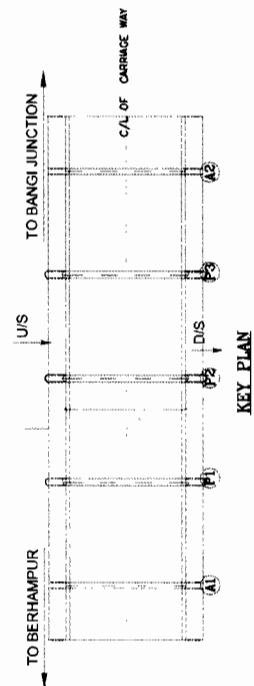


Chief Engineer
World Bank Projects, Odisha

EMPLOYER
Chief Engineer
World Bank Project
O/o the E.P.C. Cell,
Bhubaneswar.

NOTES:

EXISTING BRIDGE DETAILS			
1	Change 15/680		
2	Name of the mallah Gaura Nallah		
3	Year of construction 1988		
4	Type of bridge High Level Bridge		
5	Existing span arrangement 4 x 6.5m		
6	Existing carriage way width 7.5 m		
7	Thickness of superstructure 0.6 m		
8	Type of foundation Open foundation		
9	Type of substructure RCC Wall type		
10	Type of superstructure RCC solid slab		
11	Existing Formation Level 92.049 m		
12	Final Formation Level 92.049 m		
13	Bed Level 86.462 m		
14	Distance of FCL from F.C.L. 0.35 m Left		
WIDENING AND REHABILITATION MEASURES SUGGESTED			
S. no.	Items	Rehabilitation Measures	Reference Drawings
1	Superstructure	Existing slab shall be dismantled and new slab shall be constructed	NSP STANDARD DRAWINGS FOR ROAD BRIDGES SD/64 (Deposited with shall be modified to 83 mm)
2	Sub-structure	Abutment & pier caps shall be dismantled and new caps shall be constructed, jacking shall be done in piers and abutments	OSRP/CE/RR/141
3	Crash barrier	Existing railings shall be dismantled and crash barrier shall be cast	OSRP/CE/BR/MSK-02
4	Expansion joint	Expansion joint buried due to overside of BT and shall be replaced by filler type	OSRP/CE/GBR/MISC-02
5	Wearing coat	Overside of BT shall be removed and W.C shall be replaced completely by 56 mm thick bituminous W.C.	OSRP/CE/GBR/MISC-02
6	Railing	2.0 mts. of railings to be replaced	NSP STANDARD DRAWING FOR CULVERTS NO. SD/115 (SIL 1 OF 4), SD/115 (SR 2 OF 4)
7	Vegetation growth	Vegetation to be removed from the structure and bed	-



WIDENING & REHABILITATION BRIDGE DETAILS	
BRIDGE AT CH. 15 - 680	
ORISSA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE	ES/MS/CE
DATE: 15.06.2011	DRAWING NO. ORSP/CE/BR/15-680/1
SCALE: 1:100	DATE: 15.06.2011
DESIGNED BY: [Signature]	CHECKED BY: [Signature]
DRAWN BY: [Signature]	DATE: 15.06.2011

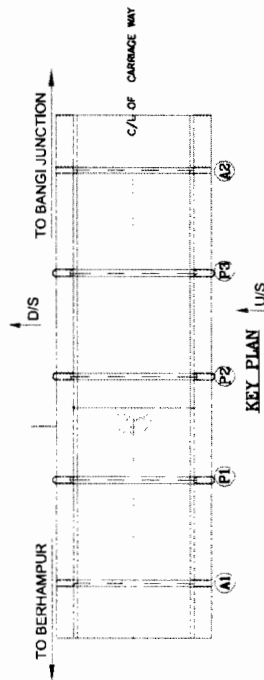
[Signature]
 M/S. [Signature] Construction
 CONTRACTORS
 Bhubaneswar

[Signature]
 Chief Engineer
 World Bank Projects, Odisha
 EMPLOYER
 Chief Engineer
 World Bank Project
 Under E.C.C. (Civil), Odisha
 Bhubaneswar.

NOTES:

EXISTING BRIDGE DETAILS	
1. Chainage	17+900
2. Name of the nullah	Sugar Nullah
3. Year of completion	1960
4. Type of bridge	High Level Bridge
5. Existing span arrangement	4 x 8.0 m
6. Existing carriage way width	7.5 m
7. Thickness of superstructure	0.8 m
8. Type of foundation	Open foundation
9. Type of substructure	RCC Wall type
10. Type of superstructure	RCC solid slab
11. Existing formation level	84.011 m
12. Final formation level	84.011 m
13. Road level	79.984 m
14. Chainage of RCC wall ECI	17+900
15. Chainage of RCC wall ECI	17+900
16. Chainage of RCC wall ECI	17+900

S. no.	Items	Rehabilitation Measures	Reference Drawings
1	Superstructure	Existing slab shall be dismantled and new slab shall be constructed	MSRP/CE/HR/MIS-42
2	Substructure	Abutment & pier caps shall be dismantled and new caps shall be constructed. Skewness shall be done in piers and abutments	MSRP/CE/HR/MIS-42
3	Crash barrier	Existing railings shall be dismantled and crash barrier shall be cast	MSRP/CE/HR/MIS-42
4	Superstructure	Existing slab shall be dismantled and new slab shall be constructed	MSRP/CE/HR/MIS-42
5	Expansion joint	Expansion joint buried due to overage of wearing coat and shall be replaced by filler type	MSRP/CE/HR/MIS-42
6	Crash barrier	Existing railings shall be dismantled and crash barrier shall be cast	MSRP/CE/HR/MIS-42
7	Approach slab	Approach slab to be constructed	MSRP/CE/HR/MIS-42
8	Wearing coat	Wearing coat shall be removed and W.C. shall be replaced completely by 75 mm thick bituminous W.C.	MSRP/CE/HR/MIS-42
9	Meaning	Ten paper bearings shall be provided	-
10	Vegetation growth	Vegetation to be removed from per capita and abutment	-



[Handwritten Signature]
 Mr. *[Name]* Construction
 RKPO Conservation Division
 Bhubaneswar

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 Chief Engineer
 World Bank Projects, Odisha
 EMPLOYER
 Chief Engineer
 World Bank Project
 Page 196 of 136
 O/o the Chief Engineer
 Bhubaneswar.

ORISSA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE

WIDENING & REHABILITATION BRIDGE DETAILS

BRIDGE AT CH. 17+900

DATE: 15.05.2017

DESIGNED BY: *[Name]*

CHECKED BY: *[Name]*

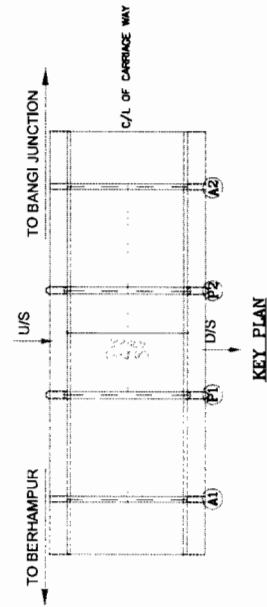
APPROVED BY: *[Name]*

SCALE: 1:100

NOTES:

EXISTING BRIDGE DETAILS	
1	Clearance 21.850
2	Name of the malik Kumber Nallah
3	Year of construction 1955
4	Type of bridge High Level Bridge
5	Existing span arrangement 7 X 10.8 m
6	Existing carriage way width 7.5 m
7	Thickness of superstructure 0.9 m
8	Type of foundation Open foundation
9	Type of abutment PCC Wall type
10	Type of superstructure RCC solid slab
11	Existing formation Level 83.332 m
12	Final Formation Level 82.337 m
13	Bed Level 78.869 m
14	Distance of PCL w.r.t LCL 0.13 m Left

WIDENING AND REHABILITATION MEASURES SUGGESTED			
S. no.	Items	Rehabilitation Measures	Reference Drawings
1	Superstructure	Existing slab shall be dismantled and new slab shall be constructed	MSP STANDARD SERVICES FOR ROAD BUILDERS, SLD 101 (Proposed deck slab width shall be modified to 8.3 m)
2	Substructure	Abutment & pier caps shall be dismantled and new caps shall be constructed; jacking shall be done in piers and abutments	OSRP/CEG/BR/JL-01
3	Crash barrier	Existing railing shall be dismantled and crash barrier shall be cast	OSRP/CEG/BR/NSC-02
4	Expansion joint	Expansion joint bearings due to overday of BT and shall be replaced by filler type	OSRP/CEG/BR/NSC-02
5	Vegetation growth	Vegetation to be removed from the structure and bed	



[Signature]
 M/s R.K. Construction
 CO-ORDINATOR

[Signature]
 Chief Engineer
 World Bank Projects, Odisha
 EMPLOYER
 Chief Engineer,
 World Bank Project
 O/o the C.E.G. (Civil), Odisha
 Bhubaneswar.

BRIDGE AT CH. - 21 - 850

CONSULTANCY SERVICES FOR FEASIBILITY STUDY AND DETAILED PROJECT PREPARATION OF PHASE - (I) ROADS FOR ORISSA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE

DATE: 11/04/2015

PROJECT NO.: ORSP/CEG/BR-17/01/1-850/01

REVISED DATE: 11/04/2015

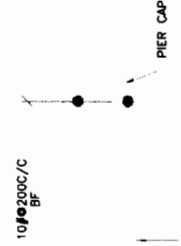
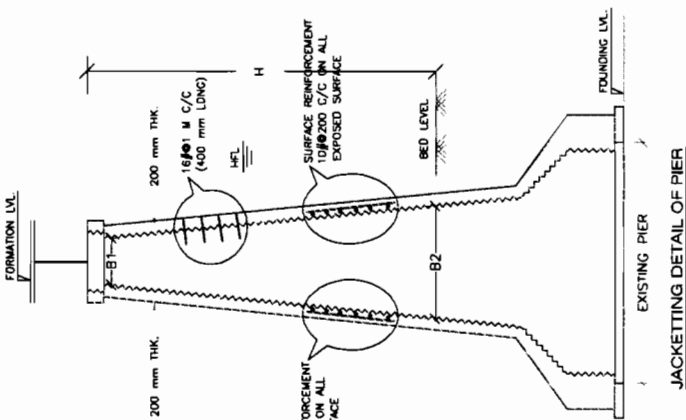
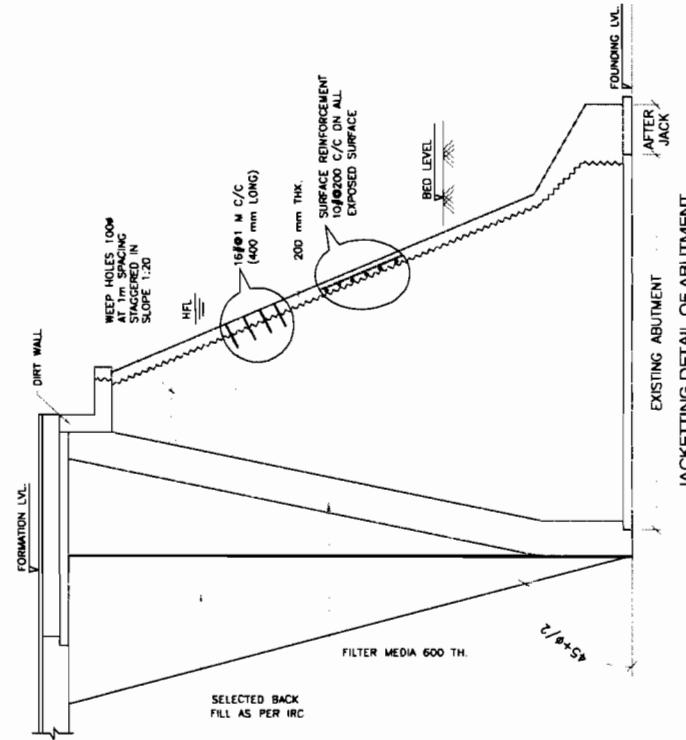
REVISED BY: [Signature]

REVISED DATE: 11/04/2015

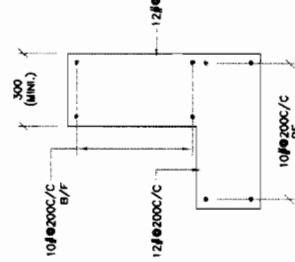
REVISED BY: [Signature]

NOTES :-

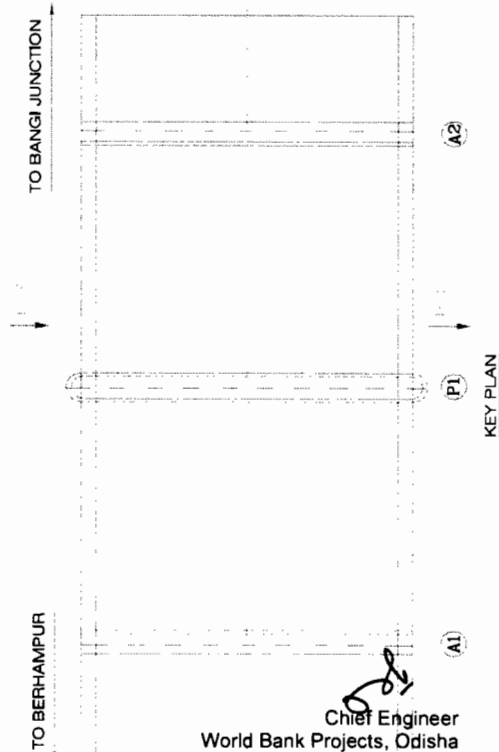
- 1 ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED. LEVELS ARE IN METRES.
- 2 DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- 3 AS PER CLAUSE 710.1.1 OF IRC 7B-2000, SURFACE REINFORCEMENT @ 2.5KG/SQM HAS TO BE PROVIDED ON ALL EXPOSED SURFACE HORIZONTALLY AND VERTICALLY.
- 4 GRADE OF CONCRETE :
PIER - M-15
ABUTMENT - M-15
ABUTMENT CAP - M-25
PIER CAP - M-25
APPROACH SLAB - M-30
SOLID SLAB - M-25
- 5 GRADE OF STEEL - Fe-415.



REINFORCEMENT DETAILS OF PIER CAP



REINFORCEMENT DETAILS OF DIRT WALL & ABUTMENT CAP



WIDENING OF EXISTING BRIDGES						
Sl. No	Location/Chaining	Span	Formation Level	Founding Level	Bed Level	
1	1/915	2 x 6.6	58.344	53.584	55.753	
2	4/400	3 x 6.75	72.63	66.70	69.12	
3	11/660	3 x 6.8	82.883	76.724	78.073	
4	15/185	2 x 6.8	90.352	84.864	86.653	
5	15/680	4 x 6.8	92.063	83.674	86.462	
6	17/900	4 x 6.8	84.091	77.674	79.981	
7	21/850	3 x 10.8	83.359	76.674	79.012	

[Signature]
M/s. RKD Construction
CONTRACTOR
Rhubaneswar

[Signature]
Chief Engineer
World Bank Projects, Odisha
EMPLOYER
Chief Engineer,
World Bank Project
O/o the Chief Engineer, Odisha
Bhubaneswar.

CONSULTANCY SERVICES FOR FEASIBILITY STUDY AND DETAILED PROJECT PREPARATION OF PHASE - (I) ROADS FOR ORISSA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE

ENGINEER: **CONSULTING ENGINEERS GROUP LTD**
 E-72, 1st Floor, Colaba, Mumbai - 400 006
 Tel: 2211-346, E-Mail: ceg@cegroup.com

FORM NO. - CDR/PC/CONTR/41
 DATE: 20/07/2017

JACKETING DETAIL OF ABUTMENT & PIER

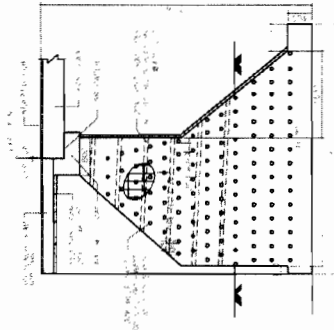
DESIGNED: _____
 CHECKED: _____
 APPROVED: _____

NOTES:

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
2. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE SPECIFICATIONS AND DRAWINGS.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS.
4. THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL ADJACENT PROPERTIES AND ROADS AT ALL TIMES.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES AND STRUCTURES.
6. THE CONTRACTOR SHALL MAINTAIN THE PROGRESS OF THE WORK AT ALL TIMES.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF ALL WORKERS AND THE PUBLIC.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF THE ENVIRONMENT.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL ADJACENT PROPERTIES AND ROADS.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES AND STRUCTURES.

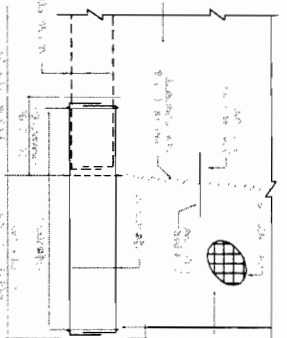
WIDENING METHODOLOGY:

- FOR ABUTMENT**
- 1. THE ABUTMENT SHALL BE WIDENED BY CONCRETE CASTING.
 - 2. THE EXISTING ABUTMENT SHALL BE PROTECTED BY SHIELDING.
 - 3. THE NEW ABUTMENT SHALL BE CASTED IN PLACE.
 - 4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL ADJACENT PROPERTIES AND ROADS.
 - 5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES AND STRUCTURES.
- FOR PIERS**
- 1. THE PIERS SHALL BE WIDENED BY CONCRETE CASTING.
 - 2. THE EXISTING PIERS SHALL BE PROTECTED BY SHIELDING.
 - 3. THE NEW PIERS SHALL BE CASTED IN PLACE.
 - 4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL ADJACENT PROPERTIES AND ROADS.
 - 5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES AND STRUCTURES.
- FOR ABUTMENT/PIER CAP:**
- 1. THE CAP SHALL BE WIDENED BY CONCRETE CASTING.
 - 2. THE EXISTING CAP SHALL BE PROTECTED BY SHIELDING.
 - 3. THE NEW CAP SHALL BE CASTED IN PLACE.
 - 4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL ADJACENT PROPERTIES AND ROADS.
 - 5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES AND STRUCTURES.
- FOR APPROACH SLAB:**
- 1. THE APPROACH SLAB SHALL BE WIDENED BY CONCRETE CASTING.
 - 2. THE EXISTING APPROACH SLAB SHALL BE PROTECTED BY SHIELDING.
 - 3. THE NEW APPROACH SLAB SHALL BE CASTED IN PLACE.
 - 4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL ADJACENT PROPERTIES AND ROADS.
 - 5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES AND STRUCTURES.

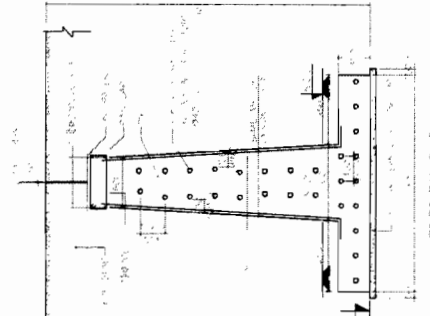


REINFORCEMENT DETAILS OF DIRT WALL & ABUTMENT CAP

SECTION D-D



SECTION E-E



SECTION F-F

WIDENING OF EXISTING BRIDGES						
Sl. No	Location/Chainage	Span	Formation Level	Founding Level	Bed Level	
1	4/400	3 x 6.75	72.63	66.70	69.12	
2	11/660	3 x 6.8	82.883	76.724	78.073	
3	15/185	2 x 6.8	90.352	84.864	86.653	
4	15/680	4 X 6.8	92.063	83.674	86.462	
5	17/900	4 x 6.8	84.091	77.674	79.981	
6	21/850	3 x 10.8	83.359	76.674	79.012	

M/s. ABC Construction
CONTRACTOR



World Bank Projects, Odisha
EMPLOYER

Chief Engineer,
World Bank Project
O/o the E.I.C.(Civil), Odisha
Bhubaneswar

CONSULTING
ENGINEERS GROUP LTD.
E-12(A) Colony, Bhubaneswar, Odisha
Ph. 251-344, E-mail: egroup@rediffmail.com

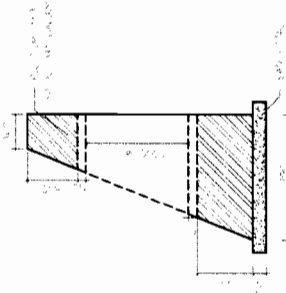
PROJECT: CONSULTANCY SERVICES FOR FEASIBILITY STUDY AND DETAILED PROJECT PREPARATION OF PHASE - (I) ROADS FOR ORISSA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE

DETAILS FOR WIDENING
METHODOLOGY OF MINOR BRIDGES

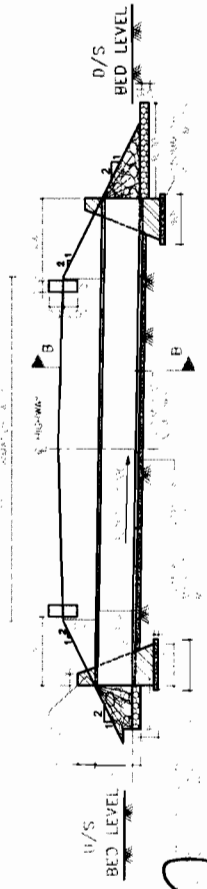
DATE: 15.11.2017	SCALE:	DATE:	SCALE:
DESIGNED BY:	CHECKED BY:	DESIGNED BY:	CHECKED BY:

NOTES:

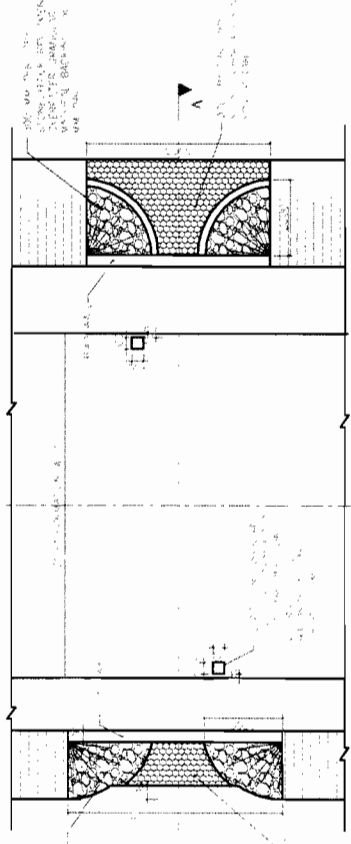
1. The structure is to be constructed in accordance with the provisions of the Indian Standards IS: 456-1978 and IS: 800-1984.
2. The structure is to be constructed in accordance with the provisions of the Indian Standards IS: 456-1978 and IS: 800-1984.
3. The structure is to be constructed in accordance with the provisions of the Indian Standards IS: 456-1978 and IS: 800-1984.
4. The structure is to be constructed in accordance with the provisions of the Indian Standards IS: 456-1978 and IS: 800-1984.
5. The structure is to be constructed in accordance with the provisions of the Indian Standards IS: 456-1978 and IS: 800-1984.
6. The structure is to be constructed in accordance with the provisions of the Indian Standards IS: 456-1978 and IS: 800-1984.
7. The structure is to be constructed in accordance with the provisions of the Indian Standards IS: 456-1978 and IS: 800-1984.
8. The structure is to be constructed in accordance with the provisions of the Indian Standards IS: 456-1978 and IS: 800-1984.
9. The structure is to be constructed in accordance with the provisions of the Indian Standards IS: 456-1978 and IS: 800-1984.
10. The structure is to be constructed in accordance with the provisions of the Indian Standards IS: 456-1978 and IS: 800-1984.



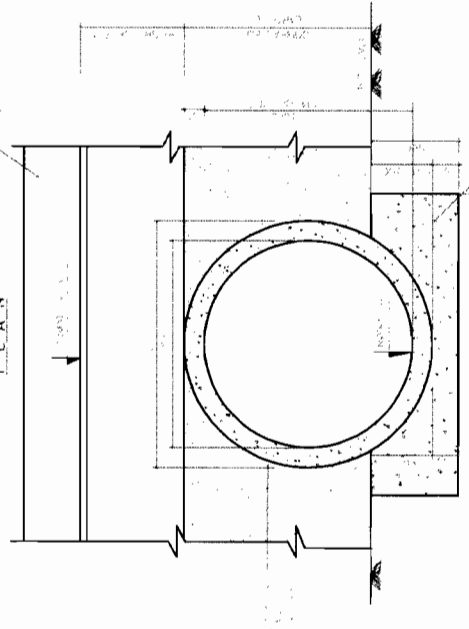
DETAIL OF HEAD WALL



SECTION A-A



PLAN



SECTION B B

MAIN DIMENSIONS

S.No	Proposed Chaining Level	Existing Proposed Invert Level	Camber/Slope		Bed level		Height of B	
			Left	Right	Left	Right	Left	Right
1	15.72	15.72	-2.5%	-2.5%	15.72	15.72	1.00	1.00
2	15.65	15.65	-2.5%	-2.5%	15.65	15.65	1.00	1.00
3	15.58	15.58	-2.5%	-2.5%	15.58	15.58	1.00	1.00
4	15.51	15.51	-2.5%	-2.5%	15.51	15.51	1.00	1.00
5	15.44	15.44	-2.5%	-2.5%	15.44	15.44	1.00	1.00
6	15.37	15.37	-2.5%	-2.5%	15.37	15.37	1.00	1.00
7	15.30	15.30	-2.5%	-2.5%	15.30	15.30	1.00	1.00
8	15.23	15.23	-2.5%	-2.5%	15.23	15.23	1.00	1.00
9	15.16	15.16	-2.5%	-2.5%	15.16	15.16	1.00	1.00
10	15.09	15.09	-2.5%	-2.5%	15.09	15.09	1.00	1.00
11	15.02	15.02	-2.5%	-2.5%	15.02	15.02	1.00	1.00
12	14.95	14.95	-2.5%	-2.5%	14.95	14.95	1.00	1.00
13	14.88	14.88	-2.5%	-2.5%	14.88	14.88	1.00	1.00
14	14.81	14.81	-2.5%	-2.5%	14.81	14.81	1.00	1.00
15	14.74	14.74	-2.5%	-2.5%	14.74	14.74	1.00	1.00
16	14.67	14.67	-2.5%	-2.5%	14.67	14.67	1.00	1.00
17	14.60	14.60	-2.5%	-2.5%	14.60	14.60	1.00	1.00
18	14.53	14.53	-2.5%	-2.5%	14.53	14.53	1.00	1.00
19	14.46	14.46	-2.5%	-2.5%	14.46	14.46	1.00	1.00
20	14.39	14.39	-2.5%	-2.5%	14.39	14.39	1.00	1.00
21	14.32	14.32	-2.5%	-2.5%	14.32	14.32	1.00	1.00
22	14.25	14.25	-2.5%	-2.5%	14.25	14.25	1.00	1.00
23	14.18	14.18	-2.5%	-2.5%	14.18	14.18	1.00	1.00
24	14.11	14.11	-2.5%	-2.5%	14.11	14.11	1.00	1.00
25	14.04	14.04	-2.5%	-2.5%	14.04	14.04	1.00	1.00
26	13.97	13.97	-2.5%	-2.5%	13.97	13.97	1.00	1.00
27	13.90	13.90	-2.5%	-2.5%	13.90	13.90	1.00	1.00
28	13.83	13.83	-2.5%	-2.5%	13.83	13.83	1.00	1.00
29	13.76	13.76	-2.5%	-2.5%	13.76	13.76	1.00	1.00
30	13.69	13.69	-2.5%	-2.5%	13.69	13.69	1.00	1.00
31	13.62	13.62	-2.5%	-2.5%	13.62	13.62	1.00	1.00
32	13.55	13.55	-2.5%	-2.5%	13.55	13.55	1.00	1.00
33	13.48	13.48	-2.5%	-2.5%	13.48	13.48	1.00	1.00
34	13.41	13.41	-2.5%	-2.5%	13.41	13.41	1.00	1.00
35	13.34	13.34	-2.5%	-2.5%	13.34	13.34	1.00	1.00
36	13.27	13.27	-2.5%	-2.5%	13.27	13.27	1.00	1.00
37	13.20	13.20	-2.5%	-2.5%	13.20	13.20	1.00	1.00
38	13.13	13.13	-2.5%	-2.5%	13.13	13.13	1.00	1.00
39	13.06	13.06	-2.5%	-2.5%	13.06	13.06	1.00	1.00
40	12.99	12.99	-2.5%	-2.5%	12.99	12.99	1.00	1.00
41	12.92	12.92	-2.5%	-2.5%	12.92	12.92	1.00	1.00
42	12.85	12.85	-2.5%	-2.5%	12.85	12.85	1.00	1.00
43	12.78	12.78	-2.5%	-2.5%	12.78	12.78	1.00	1.00
44	12.71	12.71	-2.5%	-2.5%	12.71	12.71	1.00	1.00
45	12.64	12.64	-2.5%	-2.5%	12.64	12.64	1.00	1.00
46	12.57	12.57	-2.5%	-2.5%	12.57	12.57	1.00	1.00
47	12.50	12.50	-2.5%	-2.5%	12.50	12.50	1.00	1.00
48	12.43	12.43	-2.5%	-2.5%	12.43	12.43	1.00	1.00
49	12.36	12.36	-2.5%	-2.5%	12.36	12.36	1.00	1.00
50	12.29	12.29	-2.5%	-2.5%	12.29	12.29	1.00	1.00
51	12.22	12.22	-2.5%	-2.5%	12.22	12.22	1.00	1.00
52	12.15	12.15	-2.5%	-2.5%	12.15	12.15	1.00	1.00
53	12.08	12.08	-2.5%	-2.5%	12.08	12.08	1.00	1.00
54	12.01	12.01	-2.5%	-2.5%	12.01	12.01	1.00	1.00
55	11.94	11.94	-2.5%	-2.5%	11.94	11.94	1.00	1.00
56	11.87	11.87	-2.5%	-2.5%	11.87	11.87	1.00	1.00
57	11.80	11.80	-2.5%	-2.5%	11.80	11.80	1.00	1.00
58	11.73	11.73	-2.5%	-2.5%	11.73	11.73	1.00	1.00
59	11.66	11.66	-2.5%	-2.5%	11.66	11.66	1.00	1.00
60	11.59	11.59	-2.5%	-2.5%	11.59	11.59	1.00	1.00
61	11.52	11.52	-2.5%	-2.5%	11.52	11.52	1.00	1.00
62	11.45	11.45	-2.5%	-2.5%	11.45	11.45	1.00	1.00
63	11.38	11.38	-2.5%	-2.5%	11.38	11.38	1.00	1.00
64	11.31	11.31	-2.5%	-2.5%	11.31	11.31	1.00	1.00
65	11.24	11.24	-2.5%	-2.5%	11.24	11.24	1.00	1.00
66	11.17	11.17	-2.5%	-2.5%	11.17	11.17	1.00	1.00
67	11.10	11.10	-2.5%	-2.5%	11.10	11.10	1.00	1.00
68	11.03	11.03	-2.5%	-2.5%	11.03	11.03	1.00	1.00
69	10.96	10.96	-2.5%	-2.5%	10.96	10.96	1.00	1.00
70	10.89	10.89	-2.5%	-2.5%	10.89	10.89	1.00	1.00
71	10.82	10.82	-2.5%	-2.5%	10.82	10.82	1.00	1.00
72	10.75	10.75	-2.5%	-2.5%	10.75	10.75	1.00	1.00
73	10.68	10.68	-2.5%	-2.5%	10.68	10.68	1.00	1.00
74	10.61	10.61	-2.5%	-2.5%	10.61	10.61	1.00	1.00
75	10.54	10.54	-2.5%	-2.5%	10.54	10.54	1.00	1.00
76	10.47	10.47	-2.5%	-2.5%	10.47	10.47	1.00	1.00
77	10.40	10.40	-2.5%	-2.5%	10.40	10.40	1.00	1.00
78	10.33	10.33	-2.5%	-2.5%	10.33	10.33	1.00	1.00
79	10.26	10.26	-2.5%	-2.5%	10.26	10.26	1.00	1.00
80	10.19	10.19	-2.5%	-2.5%	10.19	10.19	1.00	1.00
81	10.12	10.12	-2.5%	-2.5%	10.12	10.12	1.00	1.00
82	10.05	10.05	-2.5%	-2.5%	10.05	10.05	1.00	1.00
83	9.98	9.98	-2.5%	-2.5%	9.98	9.98	1.00	1.00
84	9.91	9.91	-2.5%	-2.5%	9.91	9.91	1.00	1.00
85	9.84	9.84	-2.5%	-2.5%	9.84	9.84	1.00	1.00
86	9.77	9.77	-2.5%	-2.5%	9.77	9.77	1.00	1.00
87	9.70	9.70	-2.5%	-2.5%	9.70	9.70	1.00	1.00
88	9.63	9.63	-2.5%	-2.5%	9.63	9.63	1.00	1.00
89	9.56	9.56	-2.5%	-2.5%	9.56	9.56	1.00	1.00
90	9.49	9.49	-2.5%	-2.5%	9.49	9.49	1.00	1.00
91	9.42	9.42	-2.5%	-2.5%	9.42	9.42	1.00	1.00
92	9.35	9.35	-2.5%	-2.5%	9.35	9.35	1.00	1.00
93	9.28	9.28	-2.5%	-2.5%	9.28	9.28	1.00	1.00
94	9.21	9.21	-2.5%	-2.5%	9.21	9.21	1.00	1.00
95	9.14	9.14	-2.5%	-2.5%	9.14	9.14	1.00	1.00
96	9.07	9.07	-2.5%	-2.5%	9.07	9.07	1.00	1.00
97	9.00	9.00	-2.5%	-2.5%	9.00	9.00	1.00	1.00
98	8.93	8.93	-2.5%	-2.5%	8.93	8.93	1.00	1.00
99	8.86	8.86	-2.5%	-2.5%	8.86	8.86	1.00	1.00
100	8.79	8.79	-2.5%	-2.5%	8.79	8.79	1.00	1.00

Signature
 M/s RKD Construction
 CONSULTANTS
 Bhubaneswar

Signature
 Chief Engineer
 World Bank Projects, Odisha Project
 EMPLOYMENT (Civil), Odisha
 Bhubaneswar.
 Page 129 of 135

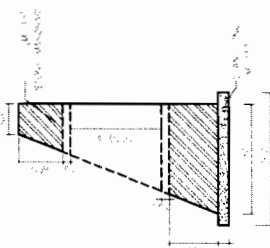
Project: Orissa State Road Project
 Under World Bank Assistance

TYPICAL ARRANGEMENT
 FOR R.C.C SINGLE PIPE CULVERTS (1.0m DIA)
 (HEIGHT OF FILL VARYING FROM 0.6 TO 4.0 M)

Drawing No.: WB/2024/17/Ann. CL-41
 Date: 28.07.2024
 Rev. No.: 01
 Prepared by: [Name]
 Checked by: [Name]
 Scale: As Shown

NOTES:

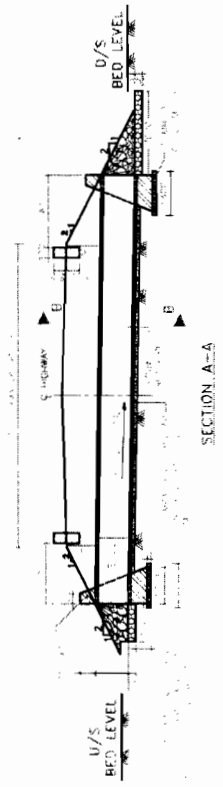
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
2. THE PROPOSED ROAD CROSS SECTION IS AS SHOWN IN THE ATTACHED DRAWING.
3. THE PROPOSED ROAD GRADE IS AS SHOWN IN THE ATTACHED DRAWING.
4. THE PROPOSED ROAD WIDTH IS 12.0 METERS.
5. THE PROPOSED ROAD LENGTH IS 1.0 KILOMETER.
6. THE PROPOSED ROAD IS TO BE CONSTRUCTED IN ACCORDANCE WITH THE DESIGN SPECIFICATIONS.
7. THE PROPOSED ROAD IS TO BE CONSTRUCTED IN ACCORDANCE WITH THE DESIGN SPECIFICATIONS.
8. THE PROPOSED ROAD IS TO BE CONSTRUCTED IN ACCORDANCE WITH THE DESIGN SPECIFICATIONS.
9. THE PROPOSED ROAD IS TO BE CONSTRUCTED IN ACCORDANCE WITH THE DESIGN SPECIFICATIONS.
10. THE PROPOSED ROAD IS TO BE CONSTRUCTED IN ACCORDANCE WITH THE DESIGN SPECIFICATIONS.



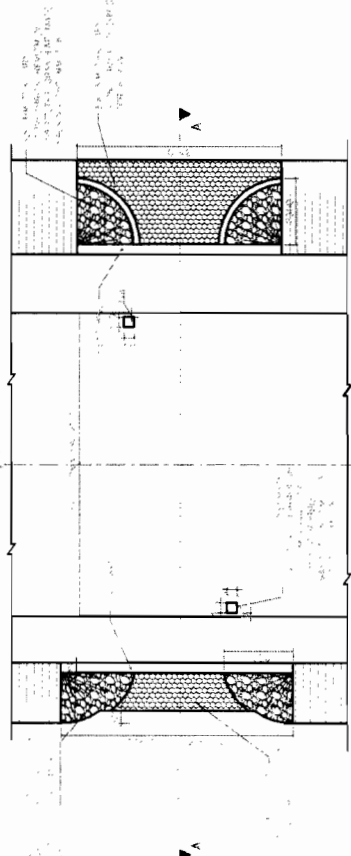
DETAIL OF HEAD WALL

DOUBLE PIPE CULVERTS DETAILS

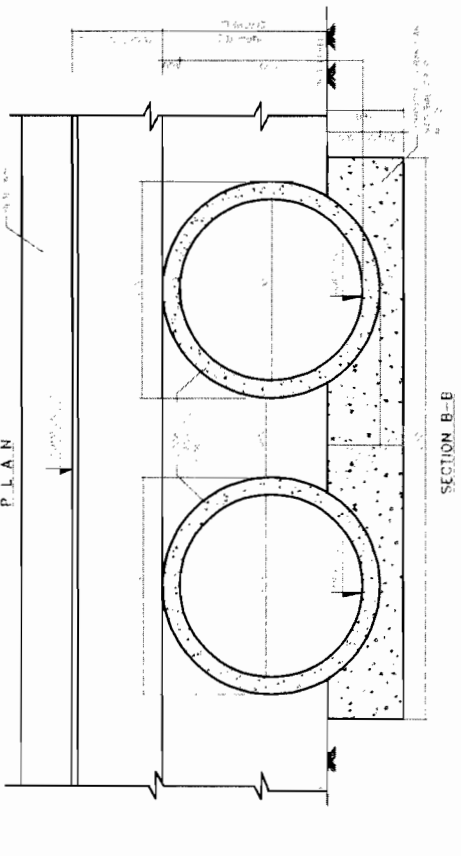
Sl. No	Proposed Formation Level	Camber/Super Elevation		Bed level		Height of Fill (Ht)	
		Left	Right	Left	Right	Left	Right
1	213	55.528	-2.5%	55.907	54.100	1.821	1.428
2	389	54.990	2.5%	55.311	53.511	1.800	1.479
3	847	56.410	-2.5%	54.239	54.888	2.081	1.724
4	975	56.821	5.1%	55.402	56.830	1.419	0.991
5	1146	57.166	5.10%	55.126	56.221	2.040	1.945
6	1310	57.490	-2.5%	55.725	55.450	1.745	2.030
7	1781	58.343	-6.16%	56.278	56.404	2.065	1.839
8	2332	60.172	-2.5%	58.123	58.217	2.049	1.855
9	2515	60.276	5.6%	57.294	57.301	2.982	2.976
10	2629	60.295	5.6%	57.851	56.044	2.404	2.211
11	3498	64.325	-2.5%	62.27	62.59	2.060	1.745
12	3765	65.900	-2.5%	64.26	64.23	1.689	1.725
13	3890	66.772	-2.5%	65.068	65.107	1.704	1.665
14	4115	68.377	-2.5%	67.715	67.489	1.662	1.889
15	9069	80.633	-2.5%	76.338	76.290	2.285	2.343
16	9769	82.970	-2.5%	80.078	80.288	2.692	2.392
17	8169	86.480	-2.5%	83.907	84.264	2.483	2.116
18	8885	86.480	-2.5%	83.907	84.264	2.483	2.116
19	9638	86.948	-6.8%	83.239	83.689	3.710	3.260
20	11120	83.326	-2.5%	81.946	81.118	1.360	2.208
21	11500	82.812	-2.5%	80.723	80.954	2.089	1.858
22	12065	84.908	-2.5%	82.953	82.872	1.955	2.038
23	12907	86.809	-2.5%	84.205	84.076	1.604	1.733
24	13809	88.118	-2.5%	86.631	86.782	2.487	2.356
25	14877	91.987	-2.5%	88.347	88.979	2.320	2.688
26	19182	93.486	-2.5%	91.837	91.697	1.649	1.788
27	21865	83.095	-2.5%	80.746	80.731	0.465	0.87
28	22582	86.648	2.5%	84.683	84.616	1.965	2.032
29	28314	115.371	-3.00%	113.124	113.148	2.247	2.225
30	33402	110.188	3.50%	107.704	108.248	2.464	1.928
31	38746	145.573	-2.5%	142.294	142.395	2.339	2.178
32	39802	145.461	-2.5%	143.28	143.56	2.182	1.902
33	39119	145.317	-2.5%	143.279	143.309	3.009	3.009
34	40280	156.028	-3.30%	152.910	153.124	3.116	2.903
35	46880	145.461	-2.5%	143.28	143.56	2.182	1.902
36	41090	165.551	0.64%	163.854	163.925	4.719	4.542
01	16417	90.827	-2.5%	86.215	86.418	4.719	4.522



SECTION A-A



PLAN



SECTION B-B

TYPICAL ARRANGEMENT

FOR R.C.C DOUBLE PIPE CULVERTS (1.0m DIA)
(HEIGHT OF FILL VARYING FROM 0.8 TO 4.0 M)

Shubaneswar
 M/s. Shubaneswar Construction
 Shubaneswar

Shubaneswar
 Chief Engineer
 World Bank Projects, Odisha
 EMPLOYER
 World Bank Project
 O/o the E.I.C.(Civil), Odisha
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NOTES:

1. The bridge shall be constructed in accordance with the specifications of the Indian Road Congress (IRC) and the Bureau of Indian Standards (BIS).

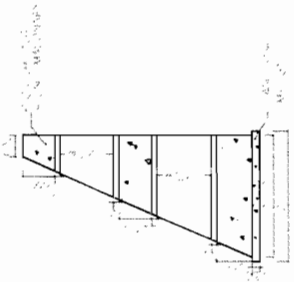
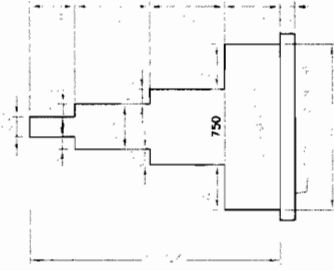
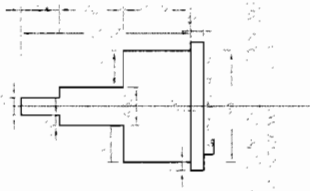
2. The bridge shall be constructed on a firm foundation and shall be able to withstand the maximum design load.

3. The bridge shall be constructed in such a manner as to ensure the safety and durability of the structure.

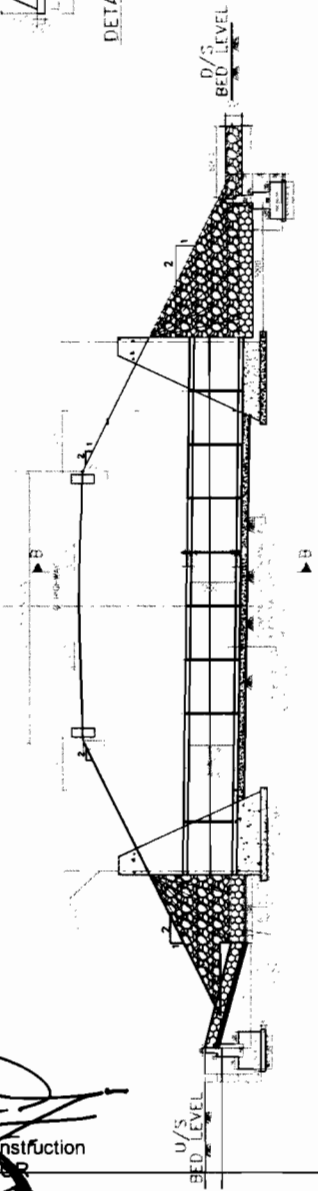
4. The bridge shall be constructed in accordance with the approved design and shall be subject to the supervision of the Engineer-in-Charge.

5. The bridge shall be constructed in accordance with the approved design and shall be subject to the supervision of the Engineer-in-Charge.

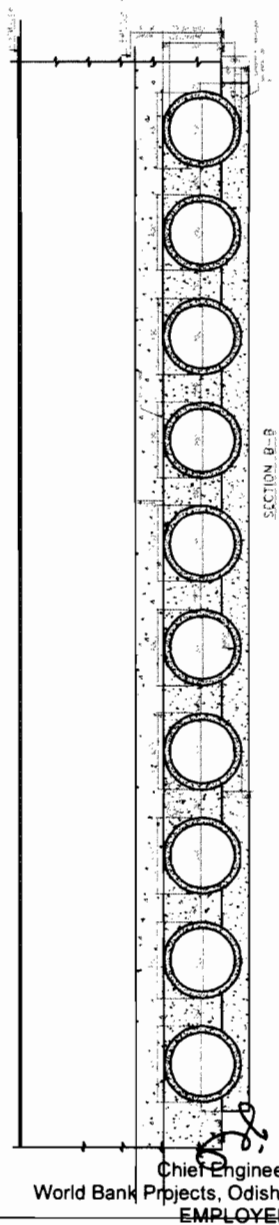
REFERENCE DRAWINGS:



DETAIL OF HEAD WALL



S. no.	Proposed Chainage	Formation Level	Bed Level	Superelevation/ Camber		Height of fill		Total length	No of pipes
				Left	Right	H1	H2		
1	29+560	98.950	93.803	-2.5	-2.5	3.947	3.947	14.7	132



Devi
 M.S. Construction
 Bhubaneswar

Chief Engineer,
 World Bank Project,
 O/o the E.I.C. (Civil), Odisha
 Bhubaneswar.

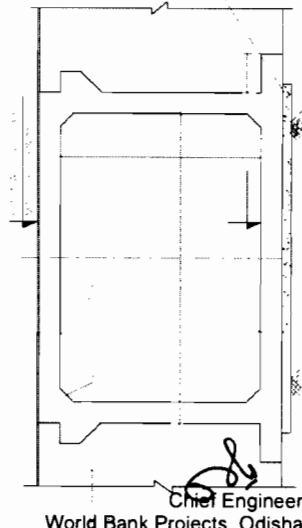
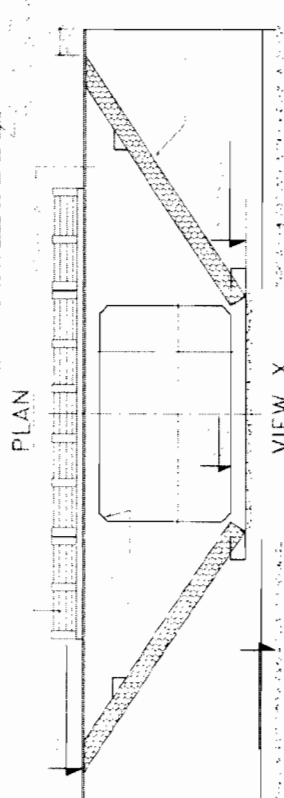
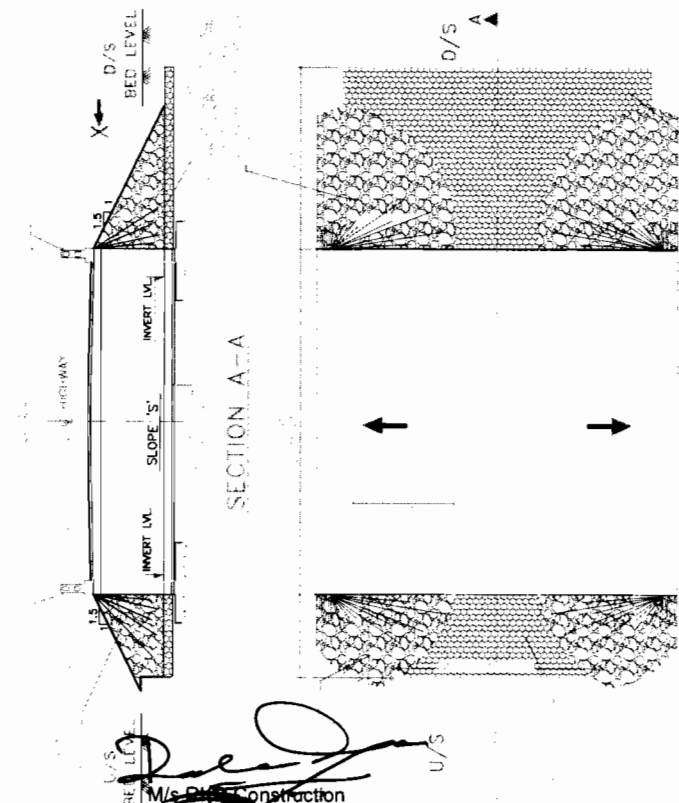
ORISSA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE

GENERAL ARRANGEMENT DRAWING
 BRIDGE AT PROPOSED CH. 29+560

PROJECT NO. ORISSA/2002/11-17/01/01-01/01
 DRAWING NO. BRIDGE/01/01/01/01/01/01
 DATE: 11/11/01
 SCALE: 1:1000
 DRAWN BY: [Name]
 CHECKED BY: [Name]
 APPROVED BY: [Name]
 TITLE: OC. Road Bank Project

NOTES:

REFERENCE DRAWING:-



DIMENSION DETAILS OF BOX

M/s. P... Construction
 R...
 R...
 R...

Type	Span	Clearance	Span, TRL	Comer	Bed Level	Span	Total Ht.	Ch. Ht.	Exc.	Typ.	Thk.	Thk.
1	1.20	5.00	1.20	1.00	1.00	1.20	2.40	1.20	1.20	1.20	1.20	1.20
2	1.50	5.00	1.50	1.00	1.00	1.50	3.00	1.50	1.50	1.50	1.50	1.50
3	2.00	5.00	2.00	1.00	1.00	2.00	4.00	2.00	2.00	2.00	2.00	2.00
4	2.50	5.00	2.50	1.00	1.00	2.50	5.00	2.50	2.50	2.50	2.50	2.50
5	3.00	5.00	3.00	1.00	1.00	3.00	6.00	3.00	3.00	3.00	3.00	3.00
6	3.50	5.00	3.50	1.00	1.00	3.50	7.00	3.50	3.50	3.50	3.50	3.50
7	4.00	5.00	4.00	1.00	1.00	4.00	8.00	4.00	4.00	4.00	4.00	4.00
8	4.50	5.00	4.50	1.00	1.00	4.50	9.00	4.50	4.50	4.50	4.50	4.50
9	5.00	5.00	5.00	1.00	1.00	5.00	10.00	5.00	5.00	5.00	5.00	5.00
10	5.50	5.00	5.50	1.00	1.00	5.50	11.00	5.50	5.50	5.50	5.50	5.50
11	6.00	5.00	6.00	1.00	1.00	6.00	12.00	6.00	6.00	6.00	6.00	6.00
12	6.50	5.00	6.50	1.00	1.00	6.50	13.00	6.50	6.50	6.50	6.50	6.50
13	7.00	5.00	7.00	1.00	1.00	7.00	14.00	7.00	7.00	7.00	7.00	7.00
14	7.50	5.00	7.50	1.00	1.00	7.50	15.00	7.50	7.50	7.50	7.50	7.50
15	8.00	5.00	8.00	1.00	1.00	8.00	16.00	8.00	8.00	8.00	8.00	8.00
16	8.50	5.00	8.50	1.00	1.00	8.50	17.00	8.50	8.50	8.50	8.50	8.50
17	9.00	5.00	9.00	1.00	1.00	9.00	18.00	9.00	9.00	9.00	9.00	9.00
18	9.50	5.00	9.50	1.00	1.00	9.50	19.00	9.50	9.50	9.50	9.50	9.50
19	10.00	5.00	10.00	1.00	1.00	10.00	20.00	10.00	10.00	10.00	10.00	10.00
20	10.50	5.00	10.50	1.00	1.00	10.50	21.00	10.50	10.50	10.50	10.50	10.50
21	11.00	5.00	11.00	1.00	1.00	11.00	22.00	11.00	11.00	11.00	11.00	11.00
22	11.50	5.00	11.50	1.00	1.00	11.50	23.00	11.50	11.50	11.50	11.50	11.50
23	12.00	5.00	12.00	1.00	1.00	12.00	24.00	12.00	12.00	12.00	12.00	12.00
24	12.50	5.00	12.50	1.00	1.00	12.50	25.00	12.50	12.50	12.50	12.50	12.50
25	13.00	5.00	13.00	1.00	1.00	13.00	26.00	13.00	13.00	13.00	13.00	13.00
26	13.50	5.00	13.50	1.00	1.00	13.50	27.00	13.50	13.50	13.50	13.50	13.50
27	14.00	5.00	14.00	1.00	1.00	14.00	28.00	14.00	14.00	14.00	14.00	14.00
28	14.50	5.00	14.50	1.00	1.00	14.50	29.00	14.50	14.50	14.50	14.50	14.50

TABLE SHOWING SALIENT DIMENSIONS

BOX/TYPE	WIDTH (mm)	HEIGHT (mm)	THICKNESS (mm)	THICKNESS (mm)	THICKNESS (mm)	NET CAPACITY (T/M)
1	1500	1500	150	150	150	1.0
2	2000	2000	200	200	200	1.5
3	2500	2500	250	250	250	2.0
4	3000	3000	300	300	300	2.5
5	3500	3500	350	350	350	3.0
6	4000	4000	400	400	400	3.5
7	4500	4500	450	450	450	4.0
8	5000	5000	500	500	500	4.5
9	5500	5500	550	550	550	5.0
10	6000	6000	600	600	600	5.5
11	6500	6500	650	650	650	6.0
12	7000	7000	700	700	700	6.5
13	7500	7500	750	750	750	7.0
14	8000	8000	800	800	800	7.5
15	8500	8500	850	850	850	8.0
16	9000	9000	900	900	900	8.5
17	9500	9500	950	950	950	9.0
18	10000	10000	1000	1000	1000	9.5
19	10500	10500	1050	1050	1050	10.0
20	11000	11000	1100	1100	1100	10.5
21	11500	11500	1150	1150	1150	11.0
22	12000	12000	1200	1200	1200	11.5
23	12500	12500	1250	1250	1250	12.0
24	13000	13000	1300	1300	1300	12.5
25	13500	13500	1350	1350	1350	13.0
26	14000	14000	1400	1400	1400	13.5
27	14500	14500	1450	1450	1450	14.0
28	15000	15000	1500	1500	1500	14.5

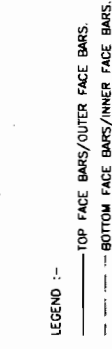
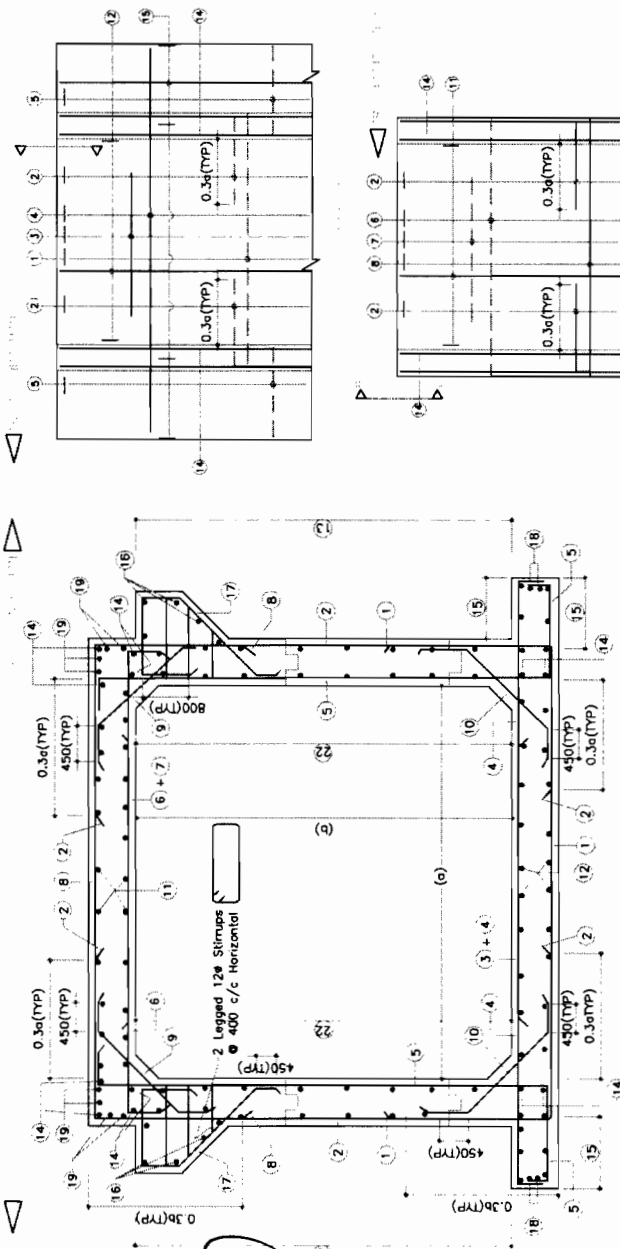
ORISSA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE

GENERAL ARRANGEMENT DRAWING
 SINGLE CELL R.C.C. BOX CULVERT

DESIGNED BY: CHANDAN K. SAH (17/04/2017)
 DATE: 17/04/2017
 CHECKED BY: ...
 APPROVED BY: ...
 SCALE: ...

- NOTES :-**
- 1 ALL DIMENSIONS ARE IN MM & LEVELS ARE IN METER.
 - 2 THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DRAWING/CE/201-16/ BOX CUL-01
 - 3 MINIMUM CLEAR COVER TO MAIN REINFORCEMENT SHALL BE 40mm
 - 4 MINIMUM LAP LENGTH OF REINFORCEMENT SHALL BE KEPT AS 43 D WHERE D IS THE DIAMETER THE BAR. NOT MORE THAN 50% SHALL BE LAPPED AT ANY ONE LOCATION.
 - 5 LINK SHOULD GO ROUND MAIN BAR AND CONTINUE ALONG BARREL.
 - 6 LINK SHALL BE STARTED AT DISTANCE OF HALF THEIR SPACING FROM THE FACE OF SUPPORT.
 - 7 MAXIMUM SIZE OF AGGREGATE TO BE USED IN RCC IS 20mm
 - 8 GRADE OF CONCRETE M-20.
 - 9 ALL REINFORCEMENT BARS SHALL BE HIGH YIELD STRENGTH DEFORMED BARS OF GRADE F_{yk} 415 CONFORMING TO IS:1786-1985 WITH A MINIMUM YIELD STRENGTH OF 415 N/mm².
 - 10 JOINT OR LAPPING OF BARS SHALL BE SUITABLY STAGGERED AS PER CLAUSE 304.6 OF IRC:21-2000.

REFERENCE DRAWING :-



BAR MARK	SHAPE	1/22/0	1/23/0	1/33/0	1/43/0	1/53/0	1/63/0	1/64/0	
BAR DIA	SPACING	BAR DIA	SPACING	BAR DIA	SPACING	BAR DIA	SPACING	BAR DIA	SPACING
1	16	250	16	225	10	200	12	200	16
2	16	250	16	225	10	200	12	200	16
3	16	250	16	225	10	200	12	200	16
4	16	250	16	225	10	200	12	200	16
5	16	250	16	225	10	200	12	200	16
6	16	250	16	225	10	200	12	200	16
7	16	250	16	225	10	200	12	200	16
8	16	250	16	225	10	200	12	200	16
9	16	250	16	225	10	200	12	200	16
10	16	250	16	225	10	200	12	200	16
11	16	250	16	225	10	200	12	200	16
12	16	250	16	225	10	200	12	200	16
13	16	250	16	225	10	200	12	200	16
14	16	250	16	225	10	200	12	200	16
15	16	250	16	225	10	200	12	200	16
16	16	250	16	225	10	200	12	200	16
17	16	250	16	225	10	200	12	200	16
18	16	250	16	225	10	200	12	200	16
19	16	250	16	225	10	200	12	200	16
20	16	250	16	225	10	200	12	200	16
21	16	250	16	225	10	200	12	200	16
22	16	250	16	225	10	200	12	200	16
23	16	250	16	225	10	200	12	200	16
24	16	250	16	225	10	200	12	200	16
25	16	250	16	225	10	200	12	200	16
26	16	250	16	225	10	200	12	200	16
27	16	250	16	225	10	200	12	200	16
28	16	250	16	225	10	200	12	200	16
29	16	250	16	225	10	200	12	200	16
30	16	250	16	225	10	200	12	200	16
31	16	250	16	225	10	200	12	200	16
32	16	250	16	225	10	200	12	200	16
33	16	250	16	225	10	200	12	200	16
34	16	250	16	225	10	200	12	200	16
35	16	250	16	225	10	200	12	200	16
36	16	250	16	225	10	200	12	200	16
37	16	250	16	225	10	200	12	200	16
38	16	250	16	225	10	200	12	200	16
39	16	250	16	225	10	200	12	200	16
40	16	250	16	225	10	200	12	200	16
41	16	250	16	225	10	200	12	200	16
42	16	250	16	225	10	200	12	200	16
43	16	250	16	225	10	200	12	200	16
44	16	250	16	225	10	200	12	200	16
45	16	250	16	225	10	200	12	200	16
46	16	250	16	225	10	200	12	200	16
47	16	250	16	225	10	200	12	200	16
48	16	250	16	225	10	200	12	200	16
49	16	250	16	225	10	200	12	200	16
50	16	250	16	225	10	200	12	200	16
51	16	250	16	225	10	200	12	200	16
52	16	250	16	225	10	200	12	200	16
53	16	250	16	225	10	200	12	200	16
54	16	250	16	225	10	200	12	200	16
55	16	250	16	225	10	200	12	200	16
56	16	250	16	225	10	200	12	200	16
57	16	250	16	225	10	200	12	200	16
58	16	250	16	225	10	200	12	200	16
59	16	250	16	225	10	200	12	200	16
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65	16	250	16	225	10	200	12	200	16
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67	16	250	16	225	10	200	12	200	16
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69	16	250	16	225	10	200	12	200	16
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72	16	250	16	225	10	200	12	200	16
73	16	250	16	225	10	200	12	200	16
74	16	250	16	225	10	200	12	200	16
75	16	250	16	225	10	200	12	200	16
76	16	250	16	225	10	200	12	200	16
77	16	250	16	225	10	200	12	200	16
78	16	250	16	225	10	200	12	200	16
79	16	250	16	225	10	200	12	200	16
80	16	250	16	225	10	200	12	200	16
81	16	250	16	225	10	200	12	200	16
82	16	250	16	225	10	200	12	200	16
83	16	250	16	225	10	200	12	200	16
84	16	250	16	225	10	200	12	200	16
85	16	250	16	225	10	200	12	200	16
86	16	250	16	225	10	200	12	200	16
87	16	250	16	225	10	200	12	200	16
88	16	250	16	225	10	200	12	200	16
89	16	250	16	225	10	200	12	200	16
90	16	250	16	225	10	200	12	200	16
91	16	250	16	225	10	200	12	200	16
92	16	250	16	225	10	200	12	200	16
93	16	250	16	225	10	200	12	200	16
94	16	250	16	225	10	200	12	200	16
95	16	250	16	225	10	200	12	200	16
96	16	250	16	225	10	200	12	200	16
97	16	250	16	225	10	200	12	200	16
98	16	250	16	225	10	200	12	200	16
99	16	250	16	225	10	200	12	200	16
100	16	250	16	225	10	200	12	200	16

PROJECT:-

REINFORCEMENT DETAIL OF
SINGLE CELL BOX

ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

SCALE

DATE

PROJECT NO. ORISSA STATE ROAD PROJECT / BOX CUL-01
 DRAWN BY: [Signature]
 CHECKED BY: [Signature]
 DATE: [Date]

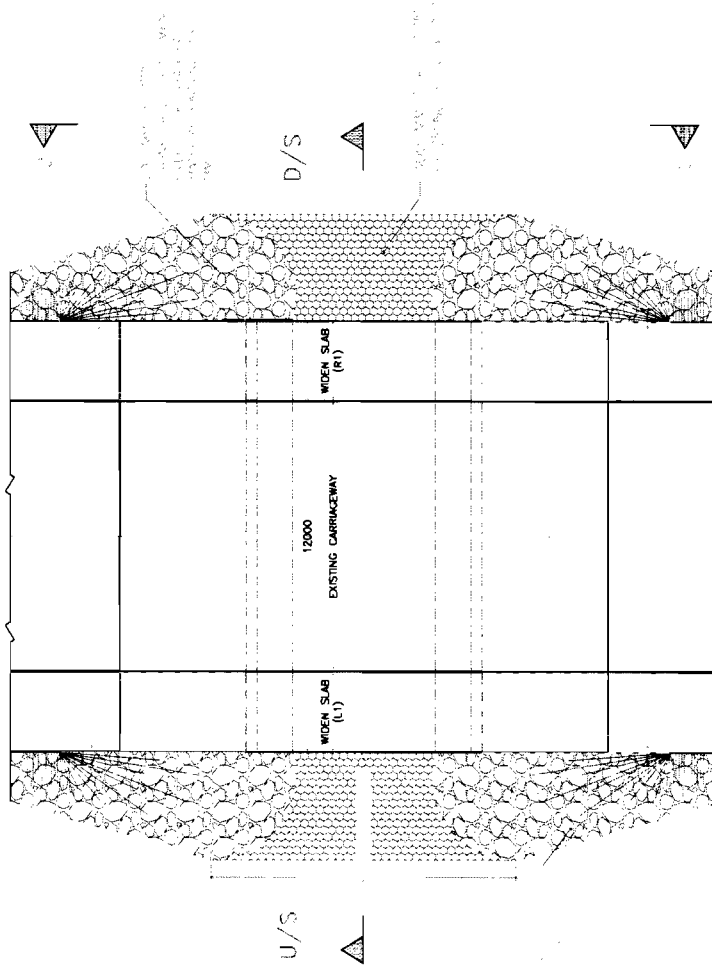
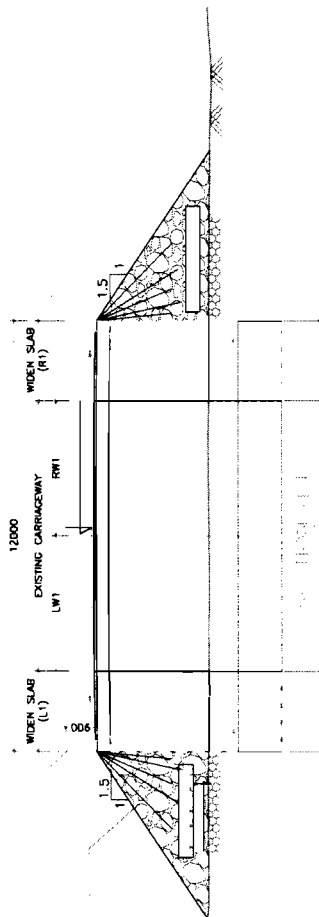
M/s RKD Construction
CO.



Chief Engineer
World Bank Projects, Odisha
EMPLOYER
Chief Engineer,
World Bank Project
O/o the E.I.C.(Civil), Odisha
Bhubaneswar

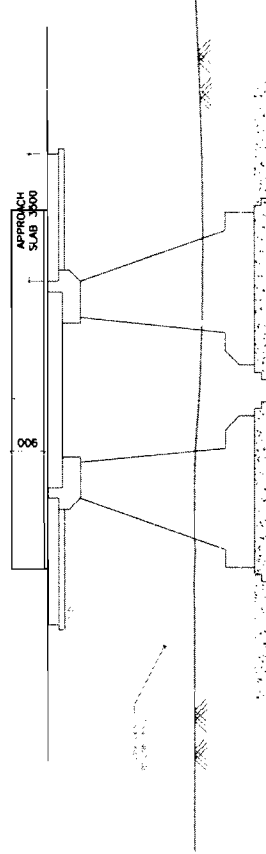
NOTES :-

- 1 ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
 - 2 DIMENSIONS ARE NOT TO BE SCALED ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
 - 3 CONCRETE GRADE IN SUPER STRUCTURE IS M-25. STEEL GRADE IS Fe 415.
 - 4 SUB STRUCTURE SHALL BE IN CONCRETE GRADE M-15 WITH SURFACE REINFORCEMENT #8 @200C/C BOTHWAYS
 - 5 GRADE OF CONC.
RCC SLAB - M-25
PCC - M-15
- REFERENCE DRAWING:-
1 OSRP/CEG/SH-17/SUB CUL/W-02



SLAB RR EXTENSION

Sl. No	Proposed No Chalmage	Existing Span	Proposed Formation Level	Camber/Super Elevation		Bed level / Invert Level	Direction of flow		Total Length to be widened		Length of Return wall	
				Left	Right		Left	Right	Left	Right	Left	Right
1	5127	1	79.343	-2.5%	-2.5%	77.584	L TOR	L TOR	3.4	1.5	3.41	3.60
2	7605	1	93.468	-2.5%	-2.5%	90.883	L TOR	L TOR	4.6	4.6	4.65	4.55
3	8008	1	90.484	-2.5%	-2.5%	87.889	R TOR	R TOR	2.5	2.5	4.65	4.65
5	13450	1	96.471	6.8%	-6.8%	94.546	R TOR	L TOR	2.5	2.5	4.50	2.95
5	25214	1	96.471	6.8%	-6.8%	94.546	R TOR	L TOR	2.5	2.5	4.50	2.95
6	38483	1	140.777	2.5%	-2.5%	138.355	L TOR	L TOR	2.5	2.5	3.36	3.42



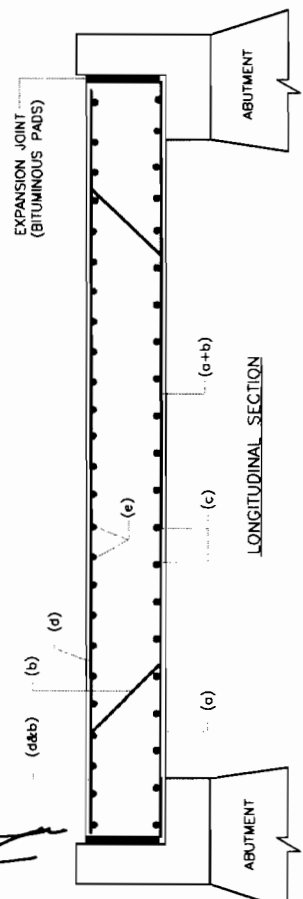
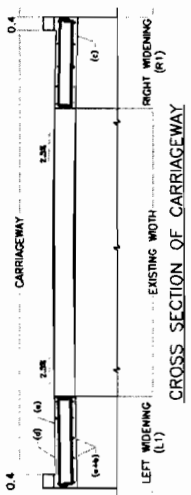
[Signature]
M/s. PWD Construction
CONTRACTOR

[Signature]
Chief Engineer
World Bank Projects, Odisha
EMPLOYER
Chief Engineer,
World Bank Project
O/o the P.P.C. (Civil), Odisha,
Bhubaneswar.

Project: Orrisa State Road Project Under World Bank Assistance

GENERAL ARRANGEMENT DRAWING
TYPICAL WIDENING FOR EXISTING SLAB CULVERTS

DRAWING NO. : WBP/OD/SH-17/SUB CUL/W-02
DATE : 12.08.2012
SCALE : 1:100
DESIGNED BY : [Name]
CHECKED BY : [Name]
APPROVED BY : [Name]
DATE : [Date]
C.E. World Bank Projects



NOTES :-
1 ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
2 DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
3 CONCRETE GRADE IN SUPER STRUCTURE IS M-25. STEEL GRADE IS Fe 415.
4 SUB STRUCTURE SHALL BE IN CONCRETE GRADE M-15 WITH SURFACE REINFORCEMENT #8 @200C/C BOTHWAYS.

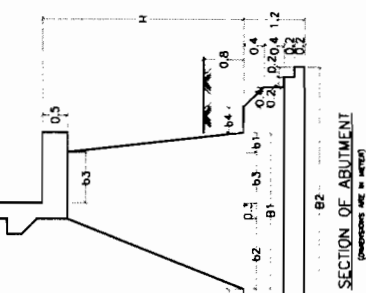
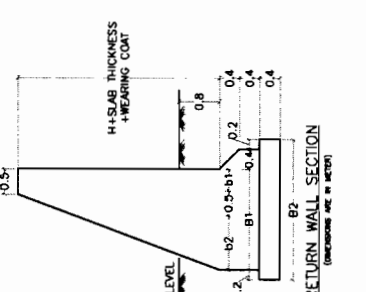
REFERENCE DRAWING :-
1 GSRP/CEG/SH-17/SUB CUL/M-01

TABLE OF DIMENSIONS FOR RETURN WALL

SPAN	UPTO 2 METRES			3 METRES			4 METRES		
	H	b1	b2	H	b1	b2	H	b1	b2
1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00
0.18	0.23	0.28	0.33	0.38	0.43	0.48	0.53	0.58	0.63
0.45	0.57	0.70	0.82	0.95	1.07	1.19	1.31	1.43	1.55
1.13	1.50	1.48	1.65	1.83	2.00	2.17	2.34	2.51	2.68
1.83	2.10	2.28	2.45	2.65	2.80	2.95	3.10	3.25	3.40

TABLE OF DIMENSIONS FOR ABUTMENT

Effective Span	6m and 5m			3m, 2m, 1.5m and 1m			3.5m and 4m		
	H	b1	b2	H	b1	b2	H	b1	b2
2.0m	2.5m	3.0m	3.5m	4.0m	1.5m	2.0m	2.5m	3.0m	3.5m
0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7
0.6	0.85	1.0	1.2	1.4	0.5	0.7	0.95	1.1	1.25
1.0	1.0	1.0	1.0	1.0	0.5	0.5	0.5	0.5	1.0
2.1	2.4	2.6	2.85	3.1	1.45	1.7	2.0	2.2	2.5
3.3	3.8	4.2	4.85	5.3	2.65	2.9	3.4	3.8	4.2



REINFORCEMENT TABLE FOR SLAB CULVERTS CONCRETE M-25, STEEL Fe 415

Clear Span (m)	Total depth slab (mm)	Uplifted Reinforcement			M A I N S L A B			Transverse Reinforcement			Longitudinal			K E R B S					
		o	l	Di	m	n	p	q	r	s	t	u	v	w	x	y	z		
1.0	210	16	280	1700	16	280	1700	10	300	1700	10	300	10	300	430	370	16	14	1700
2.0	260	16	280	2700	16	280	2100	10	300	2700	10	300	10	300	480	370	16	14	1700
3.0	370	16	240	3700	16	240	3700	10	300	3700	10	300	10	300	540	370	16	14	1700
4.0	380	20	280	4700	20	280	4870	10	300	4700	10	300	10	300	600	370	20	14	1700
5.0	430	20	240	5700	20	240	750	10	300	5700	10	300	10	300	650	370	20	14	1700
6.0	490	20	220	6700	20	220	810	10	300	6700	10	300	10	300	710	370	20	14	1700

Project: Orissa State Road Project Under World Bank Assistance

DIMENSION & REINFORCEMENT DETAIL OF SLAB & ABUTMENT TYPICAL WIDENING FOR EXISTING SLAB CULVERTS

DATE: 11/01/2011
SCALE: 1:100
DRAWN BY: S. K. SINGH
CHECKED BY: S. K. SINGH
DESIGNED BY: S. K. SINGH
PROJECT NO.: W.P./S.R.P./17/1/1000/01

M/s RKD Construction CONTRACTOR



Chief Engineer
World Bank Projects, Odisha
EMPLOYER
World Bank Project
O/o the E, J, C (Civil), Odisha
Bhubaneswar.
Page 135 of 136

AGREEMENT No 8 of 2012 - 13



GOVERNMENT OF ODISHA
WORKS DEPARTMENT

CIVIL WORKS CONTRACT
[PACKAGE No. OSRP-Bal-P03]

For

*Widening & Strengthening of existing carriageway to 2-lane road from
Berhampur to Taptapani (Km. 0/0 to 41/0 of SH – 17)
(Balance Work)*

under

Odisha State Roads Project

between

Chief Engineer, World Bank Projects, Odisha
on behalf of
Odisha Works Department, Government of Odisha

and

**M/s RKD Construction Pvt. Ltd.,
B-20, Chandaka Industrial Estate,
Patia, Bhubaneswar**

[VOLUME-II]

Agreement Value: Rs. 96,87,51,258.00

Project Management Unit, Odisha State Roads Project
Office of the Engineer-in-Chief (Civil), Odisha,
Nirman Soudha, Keshari Nagar, Unit – V, Bhubaneswar – 751 001

Dated: 4th January, 2013



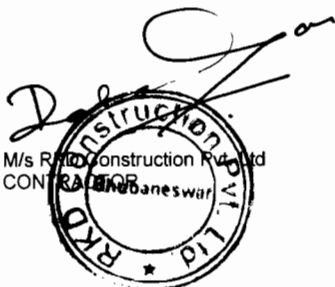
[Signature]
4/1/13
Chief Engineer
World Bank Projects, Odisha
EMPLOYER

Chief Engineer
World Bank Project
O/o the E.I.C.(Civil), Odisha
Bhubaneswar.

CONTENTS OF CONTRACT

Volume- I : Sections No.-1,2,3,4 & 6

Volume- II : Sections No.- 5 , 7 & Work Programe



5/11/12
Chief Engineer
World Bank Projects, Odisha
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Chief Engineer
World Bank Project
O/o the E.I.C.(Civil), Odisha
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SECTION 5: TECHNICAL SPECIFICATIONS



M/s. RKD Construction Pvt. Ltd
CO-1, Bhubaneswar



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EMPLOYER

Chief Engineer
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Bhubaneswar.

GENERAL TECHNICAL REQUIREMENTS

1.0. GENERAL REQUIREMENTS

The Technical Specifications in accordance with which the entire work described hereinafter shall be constructed and completed by the Contractor, and comprise of the following:

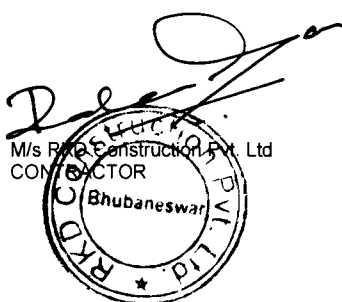
1.1 PART – I - General Technical Specifications

The General Technical Specifications shall be the “SPECIFICATIONS FOR ROAD AND BRIDGE WORKS” (FOURTH REVISION – 2001, Reprint 2006), as corrected in the original issued by the Ministry of Shipping , Road Transport & Highways(MORTH), Government of India and published by the Indian Roads Congress (IRC), with a cross reference to relevant Bureau of Indian Standards (BIS) for materials or other aspects not covered by the IRC.

1.2 PART - II - Supplementary Technical Specifications

The Supplementary Technical Specifications shall comprise various Amendments/Modifications/Additions to the “SPECIFICATIONS FOR ROAD AND BRIDGE WORKS” referred to in PART - I above and also **Additional Specifications** for particular item of works not already covered in PART-I.

- 1.2.1 A particular Clause or a part thereof in “SPECIFICATIONS FOR ROAD AND BRIDGE WORKS (FOURTH REVISION - 2001, Reprint 2006)” as corrected in the original referred in PART - I above, where Amended/Modified/Added upon, and incorporated in PART-II, referred to above, such Amendment/Modification/Addition supersedes the relevant Clause or part of the Clause.
- 1.2.2 When an Amended/Modified/Added Clause supersedes a Clause or part thereof in the said Specifications, then any reference to the superseded Clause shall be deemed to refer to the Amended/Modified/Added Clause or part thereof.
- 1.2.3 In so far as Amended/Modified/Added Clause may come in conflict or be inconsistent with any of the provisions of the said Specifications under reference, the Amended/Modified/Added Clause shall always prevail.
- 1.2.4 The Additional Specifications shall comprise specifications for particular item of works not already covered in PART - I.
- 1.2.5 The Sub-Clauses of the following Sections in the “Specifications for Road and Bridge Works (Fourth Revision – 2001, Reprint 2006) have been amended/modified/added upon 100, 200, 300, 400, 500, 600, 800, 900, 1000, 1500, 1600, 1700, 2000, 2200, 2600 & 2800.




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1.2.6 Additional Specifications

The following Clauses have been added to the 'SPECIFICATIONS FOR ROAD AND BRIDGE WORKS (FOURTH REVISION – 2001, Reprint 2006)'.

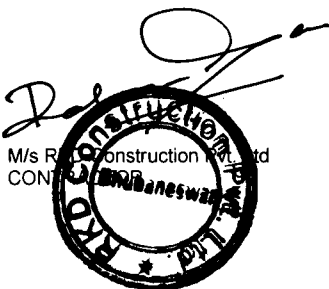
- A-1 Diversion and filling of existing water courses along the road alignment.
- A-2 Plantation of trees.
- A-3 Void Former.
- A-4 Embankment Construction with Fly Ash Modified Soil

1.2.7 In the absence of any definite provisions on any particular issue in the aforesaid Specifications, reference may be made to the latest codes and specifications of IRC and IS in that order. Where even these are silent, the construction and completion of the works shall conform to sound engineering practice as approved by the Engineer and in case of any dispute arising out of the interpretation of the above, the decision of the Engineer shall be final and binding on the Contractor.

1.2.8 The provisions of special conditions of contract, those specified elsewhere in the tender document, as well as execution drawings and notes, or other specifications issued in writing by the Engineer shall form part of the technical specifications of this project.

1.3 PART – III- Specifications for Building Works

1.4 PART – IV- Specifications and Guidelines for Environment Mitigation Plan




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PART – I

The General Technical Specifications shall be the “SPECIFICATIONS FOR ROAD AND BRIDGE WORKS” (FOURTH REVISION – 2001, Reprint 2006), as corrected in the original issued by the Ministry of Shipping , Road Transport & Highways(MORTH), Government of India and published by the Indian Roads Congress (IRC), with a cross reference to relevant Bureau of Indian Standards (BIS) for materials, testing acceptance or other such aspects not covered by the IRC.


M/s RKP Construction Pvt. Ltd
CONTRACTOR


Page 6


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PART- II

SUPPLEMENTARY TECHNICAL SPECIFICATION

(AMENDMENTS/ ALTERATIONS/ MODIFICATIONS/ ADDITIONS/DELETIONS TO
EXISTING CLAUSES OF GENERAL TECHNICAL SPECIFICATIONS-PART-I)

SECTION 100 GENERAL

Clause 102 Definitions

The following abbreviations shall be added in this Clause.

- “MORTH” - Ministry of Road Transport & Highways (This has been renamed as Ministry of Shipping, Road Transport and Highways)
“WBM” - Water Bound Macadam
“WMM” - Wet Mix Macadam
“MDD” - Maximum Dry Density (as per IS: 2720-Part 8)
“OMC” - Optimum Moisture Content

Wherever in the Specification, the phrase “Condition of Contract” is Mentioned, it shall mean Conditions of Contract part-I and II Contained in Section of Bidding Documents.

Clause 103 Add at the end of the clause

The latest edition of these standards or any other relevant standards till 30 (thirty) days before the final date of submission of the tender shall be adopted.

Clause 105 Scope of Work

Clause 105.3 Add the following below the existing clause

The contractor shall establish, adhere to monitor and maintain an adequate quality assurance programme (QA-Programme).

The QA-programme shall cover the quality assurance aspects of all services rendered, all items to be supplied and all construction activities to be performed under the Contract, also including temporary structures and equipment which will influence the quality of the completed works or the progress of the Contract.

The QA-programme shall as a minimum, cover subjects listed below:

- Organization and Management Responsibility
- Document and data control
- Construction programme
- Method statements




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- Process Control
- Working, inspection, testing and documentation procedures
- Safety and emergency procedures
- Control and documentation of purchasing and handling of materials
- Non-conformity and corrective action.
- Internal quality audits
- Servicing
- Education and training of staff
- Site Environment Plan

The general procedures of the QA-programme shall be submitted to the Employer and Engineer for approval not later than TWENTY EIGHT DAYS after the date of receipt of letter of acceptance. The special part of the QA-programme shall be submitted successively to the effect that it shall have been approved prior to the commencement of the activities to which the programme shall apply.

Clause 105.4 Add the following sentence

“If the Quality Assurance plan of the project as finalized and approved by the Engineer demands other time schedule for various submissions and approvals, the QA plan requirement will prevail”.

Clause 106 (a) Add the following sentence.

“The trial run is to be carried out laying the relevant pavement material and it is not to be part of the permanent works. The trial is to be carried out on prior approval of equipment by the Engineer-in-Charge.”

Clause 106 (b) Add the following sentence

“The Contractor shall furnish to the engineer the detailed technical literature and other relevant documents regarding the performance of plant/equipment to Engineer for approval prior to its purchase or mobilization on site.”

Clause 107 Contract Drawings

Clause 107.1 Add the following after the end of the para

Contractor shall ensure that the design and drawings for the bridges are approved by Engineer through the Employer.

Clause 107.3 Add the following after the end of the para

After careful study of the drawings issued by the Engineer, the Contractor shall, prepare, where necessary all supplementary and working drawings with necessary field/construction information and check for adequacy of

construction methods and procedure etc. and shall submit the same to the Engineer for approval prior to construction. Engineer shall be given not more than 7 days for review of these supplementary/working drawings and as directed, the contractor shall modify the drawings incorporating the comments and requirements of the Engineer.




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The Contractor shall prepare detailed construction drawings for each culvert on the basis of the drawings given in Bid Documents and get them approved by the Engineer. The drawings shall be submitted to the engineer at least 7 days before commencement of construction of culverts.

Clause 109 Setting Out

Clause 109.8 Add the following Para in the end of Clause 109.8

Surveying Equipments and Personnel

The Contractor shall provide the necessary surveying equipment, accessories, and surveyors and labours required for setting out and related measurements, including making available these to the Engineer and his representatives at different stages of the work. The surveying equipments shall meet the quality standards and shall be approved by the Engineer, in good working condition, available in adequate numbers and shall include interaila the following.

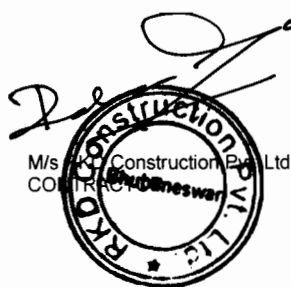
- i) Precision automatic level with micrometer attachment with tripods and leveling staff reading to 5mm accuracy by direct observation .
- ii) Total station with 2 spare batteries, charger, tripod, data capturing prisms in sufficient numbers, electronic embedded device data recorder, data packs and all necessary software for operation.
- iii) 3 meter straight edge
- iv) Field Umbrellas
- v) Ranging rods 50mm dia. 3m long straight with one end each metallic conical and painted alternatively black and white along the length.
- vi) Sprit Levels, plumb bobs
- vii) Invar/Steel tape graduated in meters, centimeter and millimeter.
 - a) 5m long
 - b) 30m long
- viii) Reference markers and pegs

The Contractor shall maintain the surveying equipments in good condition and calibrated from authorized agencies during the works and replace the ones which get worn out otherwise become unworkable.


The surveying equipments and related resources shall be provided under the general obligations of the Contractor requiring no separate payment.

Clause 109.10 Add new sub-clause

“Before carrying out any survey work the Contractor shall submit to the Engineer in writing for the approval of programme and methodology for the calibration of all optical and electronic survey equipment to be used on site during construction of the works. The Contractor will maintain calibration records for all such equipment in his site office, available at all times for inspection by the Engineer.”



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Clause 110 Public Utilities

Clause 110.2 Revise the clause as under

The Contractor's programme must take into account the period of notice and duration of diversionary works of each body as existing at site. The Contractor must also allow for any effect or these services and alterations upon the Works and for arranging regular meetings with the various bodies at the commencement of the Contract and throughout the period of the Works in order to maintain the required co-ordination. During the period of the Works, the contractor shall have no objection if the public utility bodies vary their decisions in the execution of their proposals in terms of programme and construction, provided that, in the opinion of the Engineer, the Contractor has received reasonable notice thereof before the relevant alterations are put in hand.

Clause 110.3 Add the following paragraph at the end of this Sub-clause.

Any utility services likely to be affected by the contractor's work shall be brought to the notice of the Engineer/ Employer and such work shall be undertaken only after getting written clearance from the Engineer.

Clause 111 Precautions for Safeguarding the Environment

This whole clause shall be modified by following.

Clause 111.1 General

The clause shall be read as follows

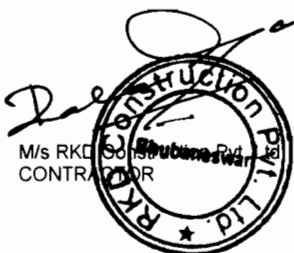
The contractor shall take all precautions for safeguarding the environment during the course of the construction of works. He shall abide by all rules, regulations and laws in force governing pollution and environmental protection that are applicable to the area where the works are situated.

On completion of the Works, all areas disturbed by the Contractor's construction activities shall be restored in their original condition, or as per the plan agreed prior to commencement of construction activities. .

The cost of such restoration work shall be deemed to be included in the rates, unless specifically mentioned in the contract.

Clause 111.2 Burrow pits for Embankment Construction

The clause shall be read as follows



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EMPLOYER

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O/o the E.I.C.(Civil), Odisha
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Burrow pits shall not be dug within the Right-of-Way of the road. The contractor will submit a Burrow Area Management Plan before opening up any burrow area to ensure the schedules of his excavation activities, safety arrangements during operation and rehabilitation after closure of the burrow pit. The contractor shall operate strictly adhering to the Burrow Area Management Plan.

The Contractor will ensure that proper excavation techniques are used to improve stability and safety of the burrow area. The excavation shall be carried out in such a way that the area does not inundate during monsoons and generate cesspools of water for breeding site. The stipulations in Clause-305.2.2 shall govern.

The cost of such safety and rehabilitation work shall be deemed to be included in the rates, unless specifically mentioned in the contract. Failure to adhere to the Environmental Mitigation Measures during construction will attract penalty as mentioned in the Contract data serial no. 37(c).

Clause 111.3

Quarry Operations

The clause shall be read as follows

The contractor shall obtain material from licensed quarries only after the consent of the forest department or other concerned authorities. The quarry operations shall be undertaken within the purview of the rules and regulations in force. Contractor shall ensure scheduling the movement of transport carrying material to and from site during non-peak hours. The contractor will ensure the schedules of his activities, safety arrangements during operation and rehabilitation after closure of the quarry. The contractor shall operate strictly adhering to the Burrow Area Management Plan.

The trucks carrying all types of construction material shall be covered with tarpaulin to prevent spillage and air pollution. Stockpiling of material shall be properly planned so as to ensure that no traffic jam takes place on the highway. In no case, overloading than the allowable capacity of vehicle shall be permitted.

The cost of such safety and rehabilitation work shall be deemed to be included in the rates, unless specifically mentioned in the contract. Failure to adhere to the Environmental Mitigation Measures during construction will attract penalty as mentioned in the Contract data serial no. 37(c).

Clause 111.5

Pollution from Hot Mix Plants and Batching Plants

Add the following paragraph at the end of this Sub-clause.




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The contractor shall ensure that noise, vibrations and emission conforms to the regulatory norms and be fitted with dust extraction unit. Failure to adhere to the norms will attract penalty as mentioned in the Contract data serial no. 37(c).

Clause 111.6 Substances hazardous to health

Add the following as 111.6.1 & 111.6.2

Clause 111.6.1 Precautions against Toxic Chemicals

The storage and use of any herbicide or other toxic chemical shall be strictly in accordance with the manufacture's instructions. The Engineer shall be given at least 7 working day's notice of the proposed use of any herbicide or toxic chemical.

A register of all herbicides and other toxic chemicals delivered to the site shall be kept and maintained up to date by the contractor. The register shall include name physical properties and characteristics, chemical ingredients, health and safety hazard information, safe handling and storage procedures, and emergency and first aid procedures for the product.

Clause 111.6.2 Precautions against generation of hazardous materials

The contractor shall not generally use or generate any material in the process work, which are hazardous to the health of persons, animals or vegetation. Where it is necessary to use some substance, which can cause injury to the health of the workers, the contractor shall provide suitable clothing or appliances to his workers, viz. ear plugs, helmets or dust masks or any other suitable devices.

Clause 112 Arrangement for Traffic during Construction

Clause 112.1 General

Delete the last sentence and add the following

"One week before undertaking work which would involve any obstruction whatsoever to traffic, the Contractor shall submit, for the Engineer's approval, a Traffic Control Plan.

The plan shall include:

- i) Typical drawing for temporary diversions in accordance with Sub Clause 112.3
- ii) Typical details of arrangements for construction under traffic including details of traffic arrangements proposed to be in place after the cessation of work each day.




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Special consideration shall be given in the preparation of the Traffic Control Plan for the safety of pedestrian and works delineation of the roadway at night.

Temporary diversions will be constructed only with the approval of the Engineer.

Clause 112.2

Passage of Traffic along a part of the Existing Carriage way under improvement:

Replace the clause as follows

If the existing part road is used traffic movement during construction, then contractor will maintain it at his cost only.

Most of the carriageway of the project has intermediate/ double lane carriageway. Due to poor in geometries and drainage considerations, the finished road surface require raising. The average formation width in plain terrain is about 8m to 10m and in the hilly terrain about 7m to 10m. None of the roads have granular sub base extending to the full formation width. For strengthening/widening of existing carriage way, part of the existing carriage way & shoulders shall be used for passage of traffic.

For facilitating passage of traffic during construction, following methodology shall be followed. However the contractor may suggest any improved method to be approved by the Engineer. If in the opinion of the Engineer, the arrangement suggested by the Contractor is better and shall ease the traffic movement, the same shall be adopted. But in such case the Contractor shall furnish the full traffic management plan along with the methodology of construction. The method is for general locations and any site specific arrangement shall be finalized in consultation with the Engineer.

The work shall be carried out on half-half basis. The length of widening/strengthening work on one side shall be limited to 500m at a place for which the traffic diversion shall be provided. There should be minimum 20m gap between the two successive patches. In case longer stretches are allowed, trapezoidal passing places of 20m outer edge with granular base course overlaid with surface dressing for additional width of 2.5m shall be provided at every 500m interval. But in no case the total length of work on one side should exceed 1000m except in the case if permitted by the Engineer. The next length of 2000m or less may be planned on the opposite side with a minimum clear distance of 200m from the preceding patch.

The proposed centerline of the alignment shall be marked. The toe line of the embankment shall be marked on both sides of the alignment. After clearing & grubbing, benching the slope & compacting the original ground, earth work in embankment with approved material shall be taken up to the design sub grade level in the side on which the traffic is proposed to be allowed. The type of earth and compaction requirement shall match the requirement of embankment or sub grade for which the section has been planned, as this



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section shall be retained as part of the road section. GSB (two layers) as per design requirement, conforming to the specification requirement of clause 401 of MORTH shall be provided up to the end of formation level and compacted. Over this granular base lower layer (WMM1) shall be provided up to the end of formation level and compacted. Over this primer and surface dressing shall be provided to allow the vehicles to ply on the prepared surface. During such time the existing carriageway width of minimum 3.5m and one side of treated shoulder (total of 5.0 m) shall be left for plying of vehicles. The prepared surface for traffic flow should be min of 4.0m.

The work for the other side including the carriageway portion shall be taken up, up to the sub base/sub grade/embankment level to match with the sub base of the former side and if decided, continue construction of granular base (two layers). Bituminous work as per design requirement is taken up over the prepared granular base, to allow the vehicles to ply on the prepared surface. The work for the other side from the granular base second layer (upper layer) shall be taken up and constructed till all the layers to reach the proposed formation level. The Contractor in consultation with the Engineer shall decide whether the side allowed to traffic can be taken up for construction of Granular base layer.

The work of providing earth embankment, sub-grade and granular sub-base material so carried out shall be paid under relevant items of bill of quantities. It may be ensured to provide minimum availability of width of 4.0m for plying of vehicles. At the end of diversion, a suitable link with proper gradient should be provided.


The contractor shall maintain the bypass/diversion made with the granular base material during the period of construction by way of watering, compacting, and making good loss of material after filling up of the rutting/depression etc. by additional quantity of granular materials. The cost of maintenance, making good the loss of material, watering, compacting, leveling and dressing along with additional quantity of granular base material shall be considered as incidental to the work.

The side on which the traffic was plying till then shall be made good after rolling, leveling, dressing along with any additional material required to bring the same to the required camber or super-elevation as the case may be and compacted to achieve the desired density to receive the next course of granular sub-base or base to match the other half.

The treated shoulder of the additional width if required to meet the minimum width criteria or passing of vehicles shall be either dismantled or retained. In case of dismantling the debris disposed off or reused as directed by the Engineer.

Where the excavation of the earth is required below the existing ground level, the toe line of the embankment shall be marked on both sides of the alignment. Then excavate the earth till the bottom of proposed sub grade




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level on one side from existing embankment toe line. Earth work in embankment with approved material shall be taken up to the design sub grade level in the side on which the traffic is proposed to be allowed. The type of earth and compaction requirement shall match the requirement of embankment or sub grade for which the section has been planned. Over this the same construction methodology should be adopted as mentioned above.

The work of providing earth embankment, sub-grade and granular sub-base material so carried out shall be paid under relevant items of bill of quantities. It may be ensured to provide minimum availability of width of 4.0m for plying of vehicles.

1. Traffic Safety Arrangements

The Contractor shall provide, fix in place & position adequate warning signs, speed breakers, barriers, marker posts etc., as per IRC: SP 55 - 2001 as well as other stipulations given in clause 112.4 to ensure safety of the traffic **at each part road location** as per the following table and maintain the same for the construction period. Provision of such traffic safety arrangements is mandatory and incidental to the work. No separate payment will be made on this account and no claim shall be entertained for providing the same. Non-performance of full or part of such items would lead to deductions pursuant to Clause 37(b) of Contract Data.

Sl. No	Item	Quantity
1.	Sign boards as per Technical Specifications Clause 801 including the Posts. Sheeting will be retro reflective type of high intensively grade with messages / borders/ signs etc.	
	(a) Men at Work (Triangular- 900mm side)	2 Nos
	(b) Overtaking Prohibited (Circular-600mm dia)	2 Nos
	(c) Compulsory turn (Circular-600mm dia)	2 Nos
	(d) Road Closed Take Part Road (Rectangular-1200x700mm)	2 Nos
2.	Wooden bullah delinator of 75mm dia and 2.0m height with white enamel painting with 3nos reflecting sticker in each	84 Nos
3.	Sand bag delinator containing 1 cft sand with 2nos reflecting sticker in each.	84 Nos
4.	Barricading tape	500 Rmt.

The Contractor shall be responsible for the dismantling and removal of all barricade and signages after completion of works.




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Clause 112.3

Passage of Traffic along a Temporary Diversion

Replace the clause with following

Temporary diversion to carry traffic, either at the site of cross drainage structures which are to be replaced or at any other locations, shall comply with the following:

- a) Embankments as per clause 305. The use of fly ash in temporary diversions will not be permitted.
- b) Pavement 5.5m wide consisting of 150mm granular sub-base as per clause 401, 150mm granular base course as per clause 404, 405 or 406 and a 20mm premix carpet with seal coat as per clause 511 or mix seal surfacing as per clause 512
- c) Earth shoulders 2.5m wide on both side of the pavement as per clause 407
- d) Minimum horizontal radius on curves 50m
- e) Maximum gradient 5 percent and minimum camber of 2.5 percent
- f) Restriction of maximum speed to 30kmph
- g) Cross drainage structures (if any) shall be adequate to deal with the water flow using adequate numbers of 1.0m dia NP-4 RCC Hume pipes in sufficient rows at all seasons at that location. Care should be taken of the waterway area and other relevant parameters of the existing and proposed replacement structures as given in the drawings. Causeways may only be overtopped and the road closed to traffic for short periods in extreme flood conditions.
- h) Adequate erosion protection must be provided.
- i) The Contractor shall be responsible for the design of temporary diversions and submit the designs and drawings to the Engineer for his approval.
- j) If the contractor finds it necessary to construct part of any diversion outside the Right of Way the temporary use of additional land shall be arranged for by him at his expense.
- k) Any roadside trees that have to be removed for the construction of temporary diversions shall be the responsibility of the Contractor.
- l) **Traffic Safety Measures:-** The Contractor shall provide, fix in place & position adequate warning signs, speed breakers, barriers, marker posts etc., as per IRC: SP 55 - 2001 as well as other stipulations given in clause 112.4 to ensure safety of the traffic **at each temporary diversion location** as per the following table and maintain the same for the construction period. Provision of such traffic safety arrangements is mandatory and incidental to the work. No separate payment will be made on this account and no claim shall be entertained for providing the same. Non-performance of full or part of such items would lead to deductions pursuant to Clause 37(b) of Contract Data.

Sl. No	Item	Quantity
1.	Sign boards as per Technical Specifications Clause 801 including the Posts. Sheeting will be	



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	retro reflective type of high intensively grade with messages / borders/ signs etc.	
	(a) Men at Work (Triangular- 900mm side)	4 Nos
	(b) Diversion Ahead (Rectangular- 1200x700mm)	2 Nos
	(c) Overtaking Prohibited (Circular-600mm dia)	2 Nos
	(d) Compulsory turn (Circular-600mm dia)	2 Nos
	(e) Diversion (Rectangular-1200x700mm)	2 Nos
	(f) Road Close (Rectangular-1200x700mm)	2 Nos
	(g) One Way (Rectangular-1200x700mm)	2 Nos
2.	Type-III Barricade	2 Nos
3.	Wooden bullah delinator of 75mm dia and 2.0m height with white enamel painting with 3nos reflecting sticker in each	68 Nos
4.	Sand bag delinator containing 1 cft sand with 2nos reflecting sticker in each.	68 Nos
5.	Barricading tape	420 Rmt.

m) The Contractor shall be responsible for the dismantling, removal and disposal of all temporary diversions, barricade and signages when approved by the Engineer.

Clause 112.4

Traffic safety and Control

Add as the continuation of the first paragraph

If there is traffic jam during construction, measures shall be taken to relieve the congestion.

Add the following sub-clauses under 112.4

Clause 112.4.1

Side Roads and Property Accesses

At all times, the Contractor shall provide safe and convenient passage for vehicles pedestrians and livestock to and from side roads.

Clause 112.4.2

Plant and Equipment

“During the day, plant and equipment working in a position adjacent to traffic and having a projection beyond the normal width of the item, for example,



grader blade shall have a fluorescent red marker attached to the outer end of the projection. During poor light conditions an additional traffic controller with an illuminated red marker shall direct traffic around such plant and equipment.

At night, all plant items and similar obstructions shall be removed from the normal path of vehicles, to provide a lateral clearance of at least 6m where practicable, with a minimum clearance of 1.2m.

Plant and equipment, within 6m of the normal path of vehicles, shall be lit by not less than two yellow steady lamps suspended vertically from the point of the obstruction nearest to a traffic lane, and one yellow steady lamp at each end of the obstruction on the side farthest away from the traffic lane”.

Clause 112.6 Measurements for Payments and Rate

Add below the second paragraph as follows

The contract rate also includes traffic safety and control as per clause 112.4 and maintenance of diversion of Traffic control devices as per clause 112.5. Failure to carry out the above activities, contractor shall be liable to be imposed with penalty for the first week of non-compliance report as mentioned in the contract documents. Beyond first week the same work will be carried out by third party, the cost of which is to be deducted from the contractor’s IPC in the same month.

Clause 113 General Rules for the Measurement of Works for Payment:

Clause 113.2 Measurements for Lead of Materials

Delete this Clause and replace with

“The rates in the Bill of Quantities are deemed to include the costs of haulage from source of supply to the plant as well as to the construction site as the case may be for all materials required for the Works.”

Clause 114 Scope of Rates for Different Items of Work

Clause 114.2 Item (ii) of clause 114.2 shall read as follows

A detailed Resource Based Construction Programme (using Microsoft Project) shall be submitted, which facilitate control of the progress of the works and consequences of any changes in terms of time. The programme shall also include detailed network activities for the submission and approval of materials, procurement of critical materials and equipment fabrication of special products/ equipment and their installation and testing and for all activities of the Contractor that are




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likely to affect the progress of work etc. including updating all such activities on the basis of decisions taken at the periodic site review meetings or as directed by the Engineer. The Contractor shall submit data via electronic media to the engineer in a form approved by the Engineer.

Add the following as item (xvii) of the sub-clause 114.2

Cost of all provisions for executing the work safely including all protective clothing, barriers, earplugs, shoes ,helmets etc.

Clause 114.4 Add the following new Clause as 114.4

If any work executed by the Contractor does not meet the specifications, it shall be deemed as rejected. The Engineer, in his sole discretion, may consider a proposal by the Contractor to retain, the element or part of the structure. The Contractor's proposal shall be supported by calculations, drawings and other data to prove the soundness of the proposal and shall clearly describe the additional measures required to ensure the intended performance of the structure. Rate/ price for the rehabilitation structure shall be settle mutually between the Engineer and the Contractor and in case of failure to arrive at an agreed rate, the Engineer's decision regarding the rate shall be final and binding.

Clause 115 Methodology and Sequence of Work

The Clause shall be read as follows

The Contractor shall submit methods statement. The methods statement shall be submitted in two parts.

The General part of the methods statement shall describe the Contractor's proposals regarding preliminary works, common facilities, and items that require consideration at the early stage of the contract. The General part shall be issued along with the first issue of the construction programme (refer clause 114.2) and shall include information on

- n) Sources of materials like coarse aggregate and fine aggregate, quantity and quality of materials available in different sources.
- o) Sources of manufactured materials like cement, steel, bitumen, emulsion, expansion joints, and bearings etc.. The contractor shall identify at least two sources for each of the items, he shall also submit samples/ test certificates of recently manufactured materials for the consideration of the Engineer.
- p) Location of site accommodation facilities, batching plant, hot mix plant, aggregate processing plant, WMM plant, field laboratory.
- q) Details of facilities/approaches for transportation of men, equipment and materials like concrete for construction of pavements, foundations and substructure in river bed.




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- r) Information on procedures to be adopted by the contractor for prevention and mitigation of negative environmental impact due to construction activities.
- s) Any other information required by the Engineer subsequent to the scrutiny of method statement submitted along with the bid.

The general part of the Q.A. Programme shall accompany the methods statement.

Special parts of the methods statement shall be submitted to the Engineer by the Contractor for each important item of work like construction of embankment and sub-grade, flexible & Rigid pavements, drain, pile foundations, concreting, repair and rehabilitation of existing structures, maintenance of project roads, diversions, concrete superstructure and for any other item as directed by the Engineer. These statements shall be submitted at least **28 days** in advance of the commencement of the activity or item of work, unless otherwise stipulated in the contract. The statement shall give information on

- i) Details of personnel both for execution and quality control of the work.
- ii) Equipment deployment with details of number of units, capacity, standby arrangements.
- iii) Sequence of construction, details of temporary or enabling work like diversions, cofferdams, formwork including specialized formwork for superstructure, details of burrow area, method of construction of embankment and sub-grade, pavements, piles, concreting procedures, details of proprietary process and products (e.g. details of proprietary pilling systems, bearings, expansion joints etc.) and details of equipment to be deployed. Wherever necessary, technical literature, design calculations and drawings shall be included in the methods statement.
- iv) Testing and acceptance procedures including documentation.
- v) Special part of the Q.A. programme referred in clause 105.3 for the particular item of work shall be submitted along with the methods statement for the concerned activity.
- vi) Engineer shall examine and approve the methods statement or direct the contractor to resubmit the statement with required modifications. The modified statement shall be submitted within 4 days of receipt of Engineer's comments.
- vii) The sole responsibility for the safety and adequacy of the methods adopted by the contractor shall rest on the contractor irrespective of any approval given by the Engineer.

Clause 115.1

Approval of proprietary product/ process/ system

Only proprietary products proven by International usage in comparable projects shall be permitted to be used. Fully authenticated details of licensing and collaboration arrangement shall be submitted by the manufacturer, where relevant.




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Within 90 days of award of work the contractor shall submit the following information for all proprietary products for approval by the Engineer.

- i) Name of manufacturer name of product/ process/ system complete details of the manufacturer of the product/ process / system shall be furnished. Details of projects where similar product/ process / system have been successfully used shall be furnished. Authenticated copies of license/ collaboration agreement shall be furnished.
- ii) General features of the product/ product process/ system
- iii) Detailed write up with methods statements shall be furnished for each product/process/ system. This shall include complete working drawings & installation drawings, technical specifications covering fabrication, materials, system of corrosion protection etc.
- iv) Details of product development and development testing
- v) Acceptance test and criteria
- vi) Manufacturer shall submit a quality assurance system document. Details of acceptance test and criteria of acceptance shall be furnished in this document.
- vii) Installation procedure& demonstration
- viii) Maintenance procedure and schedule
- ix) Warranty proposal

The Engineer may order any additional test for the purpose of accepting the product. The facility for such additional tests shall be made available by the manufacturer. The charges of these additional tests shall be borne by the Employer.

Clause 121 Field Laboratory

Clause 121.1 Add the following at the end of the clause

This facility including its erection, running will be provided and maintained by the Contractor, as incident to work and no separate payment shall be made for this item.

Clause 121.2 Description

Delete this Clause and replace with

“The Contractor shall construct a fully furnished and equipped field laboratory. All equipment shall conform to accepted national and international standards and shall be subject to the approval of the Engineer.

The laboratory will be located at a site approved by the Engineer and must be of adequate size to perform all the tests required under the contract including sufficient light, uninterrupted electricity and water supply etc. Office space of about 30 Sqm must be provided in the laboratory for the exclusive use of the Engineer and Employer / Employer’s representative with adequate facilities such as toilets, Air conditioners, first aid box, uninturrepted power and water supply etc.




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The contractor shall provide the field laboratory within one month from the date of the commencement of the work. Prior to this, the contractor must make suitable alternative arrangements for the testing of materials at his cost, which are acceptable to the Engineer.

The Contractor shall be responsible for the provision of adequately experienced and qualified laboratory staff, in sufficient numbers to be able to meet all testing requirements to the approval of the Engineer, and for the supply of all transportation of staff, testing equipment and sample necessary to allow the testing to be performed in a time scale compatible with the needs of the Site.

Contractor shall arrange to maintain the laboratory in satisfactory manner and will carry stocks of spare equipment and laboratory consumables until the issue of Taking Over Certificate.

Clause 121.3

Laboratory Equipment

This Clause shall read as under

“The following items of laboratory equipment procured from reputed manufacturers duly approved by the Engineer shall be provided in the field laboratory.”

Laboratory equipment shall be provided by the Contractor for laboratory, sufficient to carry out all the field and site quality acceptance testing required in the Specifications. It shall include the following:

A. General

i)

Balance

a) 10 kg capacity semi-self indicating type – Accuracy 1 gm

Electronic

1 No.

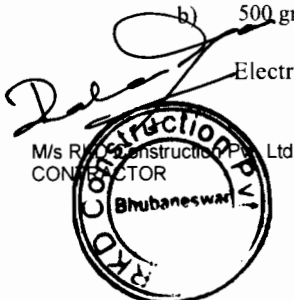
Mechanical


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b) 500 gm capacity – Accuracy 0.01 gm

Electronic

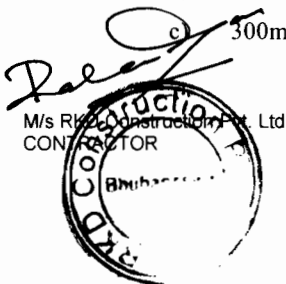
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



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| | Mechanical (semi-self indicating) | 1 No. |
| c) | Chemical balance (electronic) 100 gm capacity
Accuracy 0.001 gm | 1 No. |
| d) | Pan balance 5 kg capacity Accuracy 0.5 gm. | 3 Nos. |
| e) | Platform scale – 300 kg capacity | 1 No. |
| f) | Triple beam balance – 25 kg capacity Accuracy 1 gm | 2 Nos. |
| ii) | Oven-electrically operated, thermostatically controlled (including thermometer), stainless steel interior | |
| | a) Temperature range ambient to 300° C, Sensitivity 1° C, capacity 120 Litre. | 1 No. |
| | b) Temperature range, ambient to 150° C, sensitivity 1° C, capacity 250 Litre. | 1 No. |
| iii) | Sieves : As per IS 460:1962 | |
| | a) Test sieve of G.I 450mm internal dia. as per IS complete with lid and pan of hole sizes 75mm, 63mm, 53mm, 37.5mm, 26.5mm, 13.2mm, 9.5mm, 6.7mm, and 4.75mm. | 2 Sets |
| | b) Test sieve set 200mm internal dia (brass frame and steel/or brass wire cloth mesh) as per IS complete with lid and pan of aperture sizes 2.36mm, 2mm, 1.18mm, 600micron, 425micron, 300micron, 150micron ,90 micron and 75micron. | 2 Sets |
| iv) | Sieve shaker capable of taking 200mm and 450mm dia sieves-electrically operated with time switch assembly | 1 No. |
| v) | 200 tonnes compression testing machine electric cum manually operated | 2 Nos. |
| vi) | Stop watches 1/5 sec. accuracy | 2 Nos. |
| vii) | Glassware comprising beakers, pipettes, dishes, measuring cylinders (100 to 1000cc capacity) glass rods and funnels, glass thermometers range 0° C to 100° C and metallic thermometers range upto 300° C. | 1 Doz.
Each |
| viii) | Hot plates 200mm dia (1500 watt.) | 6 Nos. |
| ix) | Enamel trays | |
| | a) 600mm x 450mm x 50mm | 6 Nos. |
| | b) 450mm x 300mm x 40mm | 6 Nos. |
| | c) 300mm x 250mm x 40mm | 6 Nos. |




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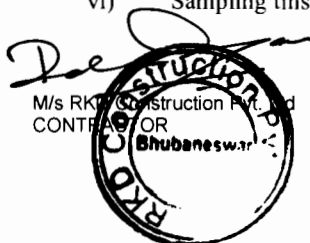
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d)	Circular plates of 250mm dia	6 Nos.
x)	Water still, 3litre/hr. with fittings and accessories	1 Set
xi)	Aluminium Tins	
a)	50mm x 30mm	36 Nos.
b)	55mm x 35mm	36 Nos.
c)	70mm x 45mm	36 Nos.
d)	70mm x 50mm	36 Nos.
e)	80mm x 50mm	36 Nos.
xii)	Riffle box of slot size 50mm	1 No.
xiii)	Spatula set of 100 and 200 long	3 Sets
xiv)	Water testing kit	1 Set
xv)	Chemicals solutions and consumable	As reqd.
xvi)	Chloride Testing kit for chemical analysis of chloride content	1 No.
xvii)	ION Exchange kit for rapid determination of sulphate content	1 No.
xviii)	First aid box	1 Set

B. For Soils and Aggregates

i) Liquid limit and plastic limit

a)	Liquid limit device with Casagrande and grooving tools and as per IS – 2720	2 Nos.
b)	Single point LL device	1 No.
c)	Moisture content cans	50 Nos.
d)	Ground glass plate with rounded edges 600mm x 600mm x 10mm	2 Nos.
ii)	Hydrometer analysis	
a)	High speed stirrer with stainless still beaker	1 No.
b)	Soil hydrometer set including jar	1 Set
iii)	Sampling pipettes fitted with pressure and suction inlets, 10ml. Capacity	1 Set
iv)	Laboratories compaction	
a)	Compaction apparatus (Proctor) complete with collar, base plate & 2.5kg rammer	2 Nos.
b)	Compaction apparatus (heavy) complete with collar, base plate and 4.5kg rammer	3 Nos.
v)	Sand pouring cylinder (150mm) with conical funnel and top and base plate (with 152mm dia of sand cone)	4 Sets
vi)	Sampling tins with lids 100mm dia x 75mm ht. 1/2kg capacity	30 Nos.




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vii)	Laboratory C.B.R. testing equipment to the requirements of IS and consisting of following :	1 Set
a)	Floor mounted electro-mechanical load frame 5 tonne capacity with automatic strain control	1 No.
b)	CBR moulds complete with collar, base plate, etc.	18 Nos.
c)	Swell stands for holding dial gauge	9 Nos.
d)	CBR plunger with penetration dial gauge holder	1 No.
e)	Surcharge weight with central hole of 2 kg. weight	40 Nos.
f)	Spacer disc with handle	2 Nos.
g)	Perforated brass swell plate with adjustable cap on handle	18 Nos.
h)	Soaking tank for accommodating 9 CBR moulds	1 No.
i)	High tensile steel calibrated proving rings of 1000 kg, 2500 kg and 5000 kg capacity	1 Set
j)	Dial gauge, 25mm travel-0.01mm/division	12 Nos.
x)	Nuclear gauge for density and moisture content determination	1 Set
xii)	Speedy moisture tester complete with carrying case and supply of reagent	2 Nos.
xiii)	Sand equivalent apparatus complete along with chemicals to the requirements of IS	1 Set
xiv)	Reagent grade Sodium Sulphate for soundness test of aggregate chemical Sodium Sulphate	30 kgs.
xvii)	Core cutter apparatus 10cm dia. 10/15cum length height complete with 20kg hammer	1 Set
xix)	Standard measures of 30, 15, 3 litre capacity along with tamping rod	1 Set
xx)	Unconfined compression test apparatus	1 Set
xxi)	Flakiness index test apparatus	1 No.
xxii)	Elongation index test apparatus	1 No.
xxiii)	Aggregate crushing value / impact test apparatus	1 No.
xxiv)	Los-Angeles abrasion apparatus as per IS 2386 (Part 4) 1963	1 No
xxv)	Standard Penetration equipment	1 No

C. For Bitumen and Bituminous Mixes

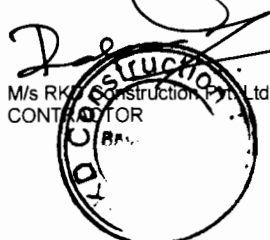
i)	Constant temperature water bath for accommodating bitumen test specimen, electrically operated, and thermostatically controlled, stainless steel interior, temperature range ambient to 80° C	1 No.
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| ii) | Bitumen penetrometer automatic type, including adjustable weight arrangement, and needles | 1 Set |
| iii) | Centrifugal type motorized bitumen extraction apparatus with stock of solvent & filter papers | 1 Set |
| iv) | Bitumen laboratory mixer planetary action, 2 litre capacity, including required accessories electrically operated and fitted with heating jacket | 1 No. |
| v) | Marshall compaction apparatus and complete with electrically operated automatic loading unit, compaction pedestal, heating unit, head breaking assembly, flow meter, load transfer bar, specimen moulds 100mm dia with base plate, collars, specimen extractor, compaction hammer 4.53kg x 457mm fall, (excluding constant temperature bath) | 1 Set |
| vi) | Digital type thermometer reading 0-300° C range, accuracy 2° C | 2 Nos. |
| viii) | Ring and Ball Apparatus as per IS 1205 - 1978 | 1 Set |
| x) | Tar Viscometer IS 1206 (Part III) – 1978 | 1 Set |
| xi) | Apparatus for Determination of Ductility Test as per IS 1208 – 1978 | 1 Set |
| xii) | Pen Sky – Marten closed Tester for testing flash and fire point as per IS 1209 – 1978 | 1 Set |
| xv) | Apparatus for Determination of Loss on Heating IS-1212-1978 | 1 Set |
| xvi) | Apparatus of Determination of specific Gravity IS-1202-1978 | 1 Set |
| xv) | Automated Asphalt content gauge (Nuclear or equivalent) | 1 Set |
| D. For control of profile and surface evenness | | |
| iii) | Towed Fifth Wheel Bump Integrator | 1 No. |
| iv) | Camber templates 3-lane straight run cross-section | 4 Sets. |
| E. For Cement, Cement Concrete and other Materials | | |
| i) | Vicat needle apparatus for setting time with plungers, as per IS-269-1968 | 1 Set |
| ii) | Moulds | |
| a) | 150 mm x 300 mm ht. Cylinder with capping component along with the capping set and compound as per IS | 48 Nos. |
| b) | Cube 150 mm, moulds and 100 mm (each size) as per IS | 36 Nos. |
| c) | Beams 750 mm x 150 mm x 150 mm moulds | 18 Nos. |
| iii) | High frequency mortar cube vibrator for cement testing | 1 No. |
| iv) | Concrete mixer power driven, 1 cu. ft. capacity | 1 No. |




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v)	Variable frequency and amplitude vibrating table as per the relevant IS	1 No.
vi)	Equipment for slump test /compacting factor Apparatus complete	4 Nos.
vii)	Equipment for determination of specific gravity for fine and coarse aggregate as per IS 2386 (Part 3) 1963	4 Nos.
viii)	Flexural attachment to compression testing machine.	1 Nos.
ix)	Core cutting machine with 10cm dia diamond cutting tool	1 No.
x)	Needle vibrator	1 No.
xi)	Air entrainment meter	1 No.
xii)	Le-Chatelier apparatus for Soundness testing of cement	1 Set
xiii)	Blain Air Permeability apparatus	1 No.

All equipments shall confirm to accepted National/ International standards and shall be subject to the approval of the Engineer.

Full complement of listed equipment procured from an internationally reputed manufacturer, after procurement and approval of Engineer shall be incidental to the work and no payment shall be made to the Contractor.

Clause 121.3.5 Add New Sub-Clause:

For Control of Profile and Surface Evenness

i)	Theodolite	2 sets
ii)	Total Station	2 sets
iii)	Precision automatic level	4 sets
iv)	Precision staff	4 sets
iv)	Camber templates full width and half width	
a)	Crown type cross-section	4 sets each
b)	Straight run cross-section	4 sets each
	Invar /Steel Tape a) 3 m long	4 sets
	b) 5 m	4 sets
	c) 10 m	4 sets
	d) 20 m	4 sets
	e) 30m	4 sets
	f) 50m	4 sets




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Clause 121.3.6 Add New Sub-Clause:

In addition to clause 121.3, any equipment which is not mentioned in this clause but which is necessary for the work for complying with the provisions of the contract and Section 900 of MORTH specifications or as required by the engineer shall be provided by the contractor. No extra payment shall be made to the contractor and it will be considered as incidental to the work.

Clause 121.6 Deleted.

Clause 121.7 Substitute this Sub-Clause by the following:

“There is no separate item in the Bill of Quantities for establishing and maintenance of the laboratory and supply, erection maintenance of equipment and also running cost of testing. The rates quoted for the items in the BOQ by the Contractor shall be deemed to cover the cost of all these items.”

Clause 122 Deleted

Clause 124 Deleted

Clause 125.2 Replace the last but one line with :

The contractor shall supply the digital form of the printed photographs clearly recorded in CD.

Clause 125.3 Replace the first para as :

Supply of two copies of colour record photographs mounted in the albums and the digital form of the printed photographs recorded in a CD shall be measured in number of record photographs supplied.

Clause 125.4 Replace the 1st line of the last para

The photographs and materials including digital version in CD shall form a part

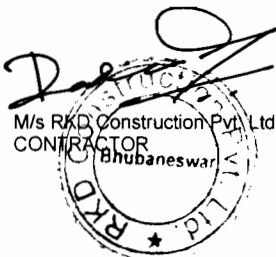
Clause 126.1 Replace the last line of the 1st para

The video data in form of DVD shall be of acceptable quality and the file shall be capable of producing colour pictures.

Clause 126.2 Replace this para with :

The measurement shall be by number of sets of edited master DVD each with four copies thereof.

Clause 126.3 Replace the word Cassette with DVD




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SECTION 200 SITE CLEARANCE

Clause 201 Clearing and Grubbing

Clause 201.1 Scope

Replace with following para

This work shall consist of cutting removing and disposing of all materials such as trees of girth up to 300 mm bushes shrubs stumps, roots, grass weeds etc. and top soil 150mm minimum thickness rubbish etc. which in the opinion of Engineer is unsuitable for incorporation in the work including draining out stagnant water if any from the area of road land, drain, cross drainage structure and other area as specified in the drawing by Engineer. It shall include necessary excavation by harrow discs or any other suitable equipment back filling of the pits, by suitable soil, resulting from uprooting of trees & stumps and making the surface in proper grade by suitable equipment and compacted by power roller to required compaction as per Clause 300. The work also includes handling salvaging and disposable of cleared material. Clearing and grubbing shall be performed less than one month in advance of earthworks operation and in accordance with requirement of these specification. Areas requiring cleaning and grubbing shall be determined by the Engineer.

Clause 201.5 Measurements for Payment

Add at the end of first para

“Cutting including removal of foundation of sign boards, hoarding boards, concrete posts, km stones etc. and back filling of pits shall be considered incidental to the clearing and grubbing operations”

Add the following paragraph:

“The removal from site and disposal of all materials obtained from clearing and grubbing operations, which in the opinion of the engineer cannot be used or auctioned shall be included in the Contract unit rate”.

Clause 201.6 Rates

Clause 201.6.1 Replace the second sentence as follows

These will also include removal of stumps of trees of any girth left after cutting of trees carried out by any agency, removal of sign boards, hoarding boards, concrete post, km stones including their foundation, excavation and back filling to required density, where necessary and handling, salvaging and piling and disposing of the cleared materials with all lifts and up to all lead.




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Clause 202.5

Disposal of Materials

Replace the para with the following

“All materials obtained by dismantling shall be the property of the contractor. The materials may be reused in the works in part or in full quantity if permitted by the Engineer for which no cost towards value of material, transportation etc. shall be charged to the contractor, nor the contractor shall pay any salvage value to the Employer. The materials which have to be disposed off, shall be done by the contractor at his own cost at the approved location as per direction and approval of the Engineer.

No material , on account of dismantling shall be returned back to the Employer. The dismantled materials shall be completely removed form the site.”

Clause 202.7

Rates

Add the following at the end of the para

“The cost of carriage of materials to disposal sites is deemed to be included in the rates for dismantling.”

SECTION 300 EARTH WORK, EROSION CONTROL AND DRAINAGE

Clause 301

Excavation for Roadway and Drains

Clause 301.3.7

This clause shall be read as under:

“In works involving widening of existing pavements or providing paved shoulders the existing shoulder/verge/ median shall be removed to its full width. The sub-grade material within 0.2m deep from the lowest part of the pavement for widened portion or paved shoulders shall be loosened and re-compacted as per Clause 305 to a density not less than 97% of maximum dry density determined according to Is: 2720 (Part 8). Any unsuitable material encountered in this portion of subgrade shall be removed and replaced with suitable material and compacted in accordance with Clause 305”.

Clause 301.3.11

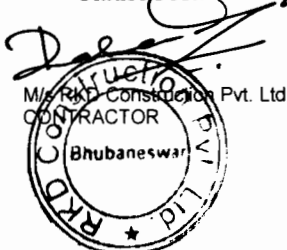
Disposal of excavated materials

Replace the last para

Unsuitable and Surplus material which in the opinion of the Engineer cannot be used in the works, shall be removed from site by the Contractor and disposed of at the nearest pit or other approved disposal location **with all lead and lifts** in accordance with all statutory requirements.”

Clause 301.8

Delete item (v) of last para and replace with:




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(v) Disposal of surplus material with all lead and lifts ...cum'

Clause 301.9 Rates

Clause 301.9.2 This Clause shall read as under

"The Contractor unit rate for loosening and re-compacting at sub-grade level shall include full compensation for loosening to the specified depth, removing the loosened soil outside the roadway excavation, rolling the surface below, breaking the clods, spreading the excavated soil in layers watering where necessary and compacting to the requirements."

Clause 305 Embankment Construction

Clause 305.2 Materials and General Requirements

Clause 305.2.1 Physical requirements

Clause 305.2.1.5 Add the following at the end of first sentence

The material to be used in sub-grade should satisfy the requirement of 4 day soaked design CBR not less than 10% ,when tested as per IS: 2720 (Part 16) at 97% of maximum laboratory dry density (IS:2720-Part 8).

Clause 305.2.2.2 Burrow materials

The first Para graph of this clause shall be read as under

"No burrow area shall be made available by the Employer for this work and Burrow pits along the road and with in the Right of Way (ROW) is prohibited. The arrangement for the source of supply of the material for embankment meeting the prescribed specifications as well as compliance to the different environmental requirements in respect of excavation and burrow areas as stipulated from time to time by the Ministry of Environment and Forest, Government of India and the local bodies, as applicable shall be the sole responsibility of the Contractor."

Add after the second para

The top soil of the burrow area selected by the contractor shall be removed and preserved. Care shall be taken not to create any low lying area; if any burrow pit is created, the same shall be filled up with pond/flyash/inertslag covered with 0.5m thick soil wherever technically feasible. In all cases the top soil shall be placed over the burrow area and watered for three days. No part of the burrow area shall be left uncovered to expose scar marks. The Table 300-2 shall be read as under


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Table 300-2: Compaction requirements for embankment and sub-grade

Sl. No.	Type of Work/Material	Relative compaction as % of max. laboratory dry density as per Is: 2720 (Part 8)
1.	Sub-grade and earthen shoulders	Not less than 97
2.	Embankment	
	a) Up to 6m height	Not less than 95
	b) High embankment (exceeding 6m height)	Not less than 97
3.	Expansive clays (DFS <50%)	
	a) Subgrade and 500mm portion just below the subgrade	Not allowed
	b) Remaining portion of the Embankment	Not less than 90

Para 8 of this clause given below Table 300-2 shall read as under

“the contractor shall, at least 7 working days before commencement of compaction, submit the following to the Engineer for approval:

- (i) The values of maximum dry density and optimum moisture content obtained in accordance with IS: 2720 (Part 8) for each fill materials he intends to use.
- (ii) The graphs showing values of density against moisture content from which each of the values in (i) above of the maximum dry density and optimum moisture content were determined.
- (iii) The dry density –moisture content –CBR relationships for heavy compactive efforts corresponding to IS: 2720 (Part 8) for each of the fill materials he intends to use in the sub-grade,”

Clause 305.4.3 Earth work over existing road surface

Add at the end as (iv)

(iv) Where the existing bituminous layer to be scarified, the scarification shall be done by using suitable equipment as per direction of Engineer.




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Dismantled materials shall be re-used in the new pavements if it conforms to the specifications requirements. The following uses of dismantled materials are suggested.

1. The surplus materials, reclaimed from the existing bituminous layer may be used in the sub-grade of service road, intersection and junctions after breaking in to pieces of less than 75mm particle size and as directed by the Engineer. If directed by the Engineer the material shall be mixed with materials brought from burrow area. Compaction shall be carried out to the requirements of clause 305.3.6.
2. The dismantled bituminous material may be used as fill in the earthen shoulder; diversion roads and intersections/ junction of feeder roads provided the material conforms to the relevant clauses of earthwork.

Clause 305.4.4 Embankment and Sub-grade around structures.

Para-3 delete the last line and substitute it with

“compacted thoroughly to 98% MDD”.

Clause 305.4.6 Embankment construction under water.

Insert the following as the second para

At locations where water table is high and the soil has potential for rapid and relatively great migration of moisture by capillarity, provision of sand blanket of 100mm thickness of approved grain size shall be provided at a level of 200 mm below bottom of subgrade by way of cut off extending across the full width of the embankment so that the same will act as an effective capillary cut off as per IRC:34


Clause 305.4.7 Earth work for High embankment

The second para shall be read as follows

To ensure stability during construction, it is necessary to control rate of construction especially in both side approaches of ROB's and Bridges which is achieved by stage construction i.e. each period of construction activity is followed by a period of inactive period. The embankment foundation shall be prepared and a drainage layer provided.

No embankment work shall proceed until the foundation have been inspected by the Engineer-in-Charge and approved. In the first month the total height of construction should be limited to maximum 6.0metre only. The balance embankment construction should be done after a rest period of two months for strength gain and consolidation. The rest period need not be given in case the construction of initial 6-metre height of embankment takes more than 4 months time. However, based on the available subsoil data the contractor may suggest his loading schedule or any other method to take care of the excessive settlement problem for approval of the engineer.




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Clause 305.9.1 Add “including removal of top soil” after word “materials” appearing in first line of item (v).

Clause 306 **Soil Erosion and Sedimentation Control**

Clause 306.4 **Measurement for payment**

Substitute Clause 306.4 as follows

“ All temporary sedimentation and pollution control works shall be deemed as incidental to the earthwork and other items of work and as such no separate payment shall be made for the same.”

Clause 306.5 **Rates**

This Clause shall be deleted

SECTION 400 SUB-BASES, BASES (NON-BITUMINOUS) AND SHOULDERS

Clause 401 **GRANULAR SUB BASE**

Clause 401.2 **Materials**

Replace the clause with the following.

The Materials to be used for the work shall be crushed stone aggregate only. The materials shall be free from organic or other deleterious constituent and confirm to Grading I of Table 400-2.

Clause 406. **WET MIX MACADAM SUB-BASE/BASE**

Clause 406.2. **MATERIALS**

Clause 406.2.1 **Aggregate**

Clause 406.2.1.1 **Physical requirements:**
Add at the end of first paragraph

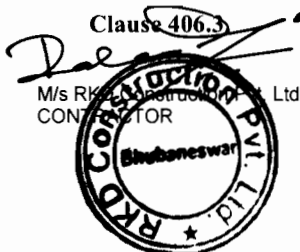
The fraction of materials passing through 4.75 mm sieve shall be crusher run screening only. The river sand or quarry sand shall not be permitted either as such or mixed with crusher-run-screening in the Wet Mix Macadam.

Add the following at the end of the paragraph:

Soundness test shall be carried out in accordance with IS : 2386 (Part- 5). The average loss of weight of coarse aggregate after 5 cycles shall not exceed 12% when tested with sodium sulphate and 18% when tested with magnesium sulphate as specified in IS: 383.

Clause 406.3

CONSTRUCTION OPERATIONS




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Clause 406.3.1. Preparation of base

404.3.1 shall be applicable by replacing the work “Water Bound Macadam” by “Wet Mix Macadam”.

Clause 406.3.3 Replace first para with :

Wet Mix Macadam shall be prepared in an approved mixing plant of suitable capacity having provision for controlled addition of water and forced/positive mixing arrangement like pugmill. .

Add the following at end of 2nd para

Unless otherwise instructed by the Engineer , the moisture content at the time of compaction shall be between 80% and 120% of the optimum moisture content

Clause 406.3.4 Add after the second para with the following:

All the layers of WMM course shall be spread only by a Mechanical Paver Finisher and compacted as per clause no. 406.3.5.

Clause 406.3.5. Delete second sentence of first para.

Substitute para 7 of this clause as follows :

Rolling shall be continued till the density achieved over the full thickness of the material laid is at least 98% of the maximum dry density as determined by the method outlined in I.S.:2720(part 8) and satisfies the requirements of Sub Clause 903.3.

Clause 407 SHOULDERS, ISLANDS AND MEDIAN

Clause 407.2 Materials

Add after first para as follows

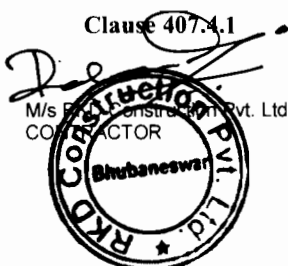
The hard shoulder shall consists of minimum 150mm thick granular/ moorum layer having liquid limit less than 25% and PI between 3% to 6%.

Replace second para with :

Median/Traffic islands shall be raised and kerbed at the perimeter and the enclosed area filled with agriculture soil and suitably covered with grass turf/shrubs as per clause 307 and/or paved as per clause 409.3.4 or 409.3.5.

Clause 407.4 Construction Operations

Clause 407.4.1 Shoulder




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Add as follows after para 4

The hard shoulder shall be compacted not less than 98% of maximum laboratory dry density as per IS:2720 (Part-8).

Clause 502 PRIME COAT OVER GRANULAR BASE

Clause 502.1 Scope

Add the clause as follows

The work shall consist of Priming (spraying) of liquid bituminous materials on the surface of non-bituminous granular base course.

Prime coat is not to be regarded as a substitute for tack coat, the objective of which is to ensure a proper bond between the surface being paved and the new bituminous course being placed over it.

Clause 502.2 Materials

Cationic bitumen emulsion SS-1 grade conforming to IS:8887 shall be used as primer. The quantity of bitumen emulsion for WMM types of surfaces shall be 0.7-1.0 Kg/m².

The correct quantity of primer will be the maximum amount that can be absorbed by the surface without causing run-off of excessive primer (some times referred as "finger" to form at the lower edges of the primed area) and is to be decided by the supervising engineer at the site.

Clause 502.3 Weather and Seasonal limitations

Replace the clause as follows

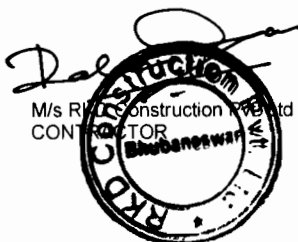
Bitumen emulsion grade SS-1 as well as Cutback Bitumen as Primer shall not be applied on wet surface. The moisture content in the surface to be primed shall not exceed 3.5%. Primer shall not be applied during dust storm, rainy, foggy or windy weather. The ambient temperature during priming by bitumen emulsion should be above 10⁰C.

Clause 502.4 Construction

Clause 502.4.1 Equipment

Replace the clause as follows

All equipment required for execution of priming work shall be in good working condition at site. The primer distributor shall be a self propelled or towed bitumen pressure sprayer equipped for spraying the material uniformly at specified rates and temperature. Hand spraying of small areas using pressure hand sprayer may be permitted at specific strategic locations, where distributor is not accessible or if narrow strips of granular surface are to be primed. Pouring of Primer using perforated can should not be permitted. SS-1 grade bitumen emulsion



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stored at site in the tank shall have arrangement like circulation pump to ensure its proper mixing before withdrawal from tank and transfer to browser.

Clause 502.4.2 Preparation of road surface

Replace the clause as follows

The base course surface to be primed shall be swept clean and made free from dust. All loose material and other foreign material on the surface shall be removed completely. Power brooms or mechanical sweepers may be used for cleaning of surface. The surface to be primed (whether with SS-1 emulsion or cutback bitumen) should be kept dry. If Soil /Moorum binder has been used in the WBM surface, part of this should be brushed and removed up to a depth of 2mm so as to provide good bond.

The dilution of SS-1 bitumen emulsion is not permitted.

Clause 502.4.3 Application of Primer

Replace the clause as follows

After the base to be primed has been prepared as in section 502.4.2, the primer shall be uniformly applied using the appropriate equipment at application rate. The spraying should preferably be carried out using pressure sprayer or distributor. The quantity of primer shall be checked periodically using tray coating test. The method of application of primer will also depend on the type of equipment to be used, size of nozzles, pressure at spray bar and speed of the forward movement of vehicle. A trial section shall be laid to check the efficacy of equipment and penetration depth of the primer.

Temperature of Application of primer :

No heating of SS-1 Bitumen Emulsion is permitted at site.

In case of cutback bitumen, temperature of application of primer should be high enough to permit the prime to be sprayed effectively through the jets of the spray bar and to cover the base course surface effectively. The temperature of product at the time of application should be more than 10⁰C.

Clause 502.4.4 Curing of Primer and opening for traffic

Replace the clause as follows

The primed surface shall be allowed to cure for at least 24 hours or such other period as is found to be necessary to allow all the volatiles to evaporate before any subsequent surface treatment or mix is laid. Excessive and unabsorbed primer if any shall be blotted with an application of sand using the minimum quantity possible. A primed surface shall not be opened for traffic other than that necessary to lay the next bituminous course.




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Clause 503 Tack Coat

Clause 503.1 Scope

Replace the clause as follows

The work shall consist of a very light application of liquid bituminous material to an existing bituminous, cement concrete or primed granular surface to ensure a bond between the surface being paved and the overlaying course. The tack coat material is not expected to penetrate into pavement and for this reason; the applications should be very light to provide adequate bond strength between two layers.

Clause 503.2 Materials

Replace the clause as follows

The binder used for tack coat shall be Cationic Bitumen Emulsion RS-1 confirming to IS 8887.

Clause 503.3 Weather and Seasonal Limitations

Replace the clause as follows

Bituminous material shall not be applied during a dust storm or when the weather is foggy, rainy or windy or when the ambient temperature is less than 10°C.

The surface should be totally dry. However, when using bitumen emulsion as tack coat, the surface should be slightly damp, but not wet.

Clause 503.4. Construction

Clause 503.4.3. Application of Tack Coat

Add the following after the end of para:

Heating and dilution of RS-1 Bitumen Emulsion is not permitted.

The quantity of bitumen emulsion to be applied over primer treated WMM surfaces shall be 0.25-.35 Kg/m².

Clause 503.4.4 Curing the tack coat

Replace the clause as follows

After application of the Emulsion as tack coat, allow the bitumen emulsion to break i.e. turn black before placing the bituminous mixture or overlay. Traffic should be kept off of the area where tack coat is being sprayed. No Plant or vehicles shall be allowed on the tack coat other than those essential for construction.




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Clause 503.8

Rate

Replace 0.2 kg /m². with 0.30 kg/m² in fourth line.

Clause 507.3.4

Add the following line at the end of the clause.

The mix shall be produced only in a batch type hot mix plant of required capacity. In no case materials from drum type hot mix plants shall be entertained. Clause 509.1

Add the following after 2nd line of this para.

Where modified bitumen is specified to be used as a binder shall have a softening point not less than 60⁰ C & specification as prescribed in IRC SP 2002 Cl.7 for CRMB or PMB as approved by the Engineer. "Modified bitumen shall be product from the refinery".

Clause 509.2.5

In **Table 500.18**, for grading 2 ,for 13mm nominal size aggregate, the cumulative % by weight of total aggregate passing against 13.2 sieve will be 90-100 instead of 79-100 .

Clause 509.3

Mixture Design

Clause 509.3.1

The requirements set out in table **500-19** will be replaced by table **500-11(A) & 500-11(B)**.

SECTION 600 CONCRETE PAVEMENTS

Clause 601

Dry Lean Cement Concrete sub-base

Clause 601.1

Scope

Clause 601.1.1

The para will be replaced as follows:

The work shall consist of construction of dry lean concrete sub base for cement concrete pavement in accordance with the requirements of these Specifications as well as of IRC:15 and in conformity with the lines, grades and cross-sections shown on the drawings or as directed by the Engineer. The work shall include furnishing of all plant and equipment, materials and labour and performing all operations, in connection with the work, as approved by the Engineer.

Clause 601.5.

Construction

Clause 601.5.2

Batching and Mixing

Add as new sub-clause

Clause 601.5.2.1

Semi-Mechanised and Labour-Oriented Construction Technique




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Clause 601.5.2.1.1 General

Use of very sophisticated paving machines and high capacity concrete batch mixer is not possible in small concrete road projects and also in remote hilly terrains. But with the use of such machineries and plants the end product is always of better quality. Without these advanced equipments concrete roads can be constructed using semi-mechanized and labour-intensive constructions but the resulting quality and surface may not be the same as achieved with mechanized constructions.

Clause 601.5.2.1.2: Forms:

The fixed-forms made of steel channels or fabricated steel sections are generally made use of.

Clause 601.5.3.1 Semi-mechanized method of construction:

Clause 601.5.3.1.1 Hauling of mix (New Clause)

Transporting of concrete mix from mixer to paving site with steel pans should be avoided. The mix tends to get segregated during such handling. It is desirable to use wheel-barrows or trolleys for carrying mix to the paving site. The workability of the mix can be controlled better with the use of wheel-barrows.

Clause 601.5.3.1.2. Plants, equipments and tools:

The plants and equipments considered essential even in semi-mechanized and labour-oriented constructions are:

A couple of tilting type drums mixers of at least 0.2 cum capacity. The number of mixers to be employed in a project shall be decided on the basis of the size of the project. Vibratory or smooth wheeled roller of 8-10t capacity Fixed side forms measuring at least 100-150 m length. Stop-end and start-end made of steel or wooden sections.

Clause 602. CEMENT CONCRETE PAVEMENT

Clause 602.2.4.3

Add as last paragraph

Although IS:383 permits the fines passing 75 microns up to 15 per cent, this provision should be used only when crushed stone dust is used as fine aggregate and when the mix produced in the Laboratory and the field is satisfactory in all respects and complies with the requirement of Specification.

Clause 602.2.6

Mild Steel Bars for dowels and tie bars

Add to the end of paragraph

“The steel shall be coated with epoxy paint for protection against corrosion.”




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Clause 602.2.8.

Joint sealing Compound:

Add at the end of para as follows

and IS: 11433.(Refer Appendix –C of IRC:15 for specifications of sealing compound)

Clause 602.3.4

Workability

Clause 602.3.4.2

Add after fourth sentence of the clause

The slump of concrete mix for pavements compacted in manual construction using needle vibrators for compaction, the slump shall not be more than 40 mm.

Add as last paragraph

In case the concrete is to be carried for long distances, liquid plasticiser shall be used having slight retardation effect. The plasticisers conforming to IS: 9103- 1999 are generally desirable for road works. The quantity of admixtures shall be determined by trials.

Clause 602.4

Sub-base

Replace the 602.4 clause as follows

Clause 602.4.1

Sub-base provided under the concrete slabs shall be of two layers consisting of upper sub-base of dry Lean Concrete as specified under clause 601 and lower sub-base as specified under clause 401 constructed in accordance with the respective specification and the surface finished to the required lines, levels and cross-section. The Concrete pavement shall mostly be undertaken in urban area and if the sub-grade in the widening portion consists of heavy clay (L.L.>50 and/or DFS >50), such as, black cotton soil, the sub-base should be laid over a 22.5 cm thick blanket course consisting of local sand. The sub-base or blanket course, as the case may be, shall be laid over a properly compacted sub-grade to give uniform support. The blanket course of sand shall not be provided at the edges but should be replaced with suitable filter of graded granular material.

Clause 602.4.2

The sub-base shall be in a moist condition at the time the concrete is placed. There shall, however, be no pools of water or soft patches formed on the sub-base surface. In case where a sand layer is placed between the sub-base and pavement concrete, a layer of water-proof paper shall be laid over the sand layer. No moistening of the sub-base shall be done in this case.

Clause 602.4.3

If the sub-base is found damaged at some places or it has cracks wider than 10 mm, it shall be repaired with fine cement concrete or bituminous concrete before laying separation layer. Prior to laying of concrete it shall be ensured that the separation membrane as per Clause 602.5 is placed in position and the same is clean of dirt or other extraneous materials and free from any damage.




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Clause 602.5 Separation Membrane

Add after the first line:

It shall be white in colour and transparent.

Clause 602.6.4. Longitudinal Joints

Clause 602.6.4.1 Add to the clause no 602.6.4.1 in end of the clause

These joints known as warping joints shall be:
Plain butt type and shall be formed by placing the concrete against the face of the slab concreted earlier. The face of the slab concreted earlier, shall be painted with bitumen before placing of fresh concrete.

Formed by a joint cutting machine when a pavement width of more than one lane is laid and to relieve warping stresses when the pavement width exceeds 4.5 m.

Add as new sub-clause

Clause 602.6.4.3. Longitudinal joint with shoulder:

This is one of the critical areas which are generally not given proper treatment. The joint widens after the concrete slabs have shrunk and this wide joint allows water to seep to the lower layers. Whether the shoulder is rigid or flexible type, the joint should be treated with sealant after widening.

Clause 602.6.4.4. Transition slabs:

At the interface of rigid and flexible pavement, at least 3 m long reinforced buried slab should be provided to give a long lasting joint at the interface. The details are shown in Fig. 3 of IRC 15: 2002.

Clause 602.6.5 Dowel bars:

Clause 602.6.5.1 Add after first sentence of the clause

Epoxy coating shall treat these or any approved anti-corrosion treatment.

Clause 602.6.5.5 The first two sentences shall read as follows

“Dowel bars shall be covered by a thin plastic sheath for at least 60 per cent of the length from one end for dowel bars in contraction. The sheath shall be tough, durable and of an average thickness not greater than 0.5 mm and shall have closed end. The sheathed bar shall comply with the following pull out test.”

Clause 602.8. Side Forms, Rails and Guide wires:

Clause 602.8.1 Replace the first three sentence of the clause as follows:




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All side forms shall be of mild steel of depth equal to the thickness of pavement minus the level tolerance stipulated for the lower layer. The forms can be placed on a series of steel packing plates or shims to take care of irregularity of sub-base. They shall be sufficiently robust with a minimum thickness of 6 mm and rigid to support the weight and pressure exerted by the paving equipment.

Clause 602.9. Construction

Clause 602.9.1: General

Replace the clause as follows

“A systems approach may be adopted for construction of the pavement, and the Method Statement for carrying out the work, detailing all the activities including indication of time-cycle, equipment, personnel, etc. These shall be got approved from the Engineer before the commencement of the work. The above shall include the type, capacity and make of the batching and mixing plant/ Concrete mixer with integrated weighing mechanism/portable mixing plant besides the hauling arrangement and paving equipment. The capacity of crusher, batching plant the cement storage, silos and the paver shall be matching so that the rate of paving shall not be less than 60 metre per hour and paving can progress without any stoppage. During planning stage, it should be noted that constructing multilane pavement is better than constructing single lane at a time from the point of view of riding quality. Therefore, the capacity of plants should be planned accordingly. “

Add as new clause

Clause 602.9.1.1 Existing Pavement

When concrete pavement is to be laid over an existing bituminous pavement which is known as white-topping, it shall be ensured that the existing road extends over the required width and has a minimum thickness of 150 mm. Where the general unevenness of the surface varies within 25 %, it can be provided with an overlay of dense bituminous macadam (DBM) with the help of a paver operating with electronic sensor to achieve the desired level, grade and alignment. The thickness of DBM shall be decided on basis of undulations present on the existing road. Where the width of the existing pavement falls short of the width to be concreted and the condition of the surface is sound enough for receiving the paving concrete, the extra width may be made up by placing at least 150 mm depth of lean cement concrete or lime-puzzolana concrete or lime-fly ash concrete or lean cement concrete as per clause 6.2.1(c) in trenches of required width at the sides of the existing metalling after taking care to see that the bottom of such trenches is well compacted with 100 mm WBM or WMM layer. The soil below shall be watered and well compacted before placing WBM/WMM material by suitable tampers before placing of the new sub-base material. The correction to the unevenness of the surface and for camber shall follow the same lines as in the preceding paragraph.


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Clause 602.9.1.2

Work on Gradients

The progress on gradient of all operations of placing, compacting and finishing of concrete should proceed from the lower to the higher reaches. The concrete mix shall be stiffer than that used on level reaches. Therefore, slump of concrete mix in such gradients should be adjusted from field trials.

Clause 602.9.9.

Curing of Concrete

Clause 602.9.9.1

Replace the first paragraph as follows

Immediately after the surface texturing, the surface and sides of the slab shall be cured by the application of approved resin-based aluminised reflective curing compound or white pigmented curing compound which hardens into an impervious film or membrane with the help of a mechanical sprayer.

Curing can be done by one of the following two methods:

By application of curing compound followed by spreading of wet hessian and moistening it regularly. In case of arid areas where water is extremely scarce, two applications of curing compound without moist curing by wet hessian may be allowed at the discretion of the Engineer.

For small works, curing can be done by manual methods using wet hessian which is kept moist during curing period. Curing shall be done for a minimum period of 7 days.

The water used for curing shall also be free from all injurious chemicals, like, chlorides and sulphate and shall meet the requirements of IS:456.

Clause 602.9.9.2.

Add as last sentence of the clause

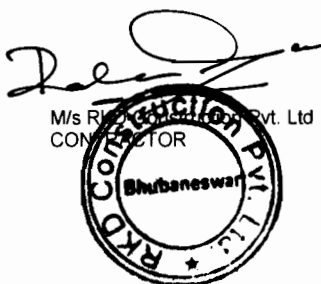
Arrangements should be made to spray the curing compound on the sides of the slab.


Add as new clause

Clause 602.9.9.5.

Curing by manual methods:

After completion of the finishing operations, the surface of the pavement shall be entirely covered with wet hessian cloth (minimum of two layers), burlap or jute mats. The coverings used shall be of such length (or width) that when laid will extend at least 500 mm beyond the edges of the slab, shall be so placed that the entire surface and both the edges of the slab are completely covered. They shall be placed as soon as the concrete has set sufficiently to prevent marring of the surface. Prior to their being placed, the coverings shall be thoroughly wetted with water and placed with the wettest side down. They shall be so weighed down as to cause them to remain in intimate contact with the surface covered. They shall be maintained fully wetted and in position for 24 hours after the concrete has been placed, or until the concrete is sufficiently hard to be walked upon without suffering any damage. To maintain the coverings wet, water shall be gently sprayed so as to avoid




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damage to the fresh concrete. If it becomes necessary to remove the coverings for cutting the joints, the concrete slab shall not be kept exposed for a period of more than half an hour. Worn coverings or coverings with holes shall not be permitted. If the covering is furnished in strips, the strips shall be laid to overlap at least 150 mm. Covering shall be placed from suitable wooden bridges (IRC: 43). Walking on freshly laid concrete to facilitate placing coverings will not be permitted. Upon the removal of the wet covering at the end of 24 hours, the slab shall be thoroughly wetted and then cured by ponding or sprinklers. Exposed edges of the slab shall be banked with a substantial berm of earth. Upon the slab shall then be laid a system of transverse and longitudinal dykes of clay about 50 mm high, covered with a blanket of sandy soil free from stones to prevent the drying up and cracking of clay. Before constructing clay dykes, the joints formed in concrete slabs shall be temporarily sealed with jute ropes, or synthetic back-up rods so that no foreign material, like, clay or sand enters the joint. The rest of the slab shall be covered with sufficient sandy soil so as to produce a blanket of earth not less than 40 mm depths after wetting. The earth covering shall be thoroughly wetted while it is being placed on the surface and against the sides of the slab and kept thoroughly saturated with water for 7 days and thoroughly wetted down during the morning of the 8th day and shall thereafter remain in place until the concrete has attained the required strength and permission is given to open the pavement to traffic. When such permission is granted, the covering shall be removed and the pavement swept clean. If the earth covering becomes displaced during the curing period, it shall be replaced to the original depth and re-saturated.

Clause 602.10. Trial Length

Clause 602.10.5.3. Density

Replace the clause as follows

"In-situ density shall be assessed as described in Clause 602.3.3 from at least 3 cores drilled when the concrete is not less than 7 days old. Should any of the cores show honey-combing in the concrete, the trial length shall be rejected and further use of the spreading and compacting unit shall not be permitted until further trials have shown that modification can be made which will result in adequate compaction"

Clause 602.10.5.5 Temperature Measurement (New Clause)

"The temperature development in the concrete slab during hardening shall be recorded. The temperature shall be measured in the middle of the slab (vertically) at a horizontal distance of at least 1000 mm from any free edge. The temperature shall be recorded every 3 hours after installment of the thermometer and the temperature-age relationship shall be determined. The maximum recorded temperature shall not exceed 70°C. If the temperature exceeds 70°C the trial length shall be condemned and the Contractor shall propose methods to reduce the temperature development and carry out a new trial length at his own expense.

Add as a new clause




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Clause 602.10.5.6.

Construction of trial sections is considered obligatory on the part of the Contractor and the entire cost of construction, dismantling and transportation of debris is to be borne by the Contractor.

Clause 602.10.6. Approval and acceptance

Add as the first sentence to the clause.

Compliance for the position and alignment of tie bars shall be checked by drilling additional cores from the slab unless they can be determined from cores taken for density.

Clause 602.11. Preparation and Sealing of Joint Grooves

Clause 602.11.2.2. Replace the last two sentences as follows

If spalling occurs or the angle of the former is greater than 10 degrees, the joint sealing groove shall be sawn wider and perpendicular to the surface to encompass the defects up to a maximum width, including any chamfer, of 25 mm for transverse joints and 15 mm for longitudinal joints. If the spalling cannot be so eliminated then the same shall be repaired by an approved thin bonded repair using cementitious materials, like, epoxy or polymer concrete.

Clause 602.11.3.3. Add to the last of the paragraph

The groove configuration is different for polysulphide and silicone. Silicone, a single chemical formula, hardens by absorbing moisture from the air and hence it should be placed in a thinner layer vis-a-vis polysulphide. Accordingly, the depth width ratio of grooves should be modified. Besides the curing time of silicone is more than that of polysulphide.

Clause 602.13. Opening to Traffic

**Clause 602.13 Replace the clause as follows
Opening to Traffic**

Replace the entire Clause with:

“In general, traffic shall be excluded from the newly constructed pavement for a period of 28 days where Ordinary Portland Cement, Portland Blast Furnace Slag Cement and Portland Pozzolana Cement are used or for a period of 7 days where Rapid Hardening Cement is used. In all cases, before the pavement is opened to traffic it shall be cleaned and the joints shall be sealed as per Clause 602.11. No vehicular traffic (including the Contractor's vehicles) shall be allowed on the finished surface until a field flexural strength of minimum 4.0 MPa has been achieved. It is the responsibility of the Contractor to produce a sufficient number of series of test specimens to verify the field flexural strength. Each series of test specimens for



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measurement of field flexural strength shall consist of minimum 3 test specimens. The specimen shall be cured at conditions similar to the field conditions. The method for curing and storing of the test specimen in order to imitate field conditions shall be proposed by the Contractor and approved by the Engineer. The required minimum field flexural strength of 4.5 MPa is achieved when the average flexural strength of minimum 3 specimens exceeds $4.0 + 1.65 s$ where s is the standard of the group."

SECTION 800 TRAFFIC SIGNS, MARKING & OTHER ROADS APPURTENANCES

Clause 801 Traffic Signs

Clause 801.1.2. This Clause shall be read as under

"All road signs shall be of retro-reflectorised type as per Type 8/9 of ASTM D 4956 a super high-intensity retro-reflective sheeting. The sheeting is typically unmetallised micro-prismatic retro-reflective element material or any other type as approved by the Engineer.

Clause 803.3.2 This Sub clause is substituted to read as under :

The road marking shall be laid with appropriate road marking machinery

Clause 803.6.6 Add as a new clause

General

Road traffic markings shall be constructed to accuracy within the tolerances given below:


- a. The width of lines and other markings shall not deviate from the specified width by more than 5%.
- b. The position of lines, letters, figures, arrows and other markings shall not deviate from the true position specified by more than 20mm.
- c. The alignment of any edge of a longitudinal line shall not deviate from the true alignment by more than 10 mm. in 15 m.
- d. The length of segments of broken longitudinal lines shall not deviate from the specified length by more than 150 mm.
- e. In broken lines, the length of segments and the gap between segments shall be as indicated on the Drawings. If these lengths are altered by the Engineer, the ratio of the lengths of the painted sections shall remain the same.
- f. Line and curves, whether broken or unbroken, shall not consist of chords but shall follow the correct radius.

Faulty Workmanship or Materials

If any material not complying with the requirements is delivered at the site or used in the Works, or if any sub-standard work is carried out, such material or work shall be removed, replaced or repaired as required by the Engineer, at the Contractor's own cost. Rejected



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traffic markings and paint that has been splashed or has dripped onto the surfacing , kerbs , structures or other such surfaces shall be removed by the Contractor at his own cost , in such a way that the markings of split paint will not show up again later.

Clause 804.3 **The first sentence of this Clause shall be read as under :**

The hectometer/kilometer stones shall be made of concrete of M20 grade.

SECTION 900 QUALITY CONTROL FOR ROAD WORKS

Clause 903 **Quality Control Tests During Construction**

Clause 903.4 **Tests on Bituminous Constructions**

In Table 900-4, Tests mentioned at serial No.4 & 6 for Bituminous Macadam/Dense Bituminous Macadam/Semi Dense Bituminous Concrete and for Bituminous Concrete, **add the following at the end** in the frequency column:

"10% of the density tests shall be done within 300mm width from edges."

Add new sub clause as 903.4.3 as follows

Clause 903.4.3

Bituminous mix shall be spread with paver fitted with electronic sensing device and string line arrangement (supported by steel pegs @ 5 m apart) on either side of paving width for automatic levelling, surface evenness and profile control. Use of string line is compulsory to provide signal to the electronic sensing device fitted with the Paver Finisher.

Bituminous works shall be tested immediately after finishing for:

- a) Thickness (compacted) measured by extracting cores shall be dealt in accordance with MORTH Specification Section 900.
- b) Density (compaction) test as performed on the extracted cores
- c) Workmanship test by measuring roughness of the finished layer by duly calibrated Towed Fifth Wheel Bump Integrator.

Note: Contractor shall arrange the core extraction machine at his cost and shall take cores of the executed bituminous works jointly with Engineer without any extra cost.

The result of tests shall be compared with the prescribed acceptable values. The payment of all such works executed shall be based on the test results. In case test results for parameters (b) & (c) above fall below the required values in accordance with specification, deductions as specified below here under shall apply limiting to 'Nil' payment for the executed bituminous works. Separate deductions shall be made for each attribute i.e. Density Test and Workmanship test.



b) Density (Compaction Test):

Core Density	Deduction in the payable rate
- Less upto 1% of requirement	@ 5%
-Less above 1% and upto 2% of requirement	@15%
-Less above 2% and upto 3% of requirement	@30%
-Less above 3% of requirement	@ 100%. Such works shall be rejected and NIL payment shall be made

The minimum deduction in the payable rate shall be made for 250 Sqm for each failure.

c) Workmanship Test: Roughness measured longitudinally

The finished bituminous layers shall be tested for workmanship (immediately before allowing traffic) by measuring roughness, longitudinally separately for each lane with the Calibrated Towed Fifth Wheel Bump Integrator. The measured roughness shall not exceed a value of 1500 mm/km for finished DBM and BC layers.

In case DBM is laid in two separate lifts, the roughness shall be measured on the final DBM layer. Any completed layer (DBM and BC) having roughness in excess of the value 1500 mm/km shall be paid in accordance with the Deduction Formulae as specified below:

Measured Roughness	Deduction in the payable rate
- Upto 5% more than the requirement	Nil
-More than 5% and upto 30% more than the requirement	@ (10%+1% for every 1% in excess of 5% of prescribed limit)
-More than 30% more than the requirement	Works to be rejected and to be relayed.

The area for which deduction in the payable rate shall apply shall be determined by the Engineer based on analysis of results. However, regardless of any other consideration, the minimum deduction shall not be less than one lane-km (3500 m²)



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SECTION 1000 MATERIALS FOR STRUCTURES

Clause 1009 Steel For Pre-Stressing

Add (e) to the list of codes to which acceptable prestressing steel shall conform:

(e) Uncoated Stress relieved low relaxation seven ply strand for prestressed concrete - IS: 14268

Clause 1009.3 Add the following note under table 1000-3

Thermo Mechanically Treated bars (TMT bars) conforming to IS: 1786 may also be used.

Clause 1010 Water

In para (c), the permissible limit for **Chloride (Cl)** shall be read as

"500 mg/lit for Prestressed Concrete / Reinforced Cement Concrete Works."

The lines indicated with * shall be read as

"* In case of structures, for concrete works not containing embedded steel, the permissible limit of chlorides may be increased upto 1000mg/lit."

Clause 1012 Concrete Admixtures

Add the following at the end of paragraph 2 of Clauses 1012.1

Admixtures shall not impair the durability of concrete; they shall not combine with the ingredients to form harmful compounds or endanger the protection of reinforcement against corrosion.

Add the following at the end of the clause.

After selecting a few acceptable brands & types of admixture based on the manufacturer's data/technical literature. Independent acceptance tests should be carried out for the same using the approved combinations of cement / sand / aggregates intended for use in the Project. After establishing the basic acceptability using strength criteria (compression & tensile strengths) a number of trial mixes be designed using different proportion of admixtures / cement / water etc. to establish the data bank on the behaviour of the admixture for the project site conditions. A spectroscopic signature of accepted product should



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be obtained and preserved for comparison for acceptance of the production lots.

Retrials should be conducted with change in source / type of cement.

Workmanship

The dosage should be finalised on the basis of field trial and special mechanical devices should be used for dispensing the admixture in the batching / mixing plant. No addition of admixture after dosage is permitted (including addition in transit mixers).

Manufacturer's experts should be available for consultation / trouble shooting of problems associated with their product. The conditions of storage, shelf life etc. as specified by the manufacturer should be strictly observed. The manufacturer's Quality Assurance Plan during process of production should be obtained and field for reference / record.

Clause 1015 Test and Standards of Acceptance

Add following as last paragraph :

Independent testing of prestressing steel shall be carried out by the contractor for each consignment from each source in the laboratory approved by the Engineer before use. The tests shall be carried out for the properties as listed in clause 7.2.1 of BS-5896:1980. These tests are in addition to the tests carried out by the manufacturer.

SECTION 1500 FORMWORK

Clause 1502 Materials

Delete the last sentence of para one


Delete the word "or Timber" in 1st line of para 2

Clause 1503 Design of Form work

Clause 1503.2 The following shall be added to this Clause

"For distribution of load and load transfer to the ground through staging, an appropriately designed base plate must be provided which shall rest on firm sub-stratum. The loading from the form work shall be distributed to the soil or the permanent works below (e.g. pile cap) in such a manner that any total or differential settlement are within acceptable limits."




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Clause 1508 Removal of Formwork

Add the following as para 5

For prestressed units, the side forms shall be released, as early as possible and the soffit forms shall permit without restraint deformation of the members, when prestress is applied. Form supports and forms for cast in situ members shall not be removed until sufficient prestress has been applied to carry the dead load and any formwork supported by the member and anticipated construction loads.

Clause 1510 Specialised Formwork

Replace the word “plywood” by “marine plywood” in the fourth paragraph of this clause.

Clause 1513 Rate

Add the following at the end of the first para

“The unit rate shall also include all cost for preparation of erection scheme, designs of false work and formwork and their approval.”

**SECTION 1600 STEEL REINFORCEMENT
(UNTESIONED)**

Clause 1605 Placing of Reinforcement

Paragraph (c) (i) of clause 1605 shall read as follows

Cover blocks shall be made of concrete or cement mortar with the same durability and strength properties as the surrounding concrete and with the same type of constituents. In visible surfaces, the cover blocks shall be of the same colour and texture as the surrounding concrete. The contractor’s proposal for cover blocks shall be submitted to the engineer for acceptance.

Clause 1606 Bar Splices

Clause 1606.1 First sentence of Clause 1606.1 shall read as follows:

“To the extent possible, all reinforcement shall be furnished in full lengths as indicated in drawings.”

Clause 1606.2 Welding

Clause 1606.2.1 Add the following at the end of the paragraph.


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In prestressed concrete members, when welding of untensioned reinforcement is permitted by the Engineer, it shall be carried out before insertion of the prestressing tendons.

SECTION 1700 STRUCTURAL CONCRETE

Add the following new clause 1704.6

Clause 1704.6 Materials for pumped concrete:

Materials for pumped concrete shall be batched consistently and uniformly. Maximum size of aggregate shall not exceed one-third of the internal diameter of the pipe.

Grading of aggregate shall be continuous and shall have sufficient ultra fine materials (materials finer than 0.25 mm). Proportion of the aggregate passing through 0.25 mm shall be between 15 and 30% and that passing through 0.125 mm sieve shall not be less than 5% of the total volume of aggregate. Admixtures to increase workability can be added. When pumping long distances and in hot weather set retarding admixtures can be use. Fluid mixes can be pumped satisfactory after adding plasticizers and super plasticizers. Suitability of concrete shall be verified by trial mixes and by performing pumping test.

Clause 1707 Equipment

Para 1 of this Clause shall read as under

“Unless specified otherwise, equipment for production, transportation and compaction of concrete shall be as under:

- a) For production of concrete: Batching and mixing of the concrete shall be done in a concrete batching and mixing plant fully automatic of a suitable capacity. The plant shall be approved by the Engineer.”

SECTION 2000 BEARINGS

Clause 2001 Description

Add the following as paragraph 2 of this clause

Within 90 days of award of work, the Contractor shall submit detailed specifications, designs and drawings including installation drawings and maintenance manual, for the approval of the Engineer. Designs shall also include review and modifications of designs and drawings of bearing pedestals and other elements required for installation. The installation of bearings shall


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be carried out under the supervision of the manufacturer of the bearings. The Contractor shall provide a warranty for 15 years from the manufacturers and the bearings shall be repaired or replaced free of cost by the Contractor / manufacturer, if any defects are observed during this period. The Employers decision regarding replacement/ repairs shall be final and binding.

Clause 2005 Elastomeric Bearings

Clause 2005.3 Acceptance Specifications

In para 5, substitute the words "Engineer or his authorized representative" for the word "Inspector".

Clause 2005.3.5 Inspection Certificate

In para 4, substitute the words "Engineer or his authorized representative" for the word "Inspector."

Clause 2009 Measurements for Payment

Add the following after para 2

"POT and POT-cum-PTFE/ Sliding bearings shall be measured in metric tons of vertical load capacity."

"Paper bearings shall be measured in square metres."

Clause 2011 Add clause 2011 after the clause 2010 as under

Paper bearing shall be reinforced bitumen laminated Kraft paper conforming to the requirements of IS- 1398.

SECTION 2200 SUB-STRUCTURE

Clause 2204 Piers and Abutments

Add the following paragraph at the end of clause

"Where necessary suitable cofferdams or other means shall be provided to exclude water from the construction area. The Contractor shall provide necessary pumping equipment for dewatering in working areas".

Clause 2210 Rate

This clause shall be read as follows

The contract rate for masonry, concrete and reinforcement in substructure shall include all works as given in respective sections and cover the cost of incidental items like providing cofferdams, dewatering, providing special formwork, where necessary, and all other items for furnishing and providing substructure as mentioned in this section."




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SECTION 2600 EXPANSION JOINTS

A new clause shall be added as 2611 as follows:

Clause 2611 Asphaltic Plug Joint

Asphaltic plug joint shall consist of a polymer modified bitumen binder, carefully selected single size aggregate, closure/bridging metallic plate and heat resistant foam caulking/ backer rod. The specifications for general requirement, material, handling & storage, installation, tests and standards of acceptance etc. shall be as per IRC-SP:69-2005.

SECTION 2800 REPAIR OF STRUCTURE

Clause 2804 Epoxy Mortar for Replacement of Spalled Concrete

Add the following in Clause 2804.4 at the end as (c)

(c) If reinforcement is exposed the same shall also be cleaned thoroughly. Sand blasting shall be done to clean the rusting on reinforcement. The reinforcement shall be coated with PMC slurry or epoxy phenolic based / epoxy based protective coating within one hour of cleaning to prevent rusting. The PMC or epoxy based protective coating shall be brush applied on the cleaned reinforcement ensuring that full surface area is covered in accordance with the manufacturers recommendation

Clause 2809 Dismantling of Concrete Wearing Coat


Clause 2809.2 This Clause shall read as follows:

The removal operations shall be carried out mechanically using pavement breakers and compressors. Removal shall be done carefully to avoid damage to any part of the existing structure. In delicate locations for example around spouts, removal shall be done by manual methods. After removal, the concrete deck surface shall be closely inspected for identifying any distress such as cracks, pockets of loose or honeycombed concrete etc. the deck surface shall be thoroughly cleaned with special efforts to remove any loose material. Expansion joints and spouts shall be removed carefully so that deck concrete is not damaged.

Clause 2809.3 Add the following at the end of Para

Dismantled material shall not be stacked on the deck nor shall it be thrown below the bridge. It shall be neatly piled at points designated by the Engineer


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with all lifts and lead up to 5000m. Materials, which can be used or auctioned, shall be stored in neat piles at locations designated by Engineer with all lifts and lead up to 2000m.

FOLLOWING NEW CLAUSES SHALL BE ADDED

Clause 2814 Dismantling of damaged and existing structures

The dismantling of various components of structure like railing, kerbs, footpath, approach slab, wing walls, piers, abutments, parapet, deck slab etc. shall be carried out as specified in drawings and as per directions of Engineer. The work shall be executed in accordance with MORTH specifications section 200, clause 202.

Clause 2815 Dowel bars

Dowel bars in deck slab at locations of parapet and expansion joint and grouting with epoxy resin locations shall be provided as shown in the drawings.

Holes shall be drilled vertically using rotary drill machines. Care shall be taken that the holes are drilled vertical and the deck concrete is not damaged. It shall be ensured that buried reinforcement of the deck is not damaged due to drilling by avoiding locations above reinforcement. Rebar detector shall be used for this purpose. 16 mm dia. dowel bars shall be inserted in the hole and kept in undisturbed position with appropriate fixture. The annular space shall be filled by epoxy grouting.

Work of epoxy grouting shall be done in accordance with MORTH Specifications Section 2800 clause 2803. It shall be ensured that the inside of the hole is dry.

Epoxy resin shall be of following specifications:

Compressive strength	- min 35 MPa at 24 hours.
Tensile strength	- 15 - 20 MPa at 7days.
Flexural strength	- 30-40 MPa at 7 days
Viscosity @ 250C	- 900-1200 cps

Clause 2816 Railing / Parapets

Cast-in-situ railing/ parapets shall be constructed in accordance with the requirements of structural concrete section 1700. The reinforcement shall conform to section 1600. The formwork shall conform to section 1500. The work in general shall conform to section 2700 clause 2703.

The reinforcement of the railings/ parapets shall be welded with the existing reinforcement of the deck slab and with the dowel bars as shown in the drawings or as directed by the Engineer.



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Clause 2817

Expansion Joint

The old expansion joint assemblies shall be removed carefully along the entire width of the carriageway as per MORTH Clause 2809.1 and recess of size shall be prepared as specified in drawing. The requirements of new expansion joint shall conform to MORTH specifications section 2600.

Clause 2818

Drainage Spout

For existing bridge decks drainage spouts shall be replaced and new drainage spouts shall be provided as shown in the drawings.

The waterproofing material shall be provided around the area of drainage spout from the top of the deck.

The work shall be executed in accordance with MORTH Specifications Section 2700 clause 2705 except to the extent modified below.

The work shall be done after the wearing coat is removed. The existing spouts shall be removed carefully with minimum damage to surrounding concrete. The pocket formed shall be sufficiently large to ensure good flow and compaction of concrete around the new spout. The area around the spout covering the pocket of new concrete adequately, approximately 500 mm x 500 mm shall be provided with a 5 mm thick polymer modified cementitious (PMC) brush topping layer.

Before commencing application of PMC brush topping the prepared concrete substrata shall be thoroughly soaked with clean water. The surface shall then be primed with PMC slurry. Before priming it should be ensured that any free surface water is removed. PMC mortar shall be applied before priming agent sets. The material shall be applied in accordance with manufacturer's recommendations.

The specifications for polymer modified cementitious (PMC) brush topping and polymer modified cementitious (PMC) mortar shall be as per clause 2822.

Clause 2819

Approach Slab

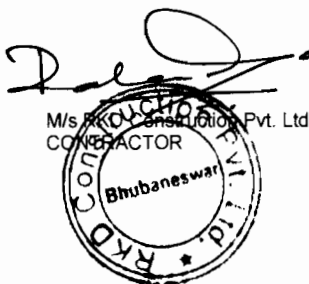
Approach slabs, which are cracked or otherwise damaged, shall be recasted after dismantling of the existing slab as specified in drawing.


The work shall be executed in accordance with MORTH specifications section 2700 clause 2704. The approach slab shall be laid over lean concrete as per drawing after compacting the base properly.

Clause 2820

Repair of Exposed Surface of Masonry Work

Exposed masonry surface of existing wing walls / returns, abutments, piers etc. shall be provided with 20mm thick plaster in 1:3 cement mortar as




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specified in drawings or as directed by Engineer. The work shall be executed in accordance with MORTH specifications of section 1300/1400.

Clause 2821 Gabion Walls

The Gabion walls shall be provided at locations as specified in drawing or as per direction of Engineer as slope protection / floor protection measures. The work shall be executed in accordance with MORTH Specifications Section 2500 clause 2503. Excavation and back filling shall be done in accordance with MORTH Specifications Section 300.

Clause 2822 Polymer Modified Cementitious Brush Topping

The polymer latex, which is to be used, should consist of water based acrylic polymer and copolymer dispersion and special purpose chemicals. The polymer solid contents shall be 30 ± 1 percent. The particle shall be of nearly spherical shape with a diameter of 0.35 ± 0.05 micrometer. The manufacturer shall certify the above requirements about solid content and grain size. In order to keep control over the quality, the manufacturer shall provide infra red absorption spectrum analysis for the materials (polymer latex) to be supplied by them.

Portland Cement conforming to IS:8112 shall be used for production of polymer modified cement repair mortar and polymer modified cementitious coating system, which is to be used as a bonding medium concrete substrata.

Acrylic polymer latex shall be used as the polymer for modifying and improving the properties of cement. The same product is to be used for various purposes such as in a slurry form with cement to form a bonding /priming medium and with sand to form PMC repair mortar. However, no additional water is to be added to PMC slurry or PMC repair mortar as the water which is present in the latex is sufficient for cement hydration and for this reason the latex cement ratio remain constant for all applications.

The sand which is to be used for constituting the PMC repair mortar should be Silica sand as the basic material which is categorized in two groups:

- a) Coarse Silica sand
- b) Fine Silica

The gradings of the above groups should follow the limits provided below.

Polymer Modified Cementitious (PMC) Mortar

The specifications for polymer modified cementitious material (PMC) shall be read as under


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I. Mix Formulations

PMC SLURRY

COMPONENT	PARTS BY WEIGHT
Cement	100
Acrylic polymer latex	52

PMC REPAIR MORTAR

COMPONENT	PARTS BY WEIGHT
Cement	100
Acrylic polymer latex	52
Coarse Silica Sand	150
Fine Silica Sand	150

Curing of PMC WORK

This specification describes the curing procedures to be followed for PMC Repair Mortar & Slurry

The curing procedures outlined apply to normal weather conditions. Under hot weather conditions take precautions to avoid drying. PMC work should be carried out at a temperature below 35°C

Under unusual weather conditions e.g. high humidity and / or high wind velocity or imposed constraints special curing procedures shall be followed for which approval shall be obtained from the Engineer.

Air-drying shall be considered to be taken place only during favourable uninterrupted weather conditions existing throughout the existing recommended drying period. Some judgement shall be made in this respect and if conditions are deemed unfavourable for drying to occur, then drying must be prolonged for the full-recommended period after weather clears.

As PMC work proceeds, precautions shall be taken to prevent rapid drying of the PMC repair mortar. This is usually accomplished by covering the filled surfaces with an impermeable sheet shortly after the work has been done.

The sheet shall be kept in place until further work is carried out over the mortar or in case where the mortar is likely to be disturbed the sheet shall be kept in place for 24 hours.

No foot traffic for further work shall be allowed over mortar until 12 hours from the time of the completion of work.

Curing compound may also be used as curing membrane. Care shall be taken to ensure complete covering particularly around the interface with the host concrete.


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For the first day the repaired concrete patch shall be protected from harsh environment by laying a polythene sheet over it, taping down the edges.

Mixing PMC

To mix PMC, it is necessary to have the following items

- i. A suitable sized mixing container
- ii. A high speed drill with mixing paddles
- iii. Premark batching containers for measuring out components to be mixed

Pour all the liquid polymer latex into mixing container. After shaking the latex to disperse the solids uniformly throughout the liquid before use.

Begin mechanical mixing and while doing so, slowly add the dry components i.e. cement and sand.

Mix for about 5 minutes until solids have been well dispersed. The resulting mix should look uniform, feel creamy and be free from lumps and grits.

Precaution shall be taken not to entrap an excessive amount of air into the mix during mixing.

Since the desired consistency depends on type and brand of cement as well as weather conditions, start a trial mix with a reduced amount of cement. Once all components are mixed, add cement if necessary to achieve the desired consistency. Record the amount of cement required and uses this for subsequent mixes. Do not reduce the quantity of cement noted in the mix proportions.


In case the slurry sets before application of mortar, a fresh coat of slurry shall be applied. Under no circumstances water shall be added in PMC repair mortar mix. Unused mortar or mortar which has partially set shall not be re-mixed and used.

I.S. Sieve No.	Percentage Passing by Weight		
	Coarse	Fine	Combined
10 mm	100	100	100
4.75 mm	95-100	100	98-100
2.36 mm	90-100	100	80-100
1.18 mm	40-60	100	70-80
600 micron	0-10	90-100	45-55
300 micron	0-4	40-60	20-30
150 micron	0-3	0 – 10	0-5
75 micron	3max	0-3	3max

In the event of using local sand, the sand to be used must satisfy the limits of deleterious materials and the requirements of soundness as given in Cl. 3.2.1



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and Cl. 3.6 respectively of IS: 383. Confirmatory tests shall be conducted by the Contractor and sample kept for comparison by the Engineer.

II Mix Formulations

COMPONENT	PARTS BY WEIGHT
Cement	100
Acrylic polymer latex	52
Fine Silica Sand	100

Curing of PMC brush topping

This specification describes the curing procedures to be followed for various PMC systems.

The curing procedures outlined apply to normal weather conditions. Under hot weather conditions take precautions to avoid drying. PMC work should be carried out at a temperature below 35°C.

Under unusual weather conditions e.g. high humidity and/or high wind velocity or imposed constraints special curing procedures shall be followed, for which approval shall be obtained from the Engineer.

Air drying shall be considered to take place only during favourable uninterrupted weather conditions existing throughout the recommended drying period. Some judgement shall be made in this respect and if conditions are deemed unfavourable for drying to occur, then drying must be prolonged for the full-recommended period after the weather clears.

In unexposed and exposed areas the initial air drying of 4 to 6 hours shall be followed by moist curing for 24 hours by spraying or another approved curing method.

Following moist curing, the coating shall be allowed to air dry for 4 to 6 hours prior to the application of finishing coat.

Mixing PMC Slurries

To mix PMC slurries, it is necessary to have the following items:

- i) a suitable sized mixing container
- ii) A high speed drill with mixing paddles
- iii) Premark batching containers for measuring out components to be mixed.

Pour all the liquid polymer latex into the mixing container. Shake the latex to disperse the solids uniformly throughout the liquid before use.

Begin mechanical mixing and while doing so, slowly add the dry components, i.e. cement and sand for brush top coating.


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Mix for about 5 minutes until all the solids have been well dispersed. The resulting mix should look uniform, feel creamy and be free from lumps and grit.

Precaution shall be taken not to entrap an excessive amount of air into the mix during mixing.

Since the desired consistency depends on type and brand of cement as well as weather conditions, start a trial mix with a reduced amount of cement. Once all components are mixed, add cement if necessary to achieve the desired consistency. Record the amount of cement required and use this for the subsequent mixes. Do not reduce the quantity of cement noted in the mix proportions.



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PART III

TECHNICAL SPECIFICATIONS FOR BUILDING WORKS

This part shall comprise the latest “Specifications for Building Works” Volume I to Volume IV, 1995 as published by the Central Public Works Department, Govt. of India and deemed to be bound into this document.



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PART-IV

ENVIRONMENTAL MANAGEMENT PLAN

	S. No.	Environmental Issue/Aspect	Management Measures
	E.1	Tree Cutting	The Contractor shall not cut or damage trees except that are required to be felled for construction of traffic diversion works and facilities, after obtaining necessary permission for felling of the same from the authorities.
	E.2	Joint Field Verification	The Engineer and the Contractor will organize and carry out joint field verification to ascertain the possibility of saving environmental and community resources. The complaints/suggestions together with the observations and expert opinion of the joint verification team containing the need for additional protection measures or changes in design/scale/nature of protection/management measures shall be well documented with other requisite details such as date, time, place and signature of the individuals involved. Approval will be accorded by the Engineer in consultation with the Project Authority.
	E.3	Location and installation of Crushers, Hot-mix Plants and Batching Plants	All plants (hot-mix, crushers, batching plant, WMM or any other) shall be located at least 1000 mts. away from habitations, forests and wildlife movement areas, preferably in the downwind direction. The Contractor shall submit the proposed location plan (including survey number/s of the land parcel/s under consideration, area, land-use and surrounding features) and seek prior approval of the Engineer before entering into any formal agreement with land owner/s for setting-up such construction facilities. The Contractor will formalize agreement with land owner/s only after a written approval has been accorded by the Engineer.
		Construction Camp/s –	The 'installation' of the plant/s shall commence after the contractor has obtained 'consent to establish' from the Orissa State Pollution Control Board. The 'operation' of the plant/s shall be permitted by the Engineer after the 'consent to operate' has been obtained from the SPCB. A copy of the application submitted to the SPCB and the consent/s received must be submitted to the Engineer, based on which the approvals will be accorded. Action/s by the Engineer against any non-compliance on this count shall be borne by the Contractor at his own risk and cost. No construction camps, including material stack yards and storage facility will not be proposed within 500 mts. From


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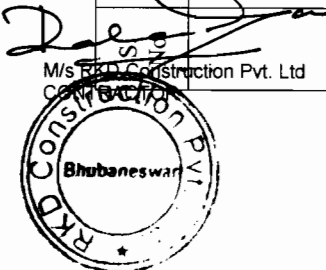


Environmental Issue/Aspect	Management Measures
<p>Selection, Design and Lay-out</p>	<p>a. a settlement/habitation b. water source and c. reserved or protected forest limits to avoid conflicts and stress on the local infrastructure facilities and natural resources. In case the contractor proposes setting-up of plant/s within a construction camp, clause P.3 will apply. The Contractor shall submit the proposed location plan (including survey number/s of the land parcel/s under consideration, area, land-use and surrounding features) and seek prior approval of the Engineer before entering into any formal agreement with land owner/s for setting-up construction camps. The Contractor will formalize agreement with land owner/s only after a written approval has been accorded by the Engineer. Complete details about the pre-dominant wind direction and design of facilities, including circulation area, parking, material storage, kitchen/mess, sanitation, waste collection and disposal, drainage, electrical utility placement and water supply shall be provided by the Contractor as part of the documentation seeking approval of the Engineer on this count.</p>
<p>E.5 Construction Vehicles, Equipment and Machinery</p>	<p>All vehicles, equipment and machinery to be procured for construction shall confirm to the relevant Bureau of India Standard (BIS) norms. The Contractor shall ensure that all vehicles, equipment and machinery used for construction are regularly maintained and confirm to the emission standards specified by the CPCB. Certification issued for such contrivances by the designated/approved authorities shall be submitted to the Engineer. The Contractor shall maintain a proper record of Pollution Under Control Certificates for all vehicles and machinery used for works under the contract. Copies of such records shall be kept at the site office and shall be made available to the Engineer when sought.</p>
<p>E.6 Identification, Operation and Rehabilitation of Burrow Areas</p>	<p>The Contractor shall submit the proposed location plan (including site details, survey number/s of the land parcel/s under consideration, area and quantum of material proposed for extraction, land-use and surrounding features) and seek prior approval of the Engineer before entering into any formal agreement with land owner/s for opening burrow areas. The Contractor will formalize agreement with land owner/s only after a written approval has been accorded by the Engineer. The Engineer will be required to inspect every proposed burrow area location and evaluate (parallel with</p>

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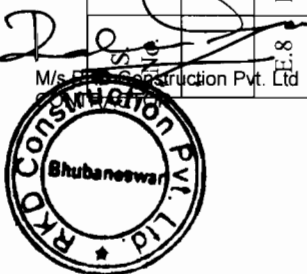


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Environmental Issue/Aspect	Management Measures
	<p>technical examination) such proposals in accordance to environmental requirements as laid down in the EMP prior to issuing the 'approval' for use of such sites.</p> <p>No burrow areas shall be opened within 500 mts. from wildlife movement zones and forest areas. The burrow areas shall be at least 250 mts. from schools, human habitations (residential and commercial establishments), village access roads, state highways and other roads.</p> <p>No burrow area will be opened/operated without the written permission of the Engineer. The location, shape and size of the designated burrow areas will be as approved by the Engineer and in accordance to the IRC recommended practice for burrow pits for road embankments (IRC 10: 1961). The 'format' for seeking Engineer's approval on environmental considerations will be as per the template provided in this EMP and will include a reference/location map; area, existing land use and haul road details; photograph of the site; and the proposed rehabilitation plan. The Contractor will not start burrowing earth from the approved burrow area/s until an agreement is signed between land owner/s and Contractor and a copy of this agreement is submitted to the Engineer.</p> <p>In burrow pits, the depth shall be regulated so that the sides of the excavation should not be steeper than 1:2, from the edge.</p> <p>All burrow areas whether in private, community or govt. land shall be restored as per the approved rehabilitation plan immediately after completion of the use of such a source. The Contractor shall plan and ensure rehabilitation work in such a manner that it is completed prior to the rainy season. 'Substantial completion' or 'completion' certificates for the civil work shall not be issued unless restoration and rehabilitation works have been completed by the Contractor and the same has been accorded a written approval by the Engineer.</p>
<p>E.7 Identification, Operation and Rehabilitation of Stone Quarry</p>	<p>The Contractor shall submit the proposed location plan (including site details, survey number/s of the land parcel/s under consideration, area and quantum of material proposed to be used, land-use, photograph/s of the site and surrounding features within 500 mts.) and seek prior approval of the Engineer before entering into any formal agreement with land owner/s in case of a new quarry site or with the owner/operator in case use of an existing quarry is proposed.</p> <p>No quarry and/or crusher units shall be 'selected' or 'used', which is within 1000 mts. from a human habitation, forest boundary and wildlife habitats/movement areas.</p> <p>The Contractor shall obtain necessary legal permission/s from Department of Mines, Govt. of Orissa and the</p>

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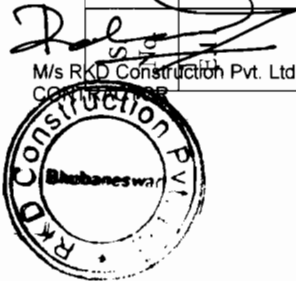
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Environmental Issue/Aspect	Management Measures
<p>Identification, and Operation of Sand Quarry</p>	<p>The Contractor shall submit the proposed location plan (including details of the site/s under consideration, proposed quantum of material extraction and surrounding features) and seek prior approval of the Engineer. No sand quarry shall be opened within 500 mts. from wildlife movement zones and forest areas.</p> <p>In the event of selection of a new site for sand quarrying, the Contractor shall obtain prior approval and concurrence from Competent District Authority, the local Tehsildar and the Engineer keeping in view the objections and convenience of the local population. Where the supplier of sand is another party, the authentic copy of lease agreement that has been executed between the local Tehsildar and the supplier has to be submitted to the Engineer before any procurement of material is made from such a site. The procurement of material shall be allowed only from those sand quarry sites that are permitted by the local Tehsildar with the concurrence of the District Collector with due regard to Orissa Miner Mineral Concession Rules, 2004.</p>
<p>E.9 Arrangement for Construction Water</p>	<p>The Contractor shall submit the proposed location plan (including site details; type of the source under consideration; its usage by other consumers; proposed quantum of water extraction) and seek prior approval of the Engineer. To avoid disruption/disturbance to other water users, the Contractor will extract water only from the approved locations and shall seek a written approval of the Engineer before finalizing and using any such water source – whether ground or at surface.</p> <p>Use of ground water facility shall be subject to the local legislation; ground water availability in the area and the granting of necessary permission by the Competent Authority. The Contractor shall pay the royalty for use of such water as decided under the relevant norms. A copy of the permission obtained from the Competent Authority shall be submitted to the Engineer prior to the use of any such source. The possibility/ permission for sinking of bore wells adjacent to nalas and streams may be examined, such that while the water requirement for the road construction activity is met and these structures when abandoned can help in ground water recharge after suitable modification.</p>
<p>E.10 Clearing and Grubbing</p>	<p>All works shall be carried out by the Contractor in a manner such that the damage or disruption to flora is minimal. Only ground cover/shrubs that impinge directly on the permanent works or necessary temporary works will be removed with prior approval from Engineer.</p>

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Environmental Issue/Aspect	Management Measures
Stripping, stacking and preservation of top soil	<p>The top soil from all sites including road side widening and working area, cutting areas, quarry sites, burrows areas, construction camps, haul roads in agricultural fields (if any) and areas to be permanently covered shall be stripped to a specified depth of 150mm and stored in stockpiles for re-use. A portion of the temporarily acquired area (along the boundaries in a construction camp, burrow areas etc.) and along the road at the Right of Way edge will be earmarked for storing top soil. The locations for stacking will be pre-identified in consultation and with approval of the Engineer.</p> <p>The following precautionary measures will be taken by the Contractor to preserve the stockpiles till they are re-used:</p> <ul style="list-style-type: none"> (a) Stockpile will be such that the slope does not exceed 1:2 (vertical to horizontal), and height is restricted to 2 m. (b) To retain soil and to allow percolation of water, the edges of the pile will be protected by silt fence. (c) Multiple handling kept to a minimum to ensure that no compaction occurs. (d) Such stockpiles shall be covered with empty gunny bags or will be planted with grasses to prevent loss during rains. <p>Such stockpiled topsoil will be utilized for -</p> <ul style="list-style-type: none"> ➤ Covering reclamation sites or other disturbed areas including burrow areas (other than those in barren areas) ➤ Top dressing of road embankment and fill slopes ➤ Filling up of tree pits and ➤ In the agricultural fields of farmers, acquired temporarily that need to be restored. <p>Residual topsoil, if there is any, will be utilized for the plantation works along the road corridor.</p> <p>The utilization as far as possible shall be in the same area/close to the same area from where the top soil was removed. The stripping, preservation and reuse shall be closely supervised and properly recorded by the Engineer.</p>
2.1 Accommodation	<p>Labour Camp Management</p> <p>Prior to setting-up such a labour/worker's facility, the location, lay-out and basic provision of facilities to be provided at each labour camp site shall be submitted to the Engineer for approval. The construction or hiring of such facilities shall commence</p>

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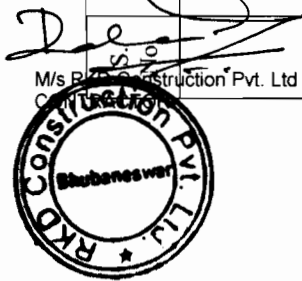


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
Environmental Issue/Aspect	Management Measures
1.2.2 Potable Water	<p>only after the written approval from the Engineer has been received by the Contractor.</p> <p>The Contractor shall ensure the fulfillment of the following conditions:</p> <ul style="list-style-type: none"> a) Supply of sufficient quantity of potable water within the precincts of every workplace in a cool and shaded area. Such facilities shall be regularly maintained from health and hygiene point of view. b) All open wells will be entirely covered and will be provided with a trap door to prevent accidental fall and contamination from dust, litter etc. A reliable pump will be fitted to each covered well. <p>The Engineer is required to inspect the labour camp once in a week to ensure compliance to the health and hygienic standards prescribed in the Labour Regulations and in the EMP.</p>
1.2.3 Sanitation and Sewage System	<p>The Contractor shall ensure that -</p> <ul style="list-style-type: none"> c) The provision of toilets and sewage system for the camp is to be designed, built and operated in such a fashion that no health hazard occurs and no pollution to the air, surrounding agricultural fields, ground water or adjacent water courses takes place. d) Separate toilets and bathrooms for women workers wherever required, screened from those of men, are provided with markings in vernacular language. e) All such facilities must have adequate water supply with proper drainage and disposal facility. f) All toilets in workplaces are to be maintained, cleaned and disinfected daily using proper disinfectants. g) Portable toilets may be brought to use and the night soil from such units has to be disposed through designated septic tanks so as to prevent pollution of the surrounding areas. h) In the main camp, no night soil or sewerage shall be disposed of at any place other than the septic tanks constructed at the site. <p>All these facilities shall be inspected on a weekly basis by the Engineer to check the hygiene standards.</p>
E.13 Transportation of Construction Materials and Haul Road Management	<p>The Contractor shall maintain properly (as directed by the Engineer) all roads (existing or constructed for the project), used for transporting construction materials, equipment and machineries for the works under this contract. It shall be the responsibility of the Contractor to ensure that all roads used for transportation of construction materials are clear from any dust, sand, soil, aggregates etc. that may have fallen from the transporting vehicles. The Contractor will arrange for regular water sprinkling, at least three times in a day, for dust suppression of all such roads and surfaces.</p>

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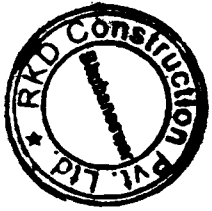
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Environmental Issue/Aspect	Management Measures
	<p>All vehicles delivering goods to the site shall be covered to avoid spillage of materials and air pollution.</p> <p>The unloading of all materials at construction sites will be limited to day time only to avoid accidents. Screens of hessian cloth, agro-net and such other barricading material are to be erected along all dumping and stockpiling sites, so that generation of the dust in the vicinity of such locations can be minimized to a great extent.</p>
E.14	Worksite Safety Management
14.1	This shall be done according to the provisions of Technical Specifications Cl. 112.
14.2	This shall be done according to the provisions of Technical Specifications Cl. 112
14.3	<p>The Contractor will make sure that during the construction work all relevant provisions of the Factories Act, 1948 and the Building and Other Construction Workers (Regulation of Employment and Conditions of Services) Act, 1996 are adhered to. The Contractor will comply with all the precautions as required for ensuring the safety of the workmen as per the International Labor Organization (ILO) Convention No. 62 as far as those are applicable to this contract.</p> <p>The Contractor shall provide and ensure enforcement with zero tolerance on the following:</p> <ul style="list-style-type: none"> a) Protective footwear and protective goggles to all workers employed handling asphalt materials, cement, mortar, concrete, blasting and crusher operations. b) Welder's protective eye-shields and protective footwear to workers engaged in welding works. c) Earplugs to workers exposed to high noise levels. d) Hard hat or helmets to all workers, supervising staff and inspecting officials entering a construction site, plant area, quarry and engaged in loading/unloading operations. e) Protective goggles and clothing to workers engaged in stone breaking activities. f) Nettings below and on the sides of overhead construction and excavation work to prevent mishaps due to accidental fall of workmen and debris. g) 'No smoking' and other 'high risk' areas are to be provided with warning signage besides strict enforcement of PPE with zero tolerance limits.


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D. S. Saha

D. S. Saha

Environmental Issue/Aspect	Management Measures
Risk from Electrical Equipment(s)	<p>All power transmission lines whether claded or sufficiently covered are potential hazards at construction sites. The Contractor shall take all required precautions to prevent danger from electrical cables, wires and equipment and ensure that –</p> <ol style="list-style-type: none"> No material will be stacked or placed below/near power transmission lines, wires and equipment, which can be a potential danger to any road user, workman or public. All such electrical installations and wirings shall be barricaded in manner that ensures safety of the road users, workers, operating vehicles/equipment (such as cranes, excavators, loaders, fabricating units) and wildlife. Necessary fencing, illumination and proper insulation of the electrical lines shall be ensured by the contractor for safety and security of the general public, road users, workers and the wildlife. The contractor shall ensure proper maintenance of electrical supply lines/points. All such electrical operating units shall be switched off before operations are closed every day or night as the case may be. All electrical equipment/cables/wires to be used in the construction shall have to conform to the relevant BIS specifications/codes. The contractor will ensure that such equipment/cables/wires are free from patent defect, and maintained in good working order (as per the owner manual supplied by the manufacturer) through regular supervision, monitoring, maintenance and repair/ replacement from time to time.
14.5	<p>First Aid</p> <p>The Contractor shall arrange for -</p> <ul style="list-style-type: none"> A readily available life saving first aid kits including an adequate supply of sterilized dressing materials and appliances as per the Factories Rules in every work zone. Availability of suitable transport at all times to take injured or sick person(s) to the nearest hospital. Equipment and trained nursing /paramedical staff at construction camps. Periodic health checks for workers.
14.6	<p>Risk Force Majeure</p> <p>The Contractor shall take all reasonable precautions to prevent danger of destruction to life and property of the public as well as the workers on account of flood, fire, explosion, accidents involving vehicles carrying hazardous materials etc. in an around work sites, camps, maintenance units, burrow areas, quarries, haul roads and in any other place associated with the project activity.</p> <p>The Contractor will make the required arrangements so that in case of any mishap all necessary steps can be taken for prompt on-the-spot first aid treatment. Arrangements shall be made for quick rescue operation including shifting of the injured to the nearest</p>



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S. No.	Environmental Issue/Aspect	Management Measures
		<p>hospital</p> <p>Fire extinguishers/fire-fighting equipment and salvaging equipment for the recovery of hazardous chemicals on account of accidents or spillage are to be kept ready at camping sites or major construction sites to attend to such eventualities.</p> <p>A Construction Safety Plan to be prepared by the Contractor during the Mobilization phase shall identify all necessary actions in the event of an emergency. The actions shall include description of stand-by arrangements, rescue of workers/people and salvage of hazardous chemicals/ materials in case of such eventualities. This plan shall be prepared in accordance with the standard practice adopted under labour welfare activities and Factories Act and will be approved by the Engineer.</p>
E.15	Accessibility	<p>Construction activities that affect the use of side roads and existing accesses to individual properties, whether public or private, shall not be undertaken without providing adequate provision/s approved by the Engineer. The Contractor will provide safe and convenient passage for vehicles, pedestrians and livestock to and from road sides and property accesses connecting the project road by providing safe temporary arrangements, including a connecting road, as necessary.</p>
E.16	Disruption to Other Users of Water	<p>While working across or close to any perennial water bodies, the Contractor shall not obstruct/prevent the flow of water.</p> <p>Construction over and close to the non-perennial streams shall be undertaken in dry season and if such activity is likely to disrupt, constrain or impact the community use of the water body, adequate prior information (at least two weeks in advance) will be provided to such a community. Such water body may be ponds, water harvesting structures (WHS), feeder channels to pond, irrigation sources etc. If the supply of water or access to a source is being completely cut off, then the Contractor shall make necessary arrangements to provide water in the interim period. Water quality test shall be done prior to providing / supplying the water.</p>
E.17	Labour Requirements	<p>The Contractor preferably will use labour drawn from local areas to provide maximum benefit to the local community especially to the vulnerable individuals/groups living in the project area.</p>
E.18	Pollution Management	

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Environmental Issue/Aspect	Management Measures
8.2 Dust Pollution	<p>The Contractor will take every precaution to reduce the level of dust (SPM and RSPM) and make arrangements to minimize dust pollution through provision of wind screens/barriers, water sprinkling/mist spray units, and encapsulation of dust source shall be made at the plant sites.</p> <p>Specifications of crushers, hot mix plants and batching plants shall comply with the requirements of the relevant legislations and as laid out in the 'Consents' issued by the OSPCB. The Contractor will provide necessary certificates to confirm that all crushers used for the works under the Contract conform to relevant dust emission control legislation.</p> <p>Even if the Contractor chooses to use an existing crusher (already operating in the area), basic minimum standards stipulated under the Pollution Control Legislation will have to be met and dust control devices need to be installed and operated. Copies of the required certificates and 'consents' of such a plant shall be procured by the Contractor and submitted to Engineer prior to the procurement of material from a unit of this nature.</p>
18.2 Siltation of Water Bodies and Degradation of Water Quality	<p>Release of wastes (non-toxic and toxic) by the Contractor into water bodies and drainage systems that may adversely impact the aquatic life both locally and in the downstream stretches shall be viewed as serious non-compliance of EMP since these may affect the eco-flow, aquatic life and livelihoods of people dependent on such resources.</p> <p>The Contractor will ensure that construction and excavated materials containing fine particles are stored in an enclosure, particularly during the rainy season, such that sediment-laden water does not drain into nearby water bodies..</p> <p>The Contractor shall take all precautionary measures to prevent the wastewater generated during construction from entering into streams, water bodies or the irrigation system by providing proper septic tanks and soak pits. Spills, dust fines, waste oil, wastes and debris shall be cleared and disposed off as per the guidelines provided in the EMP under the supervision of the Engineer.</p> <p>The Contractor will avoid continuation of construction activity close to the streams or water bodies during monsoon. Stream courses and drains will be kept free from dumping of solid wastes, excavated earth, sludge and discharge of waste water from construction camps and sites. Liquid wastes arising from construction sites are to be impounded into proper collection pits.</p>
8.3 Water Pollution from Fuel, Lubricants and	<p>Garage, service stations, refueling stations and equipment maintenance yards shall be so located at least 100 mts. away from kitchen, mess and drinking water facilities within the camp site.</p> <p>The Contractor shall ensure that all vehicles, machinery and equipment are operated (including re-fuelling) and maintained in such</p>

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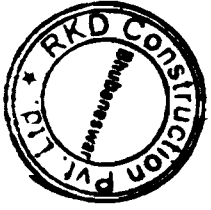
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Environmental Issue/Aspect	Management Measures
Chemicals	<p>a fashion that any spillage (while working or accidental) of fuel and lubricants does not contaminate the land and water resources. There shall be lined drains and service ramps with oil and grease traps/oil interceptors in such areas to prevent liquid wastes from entering into soil, any aquifer, local water source, bore well, pond and other water bodies. Storage of drums (both filled and empty) and refueling shall be done on concrete platforms (impervious surface). Additionally, roofing (of any type other than asbestos) shall be provided to prevent contamination of land and water due to run-off from such sites during rains. Oil interceptors are also to be provided at vehicle parking areas.</p> <p>The contractor will arrange for collection, storage, reuse/disposal of spent oil, lubricants, grease, sludge, slurry, bitumen, chemicals and paints or other such material. Covered bins/drums (marked specifically regarding the contents) shall be kept separately at maintenance and refueling areas. Disposal shall be at pre-identified sites (as listed in the Waste Management Plan) as approved by the Engineer. All spills and collected petroleum products will be disposed off in accordance with the prevailing MoEF and SPCB guidelines issued for such purpose. The Engineer will certify that all arrangements comply with the guidelines of SPCB/ MoEF.</p>
18.4 Noise Pollution	<p>The Contractor shall ensure the following:</p> <ol style="list-style-type: none"> a) All plants and equipment used in construction (including those of sub-Contractors and/or suppliers such as aggregate crushing plants) shall strictly conform to the MoEF/CPCB noise standards and shall have latest noise suppression mountings. b) All vehicles and equipment used in construction will be fitted with exhaust silencers. c) Servicing of all construction vehicles and machinery will be done regularly and during routine servicing operations, the effectiveness of exhaust silencers will be checked and if found defective, these shall be replaced. d) Maintenance of equipment, machinery and vehicles (including proper lubrication, tuning, checks for muffler effectiveness) shall be regular and up to the satisfaction of the Engineer to keep noise levels under control. e) Construction activity at sites within 100m habitations and hospitals shall not be carried out during night (10:00 pm to 06:00 am). f) Construction activity at sites within 500m from wildlife movement zones, reserved and protected forest areas shall not be carried out between 06:00 pm to 06:00 am. g) Blasting operations, if any shall be carried out with full safety precautions and in compliance with measures as specified in the legal provisions. <p>Monitoring shall be carried out by the Contractor in presence of the Engineer at the construction sites as per the Noise Monitoring Plan provided in this EMP and results shall be shared with the Engineer.</p>



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	Environmental Issue/Aspect	Management Measures
	Drainage and Flood Control	The contractor will also ensure that no material (such as earth, stone, or other construction material or wastes) blocks the natural flow of water in any water course or cross drainage channel. All cross drainage and structure construction sites shall be cleared/cleaned-up prior to the rainy season. Also, prior to the monsoon season, the Contractor will provide either permanent or temporary drains to prevent water accumulation in residential, commercial and agricultural areas adjoining the under-construction zones of the road. Besides this, drainage shall be cleared to avoid accumulation of water within the construction sites, camp and plant sites and storage yard well in advance of the rainy season.
E.20	Slope Protection and Control of Soil Erosion	<p>The Contractor will provide slope protection works as per design, or as directed by the Engineer to control soil erosion and sedimentation through use of dykes, sedimentation chambers, basins, fiber mats, mulches, grasses, slope drains and other devices as required under specific local conditions. All temporary sedimentation, pollution control works and maintenance thereof will be deemed as incidental to the earth work or other items of work and as such no separate payment will be made for them.</p> <p>The Contractor shall ensure the following:</p> <ol style="list-style-type: none"> After construction of road embankment, the side slopes of all cut and fill areas will be graded and covered with stone pitching, grass and shrub, as per design specifications. Turfing works will be taken up as soon as possible provided the season is favorable for the establishment of grass sods. Other measures of slope stabilization may include mulching/netting with sowing of grass seeds and sprinkling of water on such slopes after the completion of the earth work. Along sections abutting water bodies, stone pitching, as laid out in the design, will be provided to protect slopes.
E.21	Waste Management	
W01.1	Waste Management – Planning and Identification of Disposal Sites	The Contractor will ensure that any spoils/materials unsuitable for embankment fill are not be disposed off near any water course; water body; agricultural land; natural habitats like grass lands, wet lands, flood plains, forests and pastures. All proposed disposal sites for waste material shall be identified by the Contractor and a Rehabilitation Plan (including details about pollution prevention and safety measures) for each such site shall be submitted to the Engineer for approval.

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Environmental Issue/Aspect	Management Measures
<p>Re-use and Disposal of Debris Generated from Dismantling of Structures and Road Surface</p>	<p>Debris generated due to the dismantling of the existing road will be suitably re-used in the proposed construction as follows:</p> <ul style="list-style-type: none"> ▪ The dismantled scraps of bitumen will be disposed off through utilization for the paving of cross roads, access roads and paving works in construction sites and campus, temporary traffic diversions, haulage routes, parking areas along the corridor or in any other manner approved by the Engineer. ▪ At locations identified for disposal of residual bituminous wastes, the disposal will be carried out over a 60 mm thick layer of rammed clay so as to eliminate the possibility of leaching of wastes into the ground water. ▪ The Contractor will suitably dispose off unutilized non-toxic debris either through filling up of burrows areas located in wasteland or at pre-designated disposal sites, subject to the approval of the Engineer. ▪ Debris generated from pile driving or other construction activities along the rivers and streams drainage channels shall be carefully disposed in such a manner that it does not flow into the water body. ▪ Non-bituminous wastes may be dumped in burrow pits (preferably located in barren lands) where such burrow pits are not suitable to develop as a economic source like pisci-culture or a source of irrigation. Such burrow pits can be filled up with non-bitumen wastes and then covered with a minimum 30cm layer of the soil, where plantation of trees and shrubs can be taken-up. <p>The Contractor at his own cost shall resolve any claim, arising out of waste disposal or any non-compliance that may arise on account of lack of action on his part.</p>
<p>21.3 Waste Disposal from Construction Camp/s and Plant Site/s</p>	<p>The Contractor will provide garbage bins in the construction camp/s and ensure that these are regularly emptied and disposed off in a hygienic manner. No incineration or burning of wastes shall be carried out by the Contractor. The disposal of kitchen waste and other biodegradable matter shall be carried out in pits covered with a layer of earth within the camp site.</p> <p>Discarded plastic bags, paper and paper products, bottles, packaging material, gunny bags, hessian, metal containers, strips and scraps of metal, PVC pipes, rubber and poly urethane foam, auto mobile spares, tubes, tyres, belts, filters, waste oil, drums and other such materials shall be either reused or will be sold/given out for recycling.</p>
<p>22 Chance Found Archaeological Property</p>	<p>All fossils, coins, articles of value of antiquity, structures and other remains or things of geological or archaeological interest discovered on the site shall be the property of the Government and shall be dealt with as per provisions of the relevant legislation.</p>



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Environmental Issue/Aspect	Management Measures
<p>23 Demobilization and Decommissioning</p>	<p>The Contractor shall clear all temporary structures and dispose all garbage, night soils and POL waste as per the approved Waste Management Plan. All construction zones including river-beds, drainage channels, culverts, road-side areas, camps, hot mix plant sites, crushers, batching plant sites and any other area used/affected by the project will be rehabilitated as per the approved plans. The Engineer shall ensure that all clean-up and restoration operations are completed satisfactorily and written approval is given to the contractor before the 'works completion certificate' is issued/recommended to the Client.</p> <p>All clean-up and restoration operations, including road-side and structure construction site clean-up; burrow area rehabilitation; provision of drainage and slope protection measures and; restoration of top-soil shall be completed. All disposal pits or trenches will be filled in disinfected and effectively sealed off. Residual topsoil, if any will be distributed or spread evenly at plantation sites, on adjoining/near-by barren land or affected agricultural land adjacent to the RoW.</p> <p>The Engineer shall ensure through site inspection that the Contractor and Engineer have complied with all these provisions prior to 'taking-over' the milestone stretch in question.</p>



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IDENTIFICATION OF DISPOSAL SITE LOCATIONS

[One Time Format. to be filled by the Contractor before dumping in each location]

Link : _____

[Give changes and nearest settlements from both ends]

Sl. No.	Criteria on which Information for each site is to be collected	Site 1	Site 2	Site 3
1	Existing Land Use			
2	Area covered (m ²)			
3	Total Material that can be dumped within the site (m ²)			
4	Depth to which dumping is feasible (m)			
5	Distance of nearest watercourse (m)			
6	Nearest Settlement (m)			
7	Date/s of Community Consultation/s			
8	Whether the community is agreeable to siting of dumping site (Y/N)			
9	Date of Permission from Villager/local community			
10	Proposed future use of the Site			
11	Selected Site (tick any one column only)			

Enclosures: [Tick as appropriate]

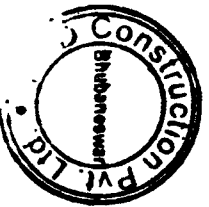
1. Map of each location (Totalno.s) Attached / Not Attached
2. Photographs of
 - a. Each disposal location Attached/ Not Attached
 - b. Each community consultation Attached/ Not Attached

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3. Photo copy of Agreement with individual owners

- a. Mr. : Attached/ Not Attached
b. Mr. : Attached/ Not Attached

Remarks

Submitted	Checked	Approved
Signature.....	Signature.....	Signature.....
Name.....	Name.....	Name.....
Designation..... Contractor	Environmental Engineer. Construction Supervision Consultant	Resident Engineer



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SETTING-UP CONSTRUCTION CAMP AND STORAGE AREA

Form P2

[One Time Format, to be filled by the Contractor & submitted
before target date of establishing camps or each time before change of layout]

Location of Camp : _____
Date _____

Sl. No.	Item	Unit	Details
1.	Detail of item camp		
a.	Size of Camp	m x m	
b.	Area of Camp	Sq.m	
c.	Distance from Nearest Settlement		
d.	Distance from Nearest Water Source [Type/Size/Capacity/present Use/Ownership]		
e.	Date of camp being operational dd/mm/yy		
f.	Present land use		
g.	No of trees with girth > 0.3m.		
h.	Details of Storage area (Availability of impervious surface)	Mxm	
i.	Availability of separate waste disposal from storage area	Cum	
2.	Details of topsoil stacking		
a.	Quantity of top soil removed	Sq.m	
b.	Details of storage of topsoil [Describe stacking arrangement]		

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	workers		
o.	Size of septic tank for W/C/Baths	Mxm	
p.	Capacity of Water Tank for WCs /Bathrooms and general purpose	cum	
q.	Fencing around camp	Y/N	
5.	Details of facilities		
a.	Availability of security 24 hrs a day	Yes/No	
b.	Details of First Aid Facility	Yes/No	
c.	Availability of Day Care Centre	Yes/No	
d.	Availability of dust bins (capacity 60 ltr)	Nos	

Encl:

- Site Layout of Construction camp Attached/ Not Attached
- Drawings of dwelling units with allied facilities Attached/ Not Attached

Remarks

Submitted

Signature:.....

Name:.....

Designation:.....
Contractor

Checked

Signature:.....

Name:.....

Environmental Engineer.
Construction Supervision Consultant

Approved

Signature:.....

Name:.....

Resident Engineer


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Form P3

ESTABLISHMENT OF BURROW AREAS PRIOR TO OPENING

[One time Format, to be submitted by the Contractor for taking consent for opening of EACH Burrow area]

Link No. _____ [Give chainages and nearest settlements from both ends]

Material _____

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Sl. No.	Location				Area m x m	Quantity of Available Material (cum)	Distance from nearest Water Course (m)	Distance from nearest Settlement(m)	Land Use		No. of Trees Affected	Rehabilitation Measures Proposed
	Name of Village	Chainage of Project Road (km)	Side (LHS /RHS)	Haul road length (km)					Before	After		

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Chief Engineer
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- Photograph of Proposed Site
- Location Map
- Agreement with Land Owner

Attached/ Not Attached
Attached/ Not Attached
Attached/ Not Attached

Chief Engineer
World Bank Project
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Submitted

Signature.....

Name.....

Designation.....

Contractor

Checked

Signature.....

Name.....

Environmental Engineer.

Construction Supervision Consultant

Approved

Signature.....

Name.....

Resident Engineer

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Chief Engineer,
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[Signature]
Link _____

Form P4

ESTABLISHMENT OF HOT MIX PLANT /BATCH MIX PLANT
[To be submitted by Contractor for taking permission from PMU]

Sl. No.	Location				Area (m ²)	Distance from nearest Water Course (m)	Distance from nearest Settlement	Existing Land Use	Prevalent Wind Direction	Weather in Down Wind Direction (Y/N)	Approved by EO (Y/N)	Remark
	Name of Village	Chainage (km)	Side (LHS /RHS)	Haul road length (m)								

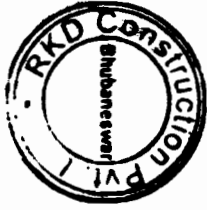
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1. Photograph of Proposed Site Attached/ Not attached
2. Site Plan Attached/ Not attached
3. Permission from OSPCB Attached/ Not attached (Valid upto _____)

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[Signature]

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Submitted

Signature.....

Name.....

Designation.....

Contractor

Checked

Signature.....

Name.....

Environmental Engineer.

Construction Supervision Consultant

Approved

Signature.....

Name.....

Resident Engineer

Chief Engineer
World Bank Projects, Odisha
EMPLOYER

Chief Engineer
World Bank Project
O/o the E.I.C.(Civil), Odisha
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Form P5**ROAD SAFETY REPORTING FORMATS**[Reporting by Contractor to PMU before commencement of construction in the *Working Zone*]

Link _____

DIVERSION at location : km _____

Report-Date:.....

Sl. No.	Item	Unit	Remarks
Details of Construction Zone			
1.	Length of Working Zone	m	
2.	Distance between this and adjacent construction zone	m	
3.	Length of approach transition zone (should be min 50 for a speed of 50 km/ hr)	m	
4.	Length of terminal transition zone	m	
5.	Length of Longitudinal Buffer Zones	m	
6.	Length of Lateral Buffer Zone	m	
Signage's In advance warning zone			
1.	Sign 'Men at Work' before 200m	Y/N	
2.	Sign 'Men at Work' before working zone	Y/N	
3.	Signage saying 'Compulsory Keep Right /Left' provided	Y/N	
4.	Signage saying 'Narrow Road on left/ right' provided	Y/N	
Signage in Approach Transition Zone			
1.	Signage saying 'Compulsory Keep Right /Left' provided	Y/N	
2.	Delineators placed along length of transition	Y/N	



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	Signage in work zone		
1.	Hazard Marker placed where railing for CD structure on diversion starts	Y/N	
2.	Barricade on either side of work sub zone	Y/N	
	Signage in Terminal transition zone		
1.	Sign for Restriction Ends	Y/N	
	Road Delineator		
1.	Delineator posts provided	Y/N	
2.	Sand bag delineators with Retroreflective stickers provided	Y/N	
3.	Object Makers Provided	Y/N	

1. Sketch of construction zone showing all sub zones and location of signs Attached/ Not Attached
2. Format on Acquisition of Temporary diversions Attached/ Not Attached

Submitted	Checked	Approved
Signature.....	Signature.....	Signature.....
Name.....	Name.....	Name.....
Designation.....	Environmental Engineer.	Resident Engineer
Contractor	Construction Supervision Consultant	

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Form P6

ARRANGEMENT FOR TEMPORARY LAND

[Quarterly Reporting by Contractor to PMU, Site Layout of all locations to be attached with this format]

Report - Date: _____

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Sl. No.	Item	Target date for Establishment	Date of Establishment	Location					Present Land use	Size (m x m)	Existing Trees >30 cm girth	Dist. From nearest settlement	Dist. From nearest water source	Site approved or not (Y/N)	Remarks by CMU (PRBDB) if any
				Name of Village	Chainage (km)	Side (LHS /RHS)	Area (m ²)	Haul road length (m)							
1	Burrow Areas														
	BA 1														
2	Workers Camps														
	WC 1														
3	Site for Batching Plant														
	BP 1														
4	Site for Hot Mix Plant														
	HMP 1														
	Stock Yard														

Chief Engineer
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O/o the E.I.C.(Civil), Odisha
Bhubaneswar.

Chief Engineer
World Bank Project
Odisha
EMPLOYER

Form P7

IDENTIFICATION OF SOURCE OF WATER FOR CONSTRUCTION

[Monthly Reporting by the Contractor]

Link _____ Report – Date: _____

Sl. No.	Source (Name)	Location /Ch.	Distance from Road	Permission Required	Remarks

Submitted	Checked	Approved
Signature.....	Signature.....	Signature.....
Name.....	Name.....	Name.....
Designation.....	Environmental Engineer.	Resident Engineer
Contractor	Construction Supervision Consultant	



M/s RKD Construction Pvt. Ltd
CONTRACTOR




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Bhubaneswar.

DETAILS OF EARTHWORK

[Monthly Report to be filled by the Contractor for Each Burrow Area under use]

Link _____ Month.....

Date of Submission.....

Location of Burrow Area under use _____


	Name of Village	Chainage (km)	Side (LHS / RHS)	Haul road length (m)
I				
II				

2. Details of Burrow Areas

2.1	Capacity of the Burrow Area	
2.2	Percentage of the capacity exhausted	
2.3	Total quantity of the Earth Excavated (in cum)	
2.4	Quantity of Top Soil removed from the Burrow Areas	
2.5	Location of Top Soil stored removed	
2.6	Quantity of Top Soil stored at the beginning of the month	
2.7	Quantity of Top Soil utilized at the end of the month	
2.8	Location (s) where Top Soil has been utilized (Specify on a location plan)	
2.9	Quantity of earthwork excavation from existing road	
2.10	Total quantity of earthwork reused in cum. (5%)	
2.11	Location disposal (if other than sites) (Specify clearly on a location plan)	


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Page 93


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2.12	Quantity of earthwork re-used in fill operation	
2.13	Location of burrow areas in disuse / exhausted	
2.14	Outline a rehabilitation plan for each of the exhausted burrow areas with special reference to Erosion Protection Measures. Also, submit at separate detailed rehabilitation plan for exhausted burrow areas for approval supported adequately with layouts, plans and drawings.	

Remarks		

Submitted	Checked	Approved
Signature.....	Signature.....	Signature.....
Name.....	Name.....	Name.....
Designation.....	Environmental Engineer.	Resident Engineer
Contractor	Construction Supervision Consultant	



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EMPLOYER

DETAILS OF HOT MIX PLANT

[Monthly Report for Each Hot Mix Plant , to be filled by the Contractor]

Reporting Month.....

Date of Submission.....

1. Environment Features of the surrounding area

1.1	Name and location of Hot Mix Plant (w.r.t. PWD km ch.)	
1.2	Wind direction	
1.3	Name (s), distance population and type of settlements in a 1.5 km radius of site.	

2. Draw/ Attach Sketch Plan of HMP clearly indicating distance and approach roads.

--

3. Details of HMP and Mitigation Measures taken

3.1	Installed Capacity	
3.2	Average Utilization	
3.3	Make	
3.4	Model	
3.5	Last Serviced	

4. Explain Air Pollution Control Measures taken at the HMP site


--

5. Explain Noise Pollution Control Measures taken at the HMP site

--


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Remarks

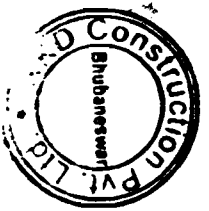
Submitted	Checked	Approved
Signature.....	Signature.....	Signature.....
Name.....	Name.....	Name.....
Designation..... Contractor	Environmental Engineer. Construction Supervision Consultant	Resident Engineer


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Page 96


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DETAILS OF LAND FILL OPERATIONS

[Monthly Report for Each Land Fill site, to be filled by the Contractor]

Month.....

Reporting


Reporting Date

1. Environment Features of the surrounding area

1.1	Location of each land fill site (Provide sketch Map below)	Name of Village	Chainage (km)	Side (LHS/RHS)	Haul road length (m)
1.2	Capacity of each land fill site				
1.3	Safety measure taken at land fill site (s)	1.			
		2.			
		3.			

1. Sketch maps Attached/ Not attached
 2. 2.

Submitted	Checked	Approved
Signature.....	Signature.....	Signature.....
Name.....	Name.....	Name.....
Designation..... Contractor	Environmental Engineer. Construction Supervision Consultant	Resident Engineer


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DETAILS OF MACHINERY IN OPERATION

[Monthly Report , to be filled by the Contractor]

Link _____
 Month.....

Reporting

Date of Submission.....

1. Details of Machinery Operation

Sr. no.	Machinery in operation	Registration No./ Mark	Make	Validity date of Pollution Control Certificate
1	Pavers	1.		
		2.		
2	Rollers	1.		
		2.		
3	Number of excavators	1.		
		2.		
4	Number of graders	1.		
		2.		
5	Number of dumpers	1.		
		2.		
		3.		
6	Others (Give details)			

1. Copy of OSPCB emission control certificates (To be attached Quarterly)
 Attached

Attached/ Not


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 Bhubaneswar.




Remarks

Submitted	Checked	Approved
Signature.....	Signature.....	Signature.....
Name.....	Name.....	Name.....
Designation.....	Environmental Engineer.	Resident Engineer
Contractor	Construction Supervision Consultant	


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EMPLOYER

Chief Engineer,
World Bank Project
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DETAILS OF WORKSHOPS IN OPERATION

[Quarterly Report , to be filled by the Contractor]

Reporting

Month..... Date of
Reporting.....

Sr. No.	Details	Location 1	Location 2	Location 3
1	No. of workshops with repairs facility (furnish location and type of facility provided)			
2	Number of vehicles in repair at each location			
3	Number of oil interceptor provided in each repair / fuelling site			
4	Total quantity of oil and wastes recovered in each interceptor during last month. (kg /			

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	lit)			
5	Details of waste disposal. (Whether Sold/ Disposed)			

Submitted	Checked	Approved
Signature.....	Signature.....	Signature.....
Name.....	Name.....	Name.....
Designation..... Contractor	Environmental Engineer. Construction Supervision Consultant	Resident Engineer


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[Handwritten Signature]

REDEVELOPMENT OF BURROW AREAS

[Monthly Reporting Format to be filled by the Contractor]

Report-Date _____

Sl. No.	Burrow Area No.	Rehabilitation Measures	Date of approval of Rehabilitation	Date of Handing Over back to the Owner	Remarks

Page 102

- | | |
|---------------------------------------------------|------------------------|
| 1. Drawing for Redevelopment for each Burrow Area | Attached/ Not Attached |
| 2. Photographs of sites before use | Attached/ Not Attached |
| 3. Photographs of sites after rehabilitation | Attached/ Not Attached |

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[Handwritten Signature]

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[Handwritten Signature]

Submitted
Signature.....
Name.....
Designation.....
Contractor

Checked
Signature.....
Name.....
Environmental Engineer.
Construction Supervision Consultant

Approved
Signature.....
Name.....
Resident Engineer

Chief Engineer
World Bank Projects, Odisha
EMPLOYER

[Handwritten Signature]

Chief Engineer
World Bank Project
O/o the E.I.C. (Civil), Odisha
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SAFETY CHECK LIST


[Monthly Reporting Format to be filled by the Contractor for each location]

Name of Safety Officer _____
 Date of Inspection _____
 Location

Description	Category		
	A	B	C
General			
House Keeping			
Stacking of Material			
Passageway			
Lighting			
Ventilation			
Others			
Electrical			
Switches			
Wiring			
Fixed Installation			
Portable Lighting			
Portable Tool			
Welding Machine			
Others			
Fire Prevention			
Fire Fighting Appliance			
Dangerous Goods Store			
Gas Welding Cylinders			
Others			
Dust Control			
Noise Control			
First Aid Equipment			
Washing Facility			
Latrine			
Canteen			
Provision of Personal Protective			
Helmet			
Eye Protector			
Ear Protector			
Respirator			
Safety Shoes			
Safety Belts			
Others			

A: Adequate at time of inspection ; B: Needs Improvement ; C: Needs Immediate Attention

Remarks


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Submitted	Checked	Approved
Signature.....	Signature.....	Signature.....
Name.....	Name.....	Name.....
Designation.....	Environmental Engineer.	Resident Engineer
Contractor	Construction Supervision Consultant	


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 Chief Engineer
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 EMPLOYER

 Chief Engineer
 World Bank Project
 O/o the E.I.C.(Civil), Odisha
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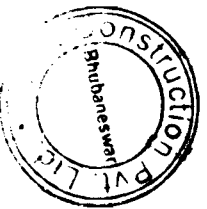
Part-II

[To be completed Upon Finalization of Employee's compensation Claim]

- 101 () No permanent incapacity
- 102 () Less than 5% incapacity
- 103 () More than 5% incapacity
- 104 () Final

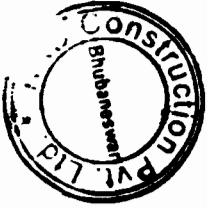
Submitted	Checked	Approved
Signature.....	Signature.....	Signature.....
Name.....	Name.....	Name.....
Designation..... Contractor	Environmental Engineer. Construction Supervision Consultant	Resident Engineer

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Form C9

POLLUTION MONITORING

(Periodically To be submitted by Contractor for locations at which monitoring to be conducted as per EMP)

Report – Date: _____

Compliance to Mitigation measures suggested in last report

If not reasons thereof.....

Page 109

Sl. No.	Chainage (km)	Details of locations	Duration of monitoring	Instruments used	Completion	Standards	Results	Reasons for exceeding standards	Mitigation Measures suggested	Type of area (Residential /Industrial /Commercial)	Remarks
1. Air Monitoring											
						SPM	SPM				
						RSPM	RSPM				
						HC	HC				
						Sox	Sox				

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Chief Engineer
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EMPLOYER



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Chainage (km)	Details of locations	Duration of monitoring	Instruments used	Completion	Standards	Results	Reasons for exceeding standards	Mitigation Measures suggested	Type of area (Residential /Industrial /Commercial)	Remarks
3. Soil Monitoring										
					pH Organic Matter Alkalinity Conductivity Water holding Capacity Pb	pH Organic Matter Alkalinity Conductivity Water holding Capacity Pb				
4.Noise Monitoring										
					L day equivalent L night equivalent L equivalent	L day equivalent L night equivalent L equivalent				

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Chief Engineer
World Bank Project
EMPLOYER

Signature

Chief Engineer
World Bank Project
O/o the E.I.C.(Civil), Odisha
Bhubaneswar.



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CONTRACTOR

Remark

Page 112

Submitted

Signature.....

Name.....

Designation.....

Contractor

Checked

Signature.....

Name.....

Environmental Engineer.

Construction Supervision Consultant

Approved

Signature.....

Name.....

Resident Engineer

World Bank Projects, Odisha
EMPLOYER

Chief Engineer
World Bank Project
O/o the E.I.C.(Civil), Odisha
Bhubaneswar.

RESTORATION OF CONSTRUCTION SITES

(Monthly To be submitted by Contractor for locations at which monitoring to be conducted as per EMP)


Link _____

Report-Date.....

Sl. No.	Contract Package	Labour Camp		Construction Camp		Plant Site		Burrow areas		Disposal Locations		Top Soil	
		O	R	O	R	O	R	O	R	O	R	Preserved	Restored

Remarks

Submitted	Checked	Approved
Signature.....	Signature.....	Signature.....
Name.....	Name.....	Name.....
Designation.....	Environmental Engineer.	Resident Engineer
Contractor	Construction Supervision Consultant	



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EMPLOYER

Chief Engineer
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FORMAT FOR KEEPING RECORDS OF CONSENT OBTAINED BY CONTRACTOR
[Monthly Format]

Report-Date: _____

Sl. No.	Clearance	Applicable Acts	Agencies	Obtained on	Valid upto	Remarks
1						
2						
3						
4						
5						
6						

Remarks

Verified

Countersigned

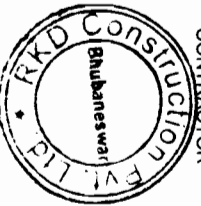


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Chief Engineer
World Bank Projects, Odisha
EMPLOYER

Chief Engineer
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O/o the E.I.C.(Civil), Odisha
Bhubaneswar.



Signature.....

Signature.....

Name.....

Name.....

Resident Engineer

Executive Engineer (PMU)

Construction Supervision Consultant

M/s RKD Construction Pvt. Ltd
CONTRACTOR



A handwritten signature in black ink, appearing to be "R.K.D.", written over a horizontal line.

Chief Engineer
World Bank Projects, Odisha
EMPLOYER

A handwritten signature in black ink, appearing to be "S.K.", written over a horizontal line.

Chief Engineer
World Bank Project
O/o the E.I.C.(Civil), Odisha
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CHECK LIST FOR ENVIRONMENT INSPECTION
[Monthly Format]

Date of Inspection _____

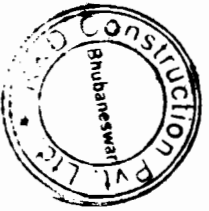
Sl. No.	ESMP Measures	Remarks
1	Provision of a personnel accountable for implementation of ESMP /Safety Measures with Contractor	
2	Consent of PCB to Establish HMP	
3	Consent of PCB to operate HMP	
4	Compliance of PCB Conditions for HMP installation and operation	
5	Whether compliance reported through monthly Progress report to Divisional Office of Executive Engineer	
6	PUC taken for all Construction vehicles	
7	Concrete platform with trap under bitumen boiler, Fuel Tank for HMP and generator set provided or not	
8	Precautions to prevent contamination of soil by emulsion, Bitumen, oil and lubricant taken while storing	
9	Providing cover to fine construction material & bituminous mix during transportation	
10	Burrow areas:	
	a) Burrow areas approved by Department	
	b) Existing land was used	
	c) Nos Opened	
	d) Available Quantity	
10	e) Utilized Quality	
	f) Balance Quantity	
	g) Nos of Burrow areas Rehabilitated	
11	Spoil and debris disposal:	
	a) Present status of land	
	b) Closure and completion plan	
12	Site specific traffic Safety management Plan:	

[Signature]
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[Signature]
Chief Engineer
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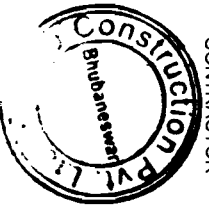
	a) Contractor installed the warning /regulatory Traffic signs at the construction site	
	c) The arrangement adequate	
13	Safety equipment i.e. helmet, gloves, gumboot, mask, carplugs etc. provided to workers	
14	Health Facility at camp and work site i.e. First Aid kit & suitable vehicle for conveyance in case of emergency / accident	
15	Permit for Procuring River sand	
16	License from Department of mines for quarrying	
17	Consent to establish / operation of crusher	
18	Provision of labour camp with sanitation & potable water	
19	Fire precautions at Hot Mix Plant and site Office	
20	Air and noise monitoring done in camp site	
21	Whether any cultural property is being impacted	
22	Status of drainage provision in camp area	
23	General House Keeping	

Remarks	
----------------	--

Verified

Signature:.....

Ms RKD Construction Pvt. Ltd
CONTRACTOR



Countersigned

Signature:.....

Chief Engineer
World Bank Projects, Odisha
EMPLOYER

Chief Engineer
World Bank Project
O/o the E.I.C.(Civil), Odisha
Bhubaneswar.

Name.....

Name.....

Resident Engineer

Executive Engineer (PMU)

Construction Supervision Consultant

M/s RKD Construction Pvt. Ltd
CONTRACTOR

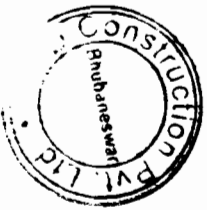


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EMPLOYER




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O/o the E. I. C. (Civil), Odisha
Bhubaneswar.



SUMMARY SHEET
[To be filled MONTHLY by PMU]

Month _____ Date _____

Sl. No.	Description	Remarks
1	No Objection Certificate	
	A Hot mix Plant	
	Location 1	
	Location 2	
	Location 3	
B	Cement batching Plant	
	Location 1	
	Location 2	
	Location 3	
2	Pollution Under Certificate	
	Vehicles	
3	Machineries	
	No objection Certificate for Diesel Gen set	
	Location 1	
	Location 2	
4	Labour Camps	
	No. of sites Identified	
	Approved	
	Opened	
	Conforms to conditions imposed at the time of opening of sites	
	Closed	
5	Workers	
	No of workers employed	
	No of male workers	
	No of female workers	
	No of day workers	
6	Burrow Area	
	No. of sites identified	
	Approved	
	Opened	
	Quantity of available material	
	Quantity of material Utilized	
	Quantity of Topsoil preserved	
	Quantity to top soil used	
	No. of sites closed	
	No. of sites Rehabilitated	
7.	Quarry	
	No. of sites identified	
	Approved	
	Opened	
	Material available	
	Material obtained	


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Sl. No.	Description	Remarks
	No. of sites Rehabilitated	
8	Disposal Locations	
	No. of sites identified	
	Approved	
	Opened	
	Amount of Waste disposed	
	Type of waste disposed	
	No. of sites Rehabilitated	
9	Road Safety	
	Road Safety norms followed as per guidelines, SP-55 and approved Traffic plan	
10	Cleaning of Culvert/ drains	
	No. of culverts/ drains	
	Nos. Cleaned	
11	Trees	
	No of trees marked for cutting in field	
	No of trees cut	
	No of trees to be Planted	
	Trees Planted	
12	Haul Roads	
	Adequacy of maintenanc of Haul Road Network	

Remarks

Verified

Countersigned

Signature.....

Signature.....


Name.....

Name.....

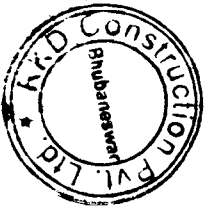
Resident Engineer

Executive Engineer (PMU)

Construction Supervision Consultant


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World Bank Projects, Odisha
EMPLOYER



Grand Summary of Price Schedule

Contract Name: Widening and Strengthening of Existing Carriageway to 2 lane from Berhampur - Tapiparani (0/0 km to 41/0 km of SH-17)(Balance Work)- NCB Package OSRP-Bal-03

Contract No.: Agreement No. x of 2012 - 13

<i>General Summary</i>	<i>Page</i>	<i>Amount</i>
BILL NO.1 : SITE CLEARANCE	1	3,416,600.00
BILL NO.2 : EARTH WORKS	3	84,730,665.00
BILL NO.3 : SUB-BASE AND BASE COURSES	5	248,189,350.00
BILL NO.4 : BITUMINOUS COURSES	6	295,298,867.00
BILL NO.5 : CULVERTS AND UNDERPASSES	7	73,683,435.00
BILL NO.6 : BRIDGES	12	57,540,008.00
BILL NO.7 : RETAINING WALL, DRAINAGE AND PROTECTIVE WORKS	17	41,712,101.00
BILL NO.8 : ROAD SAFETY AND AMENITIES	20	109,154,110.00
BILL NO.9 : MAINTENANCE, REPAIR AND REHABILITATION	25	15,776,450.00
BILL NO.10 : ENVIRONMENTAL MITIGATION MEASURES	26	32,289,172.00
Subtotal of Bills	(A)	961,790,758.00
Total for Daywork (Provisional Sum)	(B)	6,460,500.00
Total of Bills Plus Provisional Sums (A + B)	(C)	968,251,258.00
Add Provisional Sum for Contingency Allowance	(D)	500,000.00
Final Bid Price (C+D)	(E)	968,751,258.00

Rupees Ninety Six Crores Eighty Seven Lakhs Fifty One Thousand Two Hundred Fifty Eight Only


 Chief Engineer
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 World Bank Projects, Odisha
 EMPLOYER

Chief Engineer
 World Bank Project
 O/o the E.I.C.(Civil), Odisha
 Bhubaneswar.





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[Handwritten Signature]

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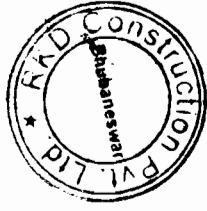
World Bank Projects, Odisha
EMPLOYER

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World Bank Project
O/o the E.I.C.(Civil), Odisha
Bhubaneswar.

[Handwritten Signature]

Contract Name: Widening & Strengthening of existing carriageway to 2-lane road from Berhampur to Taptapani (Km 0/0 to Km 41/0 of SH-17) (Balance Work)(Package No-OSRP-Bal-P03)
PRICE SCHEDULE (Works Items & Dayworks)

Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
BILL NO.1 : SITE CLEARANCE					
1.01	Cleaning and Grubbing for road land complete as per Technical Specification Clause 201 and as per the direction of Engineer.	Hectare	46.00	24000.00 Rupees Twenty Four Thousand Only	1,104,000.00 Rupees Eleven Lakhs Four Thousand Only
1.02	Dismantling structures and pavement including disposal of resulting material complete as per Technical Specification Clause 202, 2809 and as per the direction of Engineer.				
	a) Brick/ Stone Structures	Cum	2999.00	130.00 Rupees One Hundred Thirty Only	389,870.00 Rupees Three Lakhs Eighty Nine Thousand Eight Hundred Seventy Only
	b) Concrete/Reinforced concrete/ Prestressed concrete structures including cleaning straghtening & cutting of bars and separating them out from RCC/PSC.				
	For Slab Culverts & Box Culverts and Bridges				
	i)P.C.C.	Cum	1095.00	300.00 Rupees Three Hundred Only	328,500.00 Rupees Three Lakhs Twenty Eight Thousand Five Hundred Only
	ii)R.C.C.	Cum	3121.00	425.00 Rupees Four Hundred Twenty Five Only	1,326,425.00 Rupees Thirteen Lakhs Twenty Six Thousand Four Hundred Twenty Five Only
	c) Dismantling of Pavement course	Cum	100.00	180.00 Rupees One Hundred Eighty Only	18,000.00 Rupees Eighteen Thousand Only
	d) Hume pipe	Lm	484.00	160.00 Rupees One Hundred Sixty Only	77,440.00 Rupees Seventy Seven Thousand Four Hundred Forty Only
	e) Kerb	Lm	60.00	15.00 Rupees Fifteen Only	900.00 Rupees Nine Hundred Only



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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
	f) Dry stone pitching	Cum	51.00	175.00 Rupees One Hundred Seventy Five Only	8,925.00 Rupees Eight Thousand Nine Hundred Twenty Five Only
	g) RCC railing	Lm	272.00	45.00 Rupees Forty Five Only	12,240.00 Rupees Twelve Thousand Two Hundred Forty Only
	h) Expansion joint	Lm	138.00	500.00 Rupees Five Hundred Only	69,000.00 Rupees Sixty Nine Thousand Only
	i) Cement Concrete Wearing Coat	Sqm	271.00	300.00 Rupees Three Hundred Only	81,300.00 Rupees Eighty One Thousand Three Hundred Only
	Total for Bill No. 1 Carried forward to Summary				3,416,600.00
					Rupees Thirty Four Lakhs Sixteen Thousand Six Hundred Only

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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
BILL NO.2 : EARTH WORKS					
2.01	Roadway and Drainage excavation necessary for construction of roadway complete as per Technical Specification Clause 301 and as per the direction of Engineer.				
	a) All kinds of soil	Cum	266256.00	70.00 Rupees Seventy Only	18,637,920.00 Rupees One Crore Eighty Six Lakhs Thirty Seven Thousand Nine Hundred Twenty Only
	b) Soft Rock (Blasting not required) (LS)	Cum	1000.00	160.00 Rupees One Hundred Sixty Only	160,000.00 Rupees One Lakh Sixty Thousand Only
	c) Hard Rock (Blasting required) (LS)	Cum	956.00	350.00 Rupees Three Hundred Fifty Only	334,600.00 Rupees Three Lakhs Thirty Four Thousand Six Hundred Only
	d) Hard rock (Blasting not required) (LS)	Cum	1000.00	400.00 Rupees Four Hundred Only	400,000.00 Rupees Four Lakhs Only
2.02	Construction of embankment with approved material complete as per drawing and Technical Specification Clause 305 and as per the direction of Engineer.	Cum	48977.00	150.00 Rupees One Hundred Fifty Only	7,346,550.00 Rupees Seventy Three Lakhs Forty Six Thousand Five Hundred Fifty Only
2.03	Construction of subgrade and earthen shoulder with approved material as per drawing complete and Technical Specification Clause 305 and as per the direction of Engineer.	Cum	291101.00	175.00 Rupees One Hundred Seventy Five Only	50,942,675.00 Rupees Five Crores Nine Lakhs Forty Two Thousand Six Hundred Seventy Five Only
2.04	Construction of embankment and subgrade with suitable material deposited at site from roadway and drainage excavation all complete as per drawing and Technical Specification Clause 305 and as per the direction of Engineer.	Cum	54728.00	75.00 Rupees Seventy Five Only	4,104,600.00 Rupees Forty One Lakhs Four Thousand Six Hundred Only

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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
2.05	Loosening and recompacting the existing subgrade in all kinds of soil complete as per Technical Specification Clause 305 and as per the direction of Engineer.	Cum	35375.00	20.00 Rupees Twenty Only	707,500.00 Rupees Seven Lakhs Seven Thousand Five Hundred Only
2.06	Earthwork with agriculture soil for filling of median/island complete as per Technical Specification Clause 407 and as per the direction of the Engineer.	Cum	1620.00	110.00 Rupees One Hundred Ten Only	178,200.00 Rupees One Lakh Seventy Eight Thousand Two Hundred Only
2.07	Scarifying the existing bituminous surface layers complete as per Technical Specification Clause 501 and as per the direction of Engineer.	Sqm	72488.00	15.00 Rupees Fifteen Only	1,087,320.00 Rupees Ten Lakhs Eighty Seven Thousand Three Hundred Twenty Only
2.08	Stripping, storing of top soil by road side at 15 m internal and re-application on embankment slopes, cut slopes and other areas in localities where the available embankment material is not conducive to plant growth as directed by the Engineer and as per technical specification-305.	Cum	13855.00	60.00 Rupees Sixty Only	831,300.00 Rupees Eight Lakhs Thirty One Thousand Three Hundred Only
Total for Bill No. 2 Carried forward to Summary					84,730,665.00 Rupees Eight Crores Forty Seven Lakhs Thirty Thousand Six Hundred Sixty Five Only

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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
BILL NO.3 : SUB-BASE AND BASE COURSES					
3.01	Construction of Granular Sub-base course using crushed stone aggregate by providing the materials conforming to Gr-I of Table 400-2 complete as per Technical Specification Clause 401 and as per the direction of the Engineer.	Cum	90353.00	1350.00 Rupees One Thousand Three Hundred Fifty Only	121,976,550.00 Rupees Twelve Crores Nineteen Lakhs Seventy Six Thousand Five Hundred Fifty Only
3.02	Construction of wet mix macadam complete as per Technical Specification clause 406 and as per the direction of Engineer.	Cum	85568.00	1475.00 Rupees One Thousand Four Hundred Seventy Five Only	126,212,800.00 Rupees Twelve Crores Sixty Two Lakhs Twelve Thousand Eight Hundred Only
Total for Bill No. 3 Carried forward to Summary					248,189,350.00
					Rupees Twenty Four Crores Eighty One Lakhs Eighty Nine Thousand Three Hundred Fifty Only

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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
BILL NO.4 : BITUMINOUS COURSES					
4.01	Providing Primer coat over granular surface complete all as per Technical specification clause 502 and as per the direction of Engineer.	Sqm	329519.00	23.00 Rupees Twenty Three Only	7,578,937.00 Rupees Seventy Five Lakhs Seventy Eight Thousand Nine Hundred Thirty Seven Only
4.02	Providing Tack coat complete as per Technical Specification clause 503 and as per the direction of Engineer.				
	a) Granular surface treated with primer	Sqm	325069.00	10.00 Rupees Ten Only	3,250,690.00 Rupees Thirty Two Lakhs Fifty Thousand Six Hundred Ninety Only
	b) over normal bituminous surface	Sqm	401244.00	10.00 Rupees Ten Only	4,012,440.00 Rupees Forty Lakhs Twelve Thousand Four Hundred Forty Only
4.03	Providing Dense Bituminous Macadam course using Bitumen Grade-60/70 (VG-30) complete as per Technical Specification Clause 507 and as per the direction of Engineer.	Cum	22206.00	6800.00 Rupees Six Thousand Eight Hundred Only	151,000,800.00 Rupees Fifteen Crores Ten Lakh Eight Hundred only
4.04	Providing Bituminous Concrete wearing course using CRMB-55 complete as per Technical Specification Clause 509 and as per the direction of Engineer.	Cum	16182.00	8000.00 Rupees Eight Thousand Only	129,456,000.00 Rupees Twelve Crores Ninety Four Lakhs Fifty Six Thousand Only
Total for Bill No.4 Carried forward to Summary					295,298,867.00 Rupees Twenty Nine Crores Fifty Two Lakhs Ninety Eight Thousand Eight Hundred Sixty Seven Only

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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
BILL NO.5 : CULVERTS AND UNDERPASSES					
5.01	Earthwork in excavation of foundation for structures complete as per drawing and technical specifications clause 304 including all leads and lifts and as per the direction of Engineer.	Cum	3821.00	70.00 Rupees Seventy Only	267,470.00 Rupees Two Lakhs Sixty Seven Thousand Four Hundred Seventy Only
5.02	Earth fill below pitching in quadrant portion with approved material complete as per drawing and Technical Specification Clause 305 with all leads and lifts and as per the direction of Engineer.	Cum	2347.00	160.00 Rupees One Hundred Sixty Only	375,520.00 Rupees Three Lakhs Seventy Five Thousand Five Hundred Twenty Only
5.03	Providing and filling behind abutment, wing wall and return wall etc. and below pipe bed in layers not exceeding 150mm thick including All leads and lifts complete as per drawings, direction of the Engineer and Technical specification clause 304 and as per the direction of Engineer.	Cum	3096.00	200.00 Rupees Two Hundred Only	619,200.00 Rupees Six Lakhs Nineteen Thousand Two Hundred Only
5.04	Providing filter media behind abutment, wing wall and return wall complete as per drawing and Technical Specification clause 2504, 2509, 2510 and as per the direction of Engineer.	Cum	1213.00	550.00 Rupees Five Hundred Fifty Only	667,150.00 Rupees Six Lakhs Sixty Seven Thousand One Hundred Fifty Only
5.05	Cement Concrete M-15 grade in leveling course etc. including centering and shuttering all complete as per Drawings and Technical Specification Sections 1500 and 1700 and as per the direction of Engineer.	Cum	1606.00	3500.00 Rupees Three Thousand Five Hundred Only	5,621,000.00 Rupees Fifty Six Lakhs Twenty One Thousand Only

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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
5.06	Cement Concrete M-15 grade in foundation including centering and shuttering all complete as per Drawings and Technical Specification Sections 1500, 1700, 2200 and as per the direction of Engineer.	Cum	1304.00	3500.00 Rupees Three Thousand Five Hundred Only	4,564,000.00 Rupees Forty Five Lakhs Sixty Four Thousand Only
5.07	Cement Concrete M-15 grade in substructure & headwall including centering and shuttering all complete as per Drawings and Technical Specification Sections 1500, 1700, 2200 and as per the direction of Engineer.	Cum	3260.00	3600.00 Rupees Three Thousand Six Hundred Only	11,736,000.00 Rupees One Crore Seventeen Lakhs Thirty Six Thousand Only
5.08	Reinforced cement concrete in all types of culverts as per drawing and technical specification Section 1500, 1700 & 2200 and as per the direction of Engineer.				
	a) M-20 grade	Cum	2644.00	4200.00 Rupees Four Thousand Two Hundred Only	11,104,800.00 Rupees One Crore Eleven Lakhs Four Thousand Eight Hundred Only
	b) M-25 grade	Cum	10.00	4750.00 Rupees Four Thousand Seven Hundred Fifty Only	47,500.00 Rupees Forty Seven Thousand Five Hundred Only
5.09	Reinforced cement concrete M-30 grade in approach slabs including cost of reinforcement all complete as per Drawing and Technical Specification Clause 2704 and as per the direction of Engineer.	Cum	701.00	9000.00 Rupees Nine Thousand Only	6,309,000.00 Rupees Sixty Three Lakhs Nine Thousand Only
5.10	HYSD bar reinforcement complete as per drawing and technical specifications clause 1600 and as per the direction of Engineer.	MT	187.00	65000.00 Rupees Sixty Five Thousand Only	12,155,000.00 Rupees One Crore Twenty One Lakhs Fifty Five Thousand Only



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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
5.11	Providing laying and joining NP-4(I.S 458) hume pipes with culvert complete as per drawing Tech. Specification section 2900 and IRC special publication no.13 and as per the direction of Engineer.				
	a) 1m dia. in Single Row	Lm	499.00	4200.00 Rupees Four Thousand Two Hundred Only	2,095,800.00 Rupees Twenty Lakhs Ninety Five Thousand Eight Hundred Only
	b) 1m dia. in Double Rows	Double Row-Lm	632.00	9000.00 Rupees Nine Thousand Only	5,688,000.00 Rupees Fifty Six Lakhs Eighty Eight Thousand Only
	c) 1.2m dia. in Multiple Rows	Double Row-Lm	275.00	10700.00 Rupees Ten Thousand Seven Hundred Only	2,942,500.00 Rupees Twenty Nine Lakhs Forty Two Thousand Five Hundred Only
	d) 0.3m dia in Single Row	Lm	375.00	1200.00 Rupees One Thousand Two Hundred Only	450,000.00 Rupees Four Lakhs Fifty Thousand Only
5.12	Providing laying and joining 0.6m dia NP-3(I.S 458) hume pipes with culvert complete as per drawing Tech. Specification section 2900 and IRC special publication no.13 and as per the direction of Engineer.	Lm	620.00	2550.00 Rupees Two Thousand Five Hundred Fifty Only	1,581,000.00 Rupees Fifteen Lakhs Eighty One Thousand Only
5.13	Providing and laying filter material underneath stone pitching in slopes complete as per drawings and technical specification section 2504, 2509, 2510 and as per the direction of Engineer.	Cum	939.00	650.00 Rupees Six Hundred Fifty Only	610,350.00 Rupees Six Lakhs Ten Thousand Three Hundred Fifty Only
5.14	Providing and laying stone Pitching on embankment slopes complete as per drawing and technical specification Clause 2504.	Cum	1823.00	900.00 Rupees Nine Hundred Only	1,640,700.00 Rupees Sixteen Lakhs Forty Thousand Seven Hundred Only



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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
5.15	Providing Boulder apron for bed protection with stone boulders complete as per Drawing and Technical Specification Section 1400 and 2500	Cum	1099.00	990.00 Rupees Nine Hundred Ninety Only	1,088,010.00 Rupees Ten Lakhs Eighty Eight Thousand Ten Only
5.16	Providing weep holes in box portion, return wall, wing wall etc. all complete as per drawing and technical specification clause . 2706 and as per the direction of Engineer.	Nos	1843.00	150.00 Rupees One Hundred Fifty Only	276,450.00 Rupees Two Lakhs Seventy Six Thousand Four Hundred Fifty Only
5.17	Supplying, fitting and fixing tar paper bearings in position with all accessories as per drawings and technical specification clause 2605.	Sqm	82.00	255.00 Rupees Two Hundred Fifty Five Only	20,910.00 Rupees Twenty Thousand Nine Hundred Ten Only
5.18	Supplying and fixing Asphaltic Plug expansion joints complete as per Drawing and as per IRC: SP : 69-2005 and as per the direction of Engineer.	Lm	816.00	300.00 Rupees Three Hundred Only	244,800.00 Rupees Two Lakhs Forty Four Thousand Eight Hundred Only
5.19	Cement Concrete M-15 in Parapet in super structure complete as per Drawing and Technical Specification and as per the direction of Engineer.	Cum	320.00	3500.00 Rupees Three Thousand Five Hundred Only	1,120,000.00 Rupees Eleven Lakhs Twenty Thousand Only
5.20	Bituminous wearing course 56mm thick comprasing 50mm thick asphaltic concrete in a single layer over Bituminous mastic course 6mm thick with a prime coat complete as per Drawing and Technical Specification Section 2700, Clause 512 and as per the direction of Engineer.	Sqm	3749.00	625.00 Rupees Six Hundred Twenty Five Only	2,343,125.00 Rupees Twenty Three Lakhs Forty Three Thousand One Hundred Twenty Five Only



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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
5.21	Synthetic enamel painting of culvert no. and span arrangement as per IRC - 7 - 1971 and as per the direction of Engineer.	No.	112.00	500.00 Rupees Five Hundred Only	56,000.00 Rupees Fifty Six Thousand Only
5.22	Providing and applying 2 coats of water based cement paint to unplastered concrete surface after cleaning the surface etc. complete as per the direction of Engineer.	Sqm	1690.00	35.00 Rupees Thirty Five Only	59,150.00 Rupees Fifty Nine Thousand One Hundred Fifty Only
Total for Bill No.5 Carried forward to Summary					73,683,435.00
					Rupees Seven Crores Thirty Six Lakhs Eighty Three Thousand Four Hundred Thirty Five Only

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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
BILL NO.6 : BRIDGES					
6.01	Earthwork in excavation of foundation for structures complete as per drawing and technical specification clause 304 including all leads & lift and as per the direction of Engineer.	Cum	6019.00	66.00 Rupees Sixty Six Only	397,254.00 Rupees Three Lakhs Ninety Seven Thousand Two Hundred Fifty Four Only
6.02	Providing and filling foundation and at the back of abutment, wing wall and return wall etc. and below pipe bed in layers not exceeding 150mm thick including all leads & lifts as per Technical specification Clause 304 and as per the direction of Engineer.	Cum	1984.00	210.00 Rupees Two Hundred Ten Only	416,640.00 Rupees Four Lakhs Sixteen Thousand Six Hundred Forty Only
6.03	Providing Filter media behind abutment, wing wall and return wall complete as per drawing and technical Specification clause 2504 and as per the direction of Engineer.	Cum	135.00	650.00 Rupees Six Hundred Fifty Only	87,750.00 Rupees Eighty Seven Thousand Seven Hundred Fifty Only
6.04	Cement concrete M-15 grade in leveling course etc including centering and shuttering all complete as per drawing and Technical specification Section 1500 and 1700 and as per the direction of Engineer.	Cum	333.00	3500.00 Rupees Three Thousand Five Hundred Only	1,165,500.00 Rupees Eleven Lakhs Sixty Five Thousand Five Hundred Only
6.05	Cement concrete M-15 grade in foundation and substructure etc including centering and shuttering all complete as per drawing and Technical specification Section 1500, 1700, 2100, 2200 and as per the direction of Engineer.	Cum	768.00	3500.00 Rupees Three Thousand Five Hundred Only	2,688,000.00 Rupees Twenty Six Lakhs Eighty Eight Thousand Only
6.06	Reinforced cement concrete M-20 grade in foundation complete as per drawing & Technical specification sections 1500, 1700, 2100, 2200 and as per the direction of Engineer.	Cum	667.00	4000.00 Rupees Four Thousand Only	2,668,000.00 Rupees Twenty Six Lakhs Sixty Eight Thousand Only



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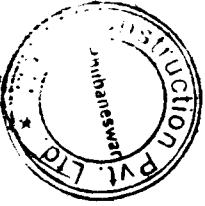
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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
6.07	Reinforced cement concrete M-20 grade in substructure complete as per drawing & Technical specification sections 1500, 1700, 2200 and as per the direction of Engineer.	Cum	1189.00	4500.00 Rupees Four Thousand Five Hundred Only	5,350,500.00 Rupees Fifty Three Lakhs Fifty Thousand Five Hundred Only
6.08	Reinforced cement concrete in super structure complete as per drawing and Technical specification section 1500, 1700, 2300 and as per the direction of Engineer.				
	a) M-25 grade	Cum	149.00	5000.00 Rupees Five Thousand Only	745,000.00 Rupees Seven Lakhs Forty Five Thousand Only
	b) M-30 grade	Cum	1772.00	5200.00 Rupees Five Thousand Two Hundred Only	9,214,400.00 Rupees Ninety Two Lakhs Fourteen Thousand Four Hundred Only
6.09	HYSD bar reinforcement complete as per drawing and technical specifications clause 1600 and as per the direction of Engineer.				
	a) in Foundation	MT	39.00	62000.00 Rupees Sixty Two Thousand Only	2,418,000.00 Rupees Twenty Four Lakhs Eighteen Thousand Only
	b) in Substructure	MT	119.00	62000.00 Rupees Sixty Two Thousand Only	7,378,000.00 Rupees Seventy Three Lakhs Seventy Eight Thousand Only
	c) in Superstructure	MT	202.00	62000.00 Rupees Sixty Two Thousand Only	12,524,000.00 Rupees One Crore Twenty Five Lakhs Twenty Four Thousand Only
6.10	Providing and fixing bearings complete as per Drawing and technical specification 2000 and as per the direction of Engineer.				
	a) Tar paper bearing	Sqm	246.00	275.00 Rupees Two Hundred Seventy Five Only	67,650.00 Rupees Sixty Seven Thousand Six Hundred Fifty Only
6.11	Reinforced cement concrete M-30 grade for in approach slabs complete as per Drawing and Technical specification section 1500, 1600, 1700, 2700 and as per the direction of Engineer.	Cum	191.00	10000.00 Rupees Ten Thousand Only	1,910,000.00 Rupees Nineteen Lakhs Ten Thousand Only



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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
6.12	Bituminous wearing course 56mm thick comprising 50mm thick asphaltic Concrete in a single layer over Bituminous mastic course 6 mm thick with a prime Coat Complete as per drawing and Technical Specification Section 2700 and as per the direction of Engineer.	Sqm	1258.00	625.00 Rupees Six Hundred Twenty Five Only	786,250.00 Rupees Seven Lakhs Eighty Six Thousand Two Hundred Fifty Only
6.13	Providing and fixing Drainage Spouts Complete as per drawing and Technical Specification Clause 2705 and as per the direction of Engineer.	No	32.00	2200.00 Rupees Two Thousand Two Hundred Only	70,400.00 Rupees Seventy Thousand Four Hundred Only
6.14	Providing and laying Stone pitching in slopes complete as per drawing and Technical Specification Section 2500 and as per the direction of Engineer.	Cum	137.00	900.00 Rupees Nine Hundred Only	123,300.00 Rupees One Lakh Twenty Three Thousand Three Hundred Only
6.15	Providing as laying fitter material underneath Stone pitching in slopes Complete as per drawing and Technical Specification clause 2504 and as per the direction of Engineer.	Cum	324.00	650.00 Rupees Six Hundred Fifty Only	210,600.00 Rupees Two Lakhs Ten Thousand Six Hundred Only
6.16	Providing weep holes in abutments, wing walls and return walls etc. as per drawing and Technical Specification clause 2706 and as per the direction of Engineer.	Nos	780.00	150.00 Rupees One Hundred Fifty Only	117,000.00 Rupees One Lakh Seventeen Thousand Only
6.17	Providing rubble Stone flooring in Cement mortar (1Cement:3 sand) and joints Complete as per drawing and Technical Specification Section 1400 and 2500 and as per the direction of Engineer.	Cum	280.00	1250.00 Rupees One Thousand Two Hundred Fifty Only	350,000.00 Rupees Three Lakhs Fifty Thousand Only



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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
6.18	Supplying and laying of Asphaltic plug joint etc. complete as per specifications and as per the direction of Engineer.	Lm	381.00	300.00 Rupees Three Hundred Only	114,300.00 Rupees One Lakh Fourteen Thousand Three Hundred Only
6.19	Synthetic enamel painting of Bridge No. and span arrangement as per IRC - 7 - 1971 and as per the direction of Engineer.	No.	32.00	600.00 Rupees Six Hundred Only	19,200.00 Rupees Nineteen Thousand Two Hundred Only
6.20	Carrying and Confirmatory bores up to required depth as locations of bridges as directed be Engineer complete in all respects handling testing as per Technical Specification Section 2400 and interpretation of the bore data and presentation of the results and as per the direction of Engineer.				
	a) Up to 20 mtr. in all types of soil (except hard rock)	Lm	210.00	1800.00 Rupees One Thousand Eight Hundred Only	378,000.00 Rupees Three Lakhs Seventy Eight Thousand Only
	b) Up to 20 mtr. in hard rock	Lm	50.00	2500.00 Rupees Two Thousand Five Hundred Only	125,000.00 Rupees One Lakh Twenty Five Thousand Only
6.21	Providing and painting of flood gauge on substructure is fall height and 500mm width and as per the direction of Engineer.	Lm	120.00	1000.00 Rupees One Thousand Only	120,000.00 Rupees One Lakh Twenty Thousand Only
6.22	Providing and laying 150mm dia. HDPE Service pipe as per drawing and as per the direction of Engineer.	Lm	678.00	750.00 Rupees Seven Hundred Fifty Only	508,500.00 Rupees Five Lakhs Eight Thousand Five Hundred Only
6.23	Providing Gravel fill below pitching in quadrant portion with approved material complete as per drawing and Technical Specification Clause 305 with all leads and lifts and as per the direction of Engineer.	Cum	1314.00	210.00 Rupees Two Hundred Ten Only	275,940.00 Rupees Two Lakhs Seventy Five Thousand Nine Hundred Forty Only



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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
6.24	PCC in flooring as per Drawing & Technical Specification section 1700, 2500 and as per the direction of Engineer.				
	a) M-15	Cum	653.00	3310.00 Rupees Three Thousand Three Hundred Ten Only	2,161,430.00 Rupees Twenty One Lakhs Sixty One Thousand Four Hundred Thirty Only
	b) M-20	Cum	218.00	4183.00 Rupees Four Thousand One Hundred Eighty Three Only	911,894.00 Rupees Nine Lakhs Eleven Thousand Eight Hundred Ninety Four Only
6.25	Reinforced cement concrete crash barrier to bridge structures as per the approved drawing and Technical Specification clause 809, and section 1500, 1600, 1700 and as per the direction of Engineer .	Lm	339.00	12500.00 Rupees Twelve Thousand Five Hundred Only	4,237,500.00 Rupees Forty Two Lakhs Thirty Seven Thousand Five Hundred Only
Total for Bill No.6 Carried forward to Summary					57,540,008.00
					Rupees Five Crores Seventy Five Lakhs Forty Thousand Eight Only

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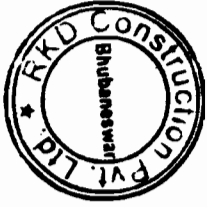
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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
BILL NO.7 : RETAINING WALL, DRAINAGE AND PROTECTIVE WORKS					
7.01	Retaining Wall				
(a)	Earthwork in excavation for foundation complete as per drawing and Technical Specification Clause 304 in Retaining wall for high embankment stretches as per the direction of Engineer.	Cum	2268.00	66.00 Rupees Sixty Six Only	149,688.00 Rupees One Lakh Forty Nine Thousand Six Hundred Eighty Eight Only
(b)	Providing and filling foundation and at the back of abutment, wing wall and return wall etc. and below pipe bed in layers not exceeding 150mm thick including all leads & lifts as per Technical specification Clause 305 and as per the direction of Engineer.	Cum	1631.00	180.00 Rupees One Hundred Eighty Only	293,580.00 Rupees Two Lakhs Ninety Three Thousand Five Hundred Eighty Only
(c)	Providing Filter media behind wall complete as per drawing and Technical Specification Clauses 2504 and as per the direction of Engineer.	Cum	2880.00	650.00 Rupees Six Hundred Fifty Only	1,872,000.00 Rupees Eighteen Lakhs Seventy Two Thousand Only
(d)	Plain cement concrete M -15 in foundation leveling course etc. including centering and shuttering all complete as per drawing and Technical Clauses 1500, 1700 and as per the direction of Engineer.	Cum	189.00	3310.00 Rupees Three Thousand Three Hundred Ten Only	625,590.00 Rupees Six Lakhs Twenty Five Thousand Five Hundred Ninety Only
(e)	Cement concrete M -20 for reinforced concrete in foundation including centering and shuttering all complete as per drawing and Technical Clauses 1500, 1700, 2100 and as per the direction of Engineer.	Cum	1314.00	4183.00 Rupees Four Thousand One Hundred Eighty Three Only	5,496,462.00 Rupees Fifty Four Lakhs Ninety Six Thousand Four Hundred Sixty Two Only



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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
(f)	Providing steel reinforcement (HYSD) for retaining wall complete as per drawing and Technical Specification Clause 1600 and as per the direction of Engineer.	MT	79.00	61265.00 Rupees Sixty One Thousand Two Hundred Sixty Five Only	4,839,935.00 Rupees Forty Eight Lakhs Thirty Nine Thousand Nine Hundred Thirty Five Only
(g)	Providing guard post complete as per drawings and Technical specifications section 806 and as per the direction of Engineer.	No.	600.00	1700.00 Rupees One Thousand Seven Hundred Only	1,020,000.00 Rupees Ten Lakhs Twenty Thousand Only
(h)	Providing weep holes in retaining wall complete as per drawing and Technical Specification Clause 2706 and as per the direction of Engineer.	No.	1200.00	150.00 Rupees One Hundred Fifty Only	180,000.00 Rupees One Lakh Eighty Thousand Only
7.02	Providing and laying stone pitching on embankment slopes as per drawing and Technical Specification Clause 2504 and as per the direction of Engineer.	Cum	1007.00	900.00 Rupees Nine Hundred Only	906,300.00 Rupees Nine Lakhs Six Thousand Three Hundred Only
7.03	Providing and laying filter material underneath stone pitching on embankment slopes as per drawing and Technical Specification Clause 2504 and as per the direction of Engineer.	Cum	504.00	650.00 Rupees Six Hundred Fifty Only	327,600.00 Rupees Three Lakhs Twenty Seven Thousand Six Hundred Only
7.04	Turfing side slopes of main road and service road with grass sods complete as per Technical Specification Clause 307 and as per the direction of Engineer.	Sqm	158274.00	29.00 Rupees Twenty Nine Only	4,589,946.00 Rupees Forty Five Lakhs Eighty Nine Thousand Nine Hundred Forty Six Only
7.05	Providing and laying in position precast cement concrete saucer drain to the required lines and grades as per Drawing and as per the direction of the Engineer.	Lm	24900.00	750.00 Rupees Seven Hundred Fifty Only	18,675,000.00 Rupees One Crore Eighty Six Lakhs Seventy Five Thousand Only



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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
7.06	Constructing RCC box type drains to the required lines and grades as per drawing and technical specification section 1500, 1600, 1700, 2100 and as per the direction of Engineer.	Lm	360.00	7600.00	2,736,000.00
				Rupees Seven Thousand Six Hundred Only	Rupees Twenty Seven Lakhs Thirty Six Thousand Only
	Total for Bill No.7 Carried forward to Summary				41,712,101.00
					Rupees Four Crores Seventeen Lakhs Twelve Thousand One Hundred One Only

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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
BILL NO-8 : ROAD SAFETY AND AMENITIES					
8.01	Providing and laying plain cement concrete kerb as per drawing and Technical Specifications Clauses 408, section 1500 and as per the direction of Engineer.	Lm	1336.00	420.00 Rupees Four Hundred Twenty Only	561,120.00 Rupees Five Lakhs Sixty One Thousand One Hundred Twenty Only
8.02	Providing and laying service ducts with 160/136mm dia HDPE Double Walled Corrugated Pipe conforming to IS:14930 (Part-II) including cutting of trenches and as per the direction of Engineer.	Lm	1650.00	990.00 Rupees Nine Hundred Ninety Only	1,633,500.00 Rupees Sixteen Lakhs Thirty Three Thousand Five Hundred Only
8.03	Providing and fixing precast RCC boundary posts complete as per drawing and Technical Specification Clause 806 and as per the direction of Engineer.	No	449.00	330.00 Rupees Three Hundred Thirty Only	148,170.00 Rupees One Lakh Forty Eight Thousand One Hundred Seventy Only
8.04	Providing and fixing precast RCC/PCC hectometer, Kilometer and 5th kilometer stones complete as per Technical Specification Clause 804 and as per the direction of Engineer.				
	a) No of (200) Hectometer Stone	No	164.00	620.00 Rupees Six Hundred Twenty Only	101,680.00 Rupees One Lakh One Thousand Six Hundred Eighty Only
	b) No of Kilometer stone	No	32.00	1700.00 Rupees One Thousand Seven Hundred Only	54,400.00 Rupees Fifty Four Thousand Four Hundred Only
	c) No. of 5th Kilometer Stone	No	9.00	2200.00 Rupees Two Thousand Two Hundred Only	19,800.00 Rupees Nineteen Thousand Eight Hundred Only
8.05	Constructing footpath/ islands complete as per drawing and Technical Specifications Clause 409 and 407 and as per the direction of Engineer.	Sqm	1230.00	1200.00 Rupees One Thousand Two Hundred Only	1,476,000.00 Rupees Fourteen Lakhs Seventy Six Thousand Only
8.06	Providing passenger shelters for Bus Bays as per drawing and Technical Specifications Section 1500, 1600, 1700, 2100, 2200, 2300 and as per the direction of Engineer.	No	26.00	150000.00 Rupees One Lakh Fifty Thousand Only	3,900,000.00 Rupees Thirty Nine Lakhs Only



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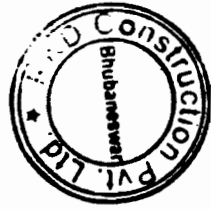
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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
8.07	Construction of temporary diversion including temporary cross drainage works where necessary and maintenance thereof including traffic control and safety complete as per Technical Specification Clause 112 and as per the direction of Engineer.	Lm	2665.00	5000.00 Rupees Five Thousand Only	13,325,000.00 Rupees One Crore Thirty Three Lakhs Twenty Five Thousand Only
8.08(a)	Providing and laying of hot applied thermoplastic compound 2.5 mm thick including reflectorising glass beads etc. complete as per Technical Specification section 800 and as per direction of Engineer.				
	Lane line / Edge marking	Sqm	11262.00	520.00 Rupees Five Hundred Twenty Only	5,856,240.00 Rupees Fifty Eight Lakhs Fifty Six Thousand Two Hundred Forty Only
8.08(b)	Painting lines, dashes, arrows etc on roads in two coats on new work with ready mixed road marking paint conforming to IS:164 on bituminous surface, including cleaning the surface of all dirt, dust and other foreign matter, demarcation at site and traffic control				
	Directional arrows and lettering etc. (over 10cm width)	Sqm	1000.00	720.00 Rupees Seven Hundred Twenty Only	720,000.00 Rupees Seven Lakhs Twenty Thousand Only
8.09	Supplying and fixing sign boards complete as per Technical Specifications Clause 801. Including the cost of Posts, Fitting & fixing. Sheeting will be retro reflective type of high intensively grade and messages / boards and as per the direction of Engineer.				
(a)	Informatory Signs				
	(i) Facility Information (800 x 600)mm	No	56.00	3000.00 Rupees Three Thousand Only	168,000.00 Rupees One Lakh Sixty Eight Thousand Only
	(ii) Direction Signs (1200 x 700 mm)	No	62.00	6750.00 Rupees Six Thousand Seven Hundred Fifty Only	418,500.00 Rupees Four Lakhs Eighteen Thousand Five Hundred Only

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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
	(iii) Advance Direction (size 1800 x 1200mm) ,	No	7.00	13500.00 Rupees Thirteen Thousand Five Hundred Only	94,500.00 Rupees Ninety Four Thousand Five Hundred Only
	(iv) Re-Assurance Sign (1800 X 1200 mm) ,	No	7.00	13500.00 Rupees Thirteen Thousand Five Hundred Only	94,500.00 Rupees Ninety Four Thousand Five Hundred Only
	(v) Destination Sign (1500 X 900 mm) ,	No	7.00	8500.00 Rupees Eight Thousand Five Hundred Only	59,500.00 Rupees Fifty Nine Thousand Five Hundred Only
	(vi) Place Identification (1500 X 900 mm) ,	No	40.00	8500.00 Rupees Eight Thousand Five Hundred Only	340,000.00 Rupees Three Lakhs Forty Thousand Only
	(vii) Toll Booth (1500 X 900 mm)	No	4.00	8500.00 Rupees Eight Thousand Five Hundred Only	34,000.00 Rupees Thirty Four Thousand Only
	(viii) Bus Lane Sign (450mm x 600mm)	No	26.00	2500.00 Rupees Two Thousand Five Hundred Only	65,000.00 Rupees Sixty Five Thousand Only
	(ix) Other Informatory Signs (2100 x 1500mm)	No	2.00	20000.00 Rupees Twenty Thousand Only	40,000.00 Rupees Forty Thousand Only
(b)	Cautionary Signs triangular 900mm side	No	200.00	4500.00 Rupees Four Thousand Five Hundred Only	900,000.00 Rupees Nine Lakhs Only
(c)	Mandatory Signs				
	(i) Circular 600mm dia	No	70.00	3000.00 Rupees Three Thousand Only	210,000.00 Rupees Two Lakhs Ten Thousand Only
	(ii) Octagon 900 mm height	No	85.00	4500.00 Rupees Four Thousand Five Hundred Only	382,500.00 Rupees Three Lakhs Eighty Two Thousand Five Hundred Only
	(iii) Triangular 900 mm side	No	121.00	4500.00 Rupees Four Thousand Five Hundred Only	544,500.00 Rupees Five Lakhs Forty Four Thousand Five Hundred Only



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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
8.10	Providing & fixing retro - reflectorised road delineators complete as per drawing , Technical specifications clause 805 and as per the direction of Engineer.				
	(i) Roadway delineator	No	391.00	500.00 Rupees Five Hundred Only	195,500.00 Rupees One Lakh Ninety Five Thousand Five Hundred Only
	(ii) Hazard Marker	No	80.00	900.00 Rupees Nine Hundred Only	72,000.00 Rupees Seventy Two Thousand Only
	(iii) Object Marker	No	26.00	650.00 Rupees Six Hundred Fifty Only	16,900.00 Rupees Sixteen Thousand Nine Hundred Only
8.11	Providing and fixing precast RCC Guard post complete including end anchorage as per drawing and Technical Specifications Clause 806 and as per the direction of Engineer.	No.	1776.00	2200.00 Rupees Two Thousand Two Hundred Only	3,907,200.00 Rupees Thirty Nine Lakhs Seven Thousand Two Hundred Only
8.12	Providing and fixing of metal beam crash barrier including terminal anchorages made out of cold rolled steel strip W profile etc. complete as per drawing, Specifications and as directed by the Engineer.	LM	800.00	2700.00 Rupees Two Thousand Seven Hundred Only	2,160,000.00 Rupees Twenty One Lakhs Sixty Thousand Only
8.13	Providing and fixing Pedestrian guard rails in modules including painting with approved paint complete as per drawing and Technical Specification Clause 803,1008,1300 & 1700 direction of the Engineer.	LM	24900.00	2000.00 Rupees Two Thousand Only	49,800,000.00 Rupees Four Crores Ninety Eight Lakhs Only
8.14	Supply of colour video coverage in Digital format during construction as per Technical Specifications Clause 126 As per requirement and as per the direction of the Engineer.	Set	25.00	2500.00 Rupees Two Thousand Five Hundred Only	62,500.00 Rupees Sixty Two Thousand Five Hundred Only

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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
8.15	Providing rumble strips complete at required places as per drawing and as per the direction of Engineer.	No.	12.00	800.00 Rupees Eight Hundred Only	9,600.00 Rupees Nine Thousand Six Hundred Only
8.16	Providing road hump complete at required places as per drawing and as per the direction of Engineer.	No.	39.00	1500.00 Rupees One Thousand Five Hundred Only	58,500.00 Rupees Fifty Eight Thousand Five Hundred Only
8.17	Providing toll plaza as per drawing and technical specification and as per the direction of Engineer.	No.	1.00	7500000.00 Rupees Seventy Five Lakhs Only	7,500,000.00 Rupees Seventy Five Lakhs Only
8.18	Providing and fixing of bi-directional retro reflective raised pavement markers of approved colour, quality & make conforming to ASTM D-4280 as per approved drawing etc. complete as per the technical specifications and direction of Engineer.	No	10580.00	1250.00 Rupees One Thousand Two Hundred Fifty Only	13,225,000.00 Rupees One Crore Thirty Two Lakhs Twenty Five Thousand Only
8.19	Supplying, erecting and commissioning 100kVA diesel powered generator of approved make for Toll Plaza at required place as per the direction & approval of Engineer including cost of all labour, transportation, taxes, duties etc. complete.	No	1.00	1000000.00 Rupees Ten Lakhs Only	1,000,000.00 Rupees Ten Lakhs Only
Total for Bill No.8 Carried forward to Summary					109,154,110.00
					Rupees Ten Crores Ninety One Lakhs Fifty Four Thousand One Hundred Ten Only



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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
BILL NO.9 MAINTENANCE, REPAIR AND REHABILITATION					
9.01	Restoration of Rain Cuts (Restoration of rain cuts with soil, moorum, gravel or a mixture of these, clearing the loose soil, benching for 300 mm width, laying fresh material in layers not exceeding 250 mm and compacting with plate compactor or power rammers to restore the original alignment, levels and slopes)	Cum	297.00	350.00 Rupees Three Hundred Fifty Only	103,950.00 Rupees One Lakh Three Thousand Nine Hundred Fifty Only
9.02	Maintenance of Earthen Shoulder (filling with fresh soil) (Making up loss of material/ irregularities on shoulder to the design level by adding fresh approved soil and compacting it with appropriate equipment.)	Sqm	13200.00	25.00 Rupees Twenty Five Only	330,000.00 Rupees Three Lakhs Thirty Thousand Only
9.03	Maintenance of Earth Shoulder (stripping excess soil) (Stripping excess soil from the shoulder surface to achieve the approved level and compacting with plate compactor)	Sqm	13200.00	15.00 Rupees Fifteen Only	198,000.00 Rupees One Lakh Ninety Eight Thousand Only
9.04	Filling Pot- holes and Patch Repairs with open - graded Premix surfacing, 20mm. (Removal of all failed material, trimming of completed excavation to provide firm vertical faces, cleaning of surface, painting of tack coat on the sides and base of excavation as per clause 503, back filling the pot holes with hot bituminous material as per clause 511, compacting, trimming and finishing the surface to form a smooth continuous surface, all as per clause 3004.2)	Sqm	24255.00	300.00 Rupees Three Hundred Only	7,276,500.00 Rupees Seventy Two Lakhs Seventy Six Thousand Five Hundred Only
9.05	Epoxy bonding of new concrete to old concrete for jacketing as Technical Specification clause 2805 and as per the direction of Engineer.	Sqm	3934.00	2000.00 Rupees Two Thousand Only	7,868,000.00 Rupees Seventy Eight Lakhs Sixty Eight Thousand Only
Total for Bill No.9 Carried forward to Summary					15,776,450.00 Rupees One Crore Fifty Seven Lakhs Seventy Six Thousand Four Hundred Fifty Only



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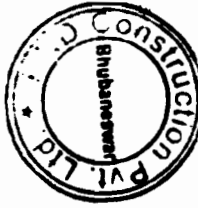
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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
BILL NO.10 ENVIRONMENTAL MITIGATION MEASURES					
10.01	Earthwork in excavation in all kinds of soil of foundation for structures complete as per drawing no. OSRP/CEG/SH/ENV/1A,B,C,03,04-A,B,05-A,09,10 and Major Junction and technical specifications clause 304 including all leads and lifts	Cum	5753.00	66.00 Rupees Sixty Six Only	379,698.00 Rupees Three Lakhs Seventy Nine Thousand Six Hundred Ninety Eight Only
10.02	Filling sand below foundations for structures complete as per drawing no. OSRP/CEG/CDJN,09 and technical specifications clause 304 including all leads and lifts	Cum	4728.00	250.00 Rupees Two Hundred Fifty Only	1,182,000.00 Rupees Eleven Lakhs Eighty Two Thousand Only
10.03	Providing & laying in position Cement Concrete M-15 grade in foundation, levelling course etc. including centering and shuttering all complete as per drawing no. OSRP/CEG/SH/ENV/1A,B,C,03,04-A,B,05-A,09,10, Major Jns and Technical Specification Sections 1500 and 1700.	Cum	3009.00	3310.00 Rupees Three Thousand Three Hundred Ten Only	9,959,790.00 Rupees Ninety Nine Lakhs Fifty Nine Thousand Seven Hundred Ninety Only
10.04	Providing and laying in position PCC M-20 grade in (in kerbs) as per drawing no. OSRP/CEG/SH/ENV/01A,B,C and technical specifications clause 408 and section 1700 and direction of Engineer.	Cum	5459.00	391.00 Rupees Three Hundred Ninety One Only	2,134,469.00 Rupees Twenty One Lakhs Thirty Four Thousand Four Hundred Sixty Nine Only
10.05	Providing & laying in position Cement Concrete M-20 grade in foundation, levelling course etc. including centering and shuttering all complete as per drawing no. OSRP/CEG/SH/ENV/1A,B,C,09, Major Jns and Technical Specification Sections 1500 and 1700.	Cum	341.00	4183.00 Rupees Four Thousand One Hundred Eighty Three Only	1,426,403.00 Rupees Fourteen Lakhs Twenty Six Thousand Four Hundred Three Only



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World Bank Projects, Odisha
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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
10.06	Providing & laying in position Reinceford Cement Concrete M-20 grade in foundation, levelling course etc. including centering and shuttering all complete as per drawing no. OSRP/CEG/SH/ENV/04-A,B,05,5-A,10, Major Jns and Technical Specification Sections 1500 and 1700.	Cum	1219.00	4183.00 Rupees Four Thousand One Hundred Eighty Three Only	5,099,077.00 Rupees Fifty Lakhs Ninety Nine Thousand Seventy Seven Only
10.07	Providing & laying in position HYSD bars reinforcement bars with cutting, bending, binding, laying in position including cost of binding wires complete as per technical spection clause 1600 and direction of Engineer.	MT	61.00	61265.00 Rupees Sixty One Thousand Two Hundred Sixty Five Only	3,737,165.00 Rupees Thirty Seven Lakhs Thirty Seven Thousand One Hundred Sixty Five Only
10.08	Supplying and fixing of MS Grill Gates at schools/ Government Buildings including cost of enamel painting two coats over a coat of red oxide as per drawing no OSRP/CEG/SH/ENV/05A as per technical spections on building items and direction of Engineer.	Kg	5470.00	71.00 Rupees Seventy One Only	388,370.00 Rupees Three Lakhs Eighty Eight Thousand Three Hundred Seventy Only
10.09	Supplying and fixing of MS ISA 7575 of 5mm thick angle posts, split 70mm at botton end including cost of enamel painting two coats over a coat of red oxide to be fixed vertically in position in concrete and holes drilled drilled in it @ 150mm C/C as per drawing no OSRP/CEG/SH/ENV/04B,5 as per technical spections on building items and direction of Engineer.	Kg	5520.00	71.00 Rupees Seventy One Only	391,920.00 Rupees Three Lakhs Ninety One Thousand Nine Hundred Twenty Only
10.10	Providing and GI barbed wire twisted with 2 wires of 2.5mm dia @ including cost of material, labour all complete as per drawing No. OSRP/CEG/SH/ENV/04B,5 as per technical spections on building items and direction of Engineer.	Kg	484.00	55.00 Rupees Fifty Five Only	26,620.00 Rupees Twenty Six Thousand Six Hundred Twenty Only
10.11	Providing and laying Boulder apron with HG boulder at spilling locations as per technical specification clause 2506 and as per drawing no.OSRP/CEG/SH/ENV/10 and direction of Engineer.	Cum	154.00	950.00 Rupees Nine Hundred Fifty Only	146,300.00 Rupees One Lakh Forty Six Thousand Three Hundred Only



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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
10.12	Constructing course rubble hard granite stone masonry in C.M 1:3 (at bathing ghat) as per technical specification cl. No. 1400, 2200 as per Drawing No. OSRP/CEG/SH/ENV/09 and as per the direction of Engineer.	Cum	548.00	2500.00 Rupees Two Thousand Five Hundred Only	1,370,000.00 Rupees Thirteen Lakhs Seventy Thousand Only
10.13	Providing and laying filter material under neath the pitching in slopes at water bodies and ponds as per technical specification clause 2500, drawing no.OSRP/CEG/SH/ENV/3 and direction of Engineer	Cum	1201.00	550.00 Rupees Five Hundred Fifty Only	660,550.00 Rupees Six Lakhs Sixty Thousand Five Hundred Fifty Only
10.14	Providing and laying pitching on slopes over filter material at water bodies and ponds as per technical specification clause 2500, drawing no.OSRP/CEG/SH/ENV/3 and direction of Engineer.	Cum	1601.00	990.00 Rupees Nine Hundred Ninety Only	1,584,990.00 Rupees Fifteen Lakhs Eighty Four Thousand Nine Hundred Ninety Only
10.15	Providing cement pointing to CRHG stone masonry 20mm thick with CM(1:3) for side wlls at bathing Ghats locations as per drawing no. OSRP/CEG/SH/ENV/9 and as per direction of Engineer.	Sqm	702.00	15.00 Rupees Fifteen Only	10,530.00 Rupees Ten Thousand Five Hundred Thirty Only
10.16	Providing and fixing fixed flower vase of bottom(150x150), top (400x400) of depth 300mm as per drawing no OSRP/CEG/SH/ENV/4A and as per direction of Engineer.	Nos	252.00	250.00 Rupees Two Hundred Fifty Only	63,000.00 Rupees Sixty Three Thousand Only
10.17	Construction of approach road with GSB and moorum topping well mixed and compacted as hard sholder as per technical spection clause 400.2 drawing no OSRP/CEG/SH/ENV/05 and as per direction of Engineer.	LM	300.00	2500.00 Rupees Two Thousand Five Hundred Only	750,000.00 Rupees Seven Lakhs Fifty Thousand Only
10.18	Providing cement paint two coats to the walls as per drawing no. OSRP/CEG/SH/ENV/03, 04-A, B, 05, 05A, 10 as per direction of Engineer.	Sqm	6494.00	35.00 Rupees Thirty Five Only	227,290.00 Rupees Two Lakhs Twenty Seven Thousand Two Hundred Ninety Only



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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
10.19	Maintenance of haulage road for 4 occurrences through out the construction period as per technical specification cl.no.3002 and as per the direction of Engineer.	Cum	22500.00	110.00 Rupees One Hundred Ten Only	2,475,000.00 Rupees Twenty Four Lakhs Seventy Five Thousand Only
10.20	Providing and placing RCC M-20 Garbage collection bins of internal dia 1.0m and 75mm thick of 1.0M height at commercial locations and as per the direction of Engineer.	Nos	30.00	4200.00 Rupees Four Thousand Two Hundred Only	126,000.00 Rupees One Lakh Twenty Six Thousand Only
10.21	Stripping of top soil from borrow areas located in agriculture fields, storing at a suitable place, spreading and re-laying after taking the borrow earth to maintain fertility of the agricultural field, finishing it to the required levels and satisfaction of the farmer etc. complete as per the direction of Engineer.	Cum	5000.00	30.00 Rupees Thirty Only	150,000.00 Rupees One Lakh Fifty Thousand Only
				Sub-Total Bill No. 10	32,289,172.00
					Rupees Three Crores Twenty Two Lakhs Eighty Nine Thousand One Hundred Seventy Two Only

World Bank Projects,
EMPLOYER

Chief Engineer
World Bank Project

Chief Engineer
World Bank Project
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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
Schedule of Daywork Rates: 1. Labour					
D101	Labour (Un-skilled)	Day	400.00	150.00 Rupees One Hundred Fifty Only	60,000.00 Rupees Sixty Thousand Only
D102	Mason (Special)	Day	50.00	300.00 Rupees Three Hundred Only	15,000.00 Rupees Fifteen Thousand Only
D103	Carpenter (Special)	Day	20.00	300.00 Rupees Three Hundred Only	6,000.00 Rupees Six Thousand Only
D104	Steelworker Erector	Day	70.00	300.00 Rupees Three Hundred Only	21,000.00 Rupees Twenty One Thousand Only
D105	Driver for vehicle up to 10 tons	Day	50.00	300.00 Rupees Three Hundred Only	15,000.00 Rupees Fifteen Thousand Only
D106	Operator for excavator, dragline, shovel or crane	Day	50.00	300.00 Rupees Three Hundred Only	15,000.00 Rupees Fifteen Thousand Only
D107	Operator for tractor with dozer blade or ripper	Day	50.00	300.00 Rupees Three Hundred Only	15,000.00 Rupees Fifteen Thousand Only
D108	Operator grader	Day	50.00	300.00 Rupees Three Hundred Only	15,000.00 Rupees Fifteen Thousand Only
D109	Operator in other construction equipment	Day	50.00	300.00 Rupees Three Hundred Only	15,000.00 Rupees Fifteen Thousand Only

Berhampur - Taptapani (Balance Work)



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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
D110	Chowkidars for watch & ward	Day	500.00	300.00 Rupees Three Hundred Only	150,000.00 Rupees One Lakh Fifty Thousand Only
Total					327,000.00 Rupees Three Lakhs Twenty Seven Thousand Only
D111	Allow Nil percent of Subtotal for Contractor's overhead, profit, etc., in accordance with paragraph 3 (b) above			0.00%	-
Total					327,000.00 Rupees Three Lakhs Twenty Seven Thousand Only

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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
Schedule of Daywork Rates: 2. Materials					
D201	Cement, ordinary Portland or equivalent in bags conforming to IS:269:1989 and IS 455:1989	Per Mt	20.00	6000.00 Rupees Six Thousand Only	120,000.00 Rupees One Lakh Twenty Thousand Only
D202	HYSD reinforcing bars upto 25 mm dia conforming to IS:1786:1989	Per Mt	5.00	60000.00 Rupees Sixty Thousand Only	300,000.00 Rupees Three Lakhs Only
D203	Bricks of class designation 75 as per IS:1077:1992	Per 1000 Nos	500.00	5000.00 Rupees Five Thousand Only	2,500,000.00 Rupees Twenty Five Lakhs Only
D204	Anti Corrosive Bituminous paint	Per Lit	10.00	100.00 Rupees One Hundred Only	1,000.00 Rupees One Thousand Only
D205	Enamel Paint of any shade & colour (IS:2932-1964 & IS 137-1975)	Per Lit	10.00	110.00 Rupees One Hundred Ten Only	1,100.00 Rupees One Thousand One Hundred Only
D206	Coarse Sand as per IS 1542	Per Cum	50.00	500.00 Rupees Five Hundred Only	25,000.00 Rupees Twenty Five Thousand Only
D207	R.R. Stone for masonry	Per Cum	50.00	1000.00 Rupees One Thousand Only	50,000.00 Rupees Fifty Thousand Only
D208	Crusher broken stone aggregates up to 25 mm nominal size	Per Cum	50.00	1000.00 Rupees One Thousand Only	50,000.00 Rupees Fifty Thousand Only
D209	Crusher broken stone aggregates Above 25 mm nominal size	Per Cum	50.00	900.00 Rupees Nine Hundred Only	45,000.00 Rupees Forty Five Thousand Only
D210	Portable water at site	Per 1000 ltr	5000.00	500.00	2,500,000.00



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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
				Rupees Five Hundred Only	Rupees Twenty Five Lakhs Only
D211	Gravel/ Moorum for Road Work	Per Cum	50.00	300.00 Rupees Three Hundred Only	15,000.00 Rupees Fifteen Thousand Only
D212	Bitumen-VG-30	Per Mt	5.00	45000.00 Rupees Forty Five Thousand Only	225,000.00 Rupees Two Lakhs Twenty Five Thousand Only
					5,832,100.00
					Rupees Fifty Eight Lakhs Thirty Two Thousand One Hundred Only
D213	Allow Nil percent of Subtotal for Contractor's overhead, profit, etc., in accordance with paragraph 3 (b) above			0.00%	-
					5,832,100.00
					Rupees Fifty Eight Lakhs Thirty Two Thousand One Hundred Only

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Chief Engineer
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CHANDAN KUMAR
World Bank Project
O/o the E.I.C.(Civil), Odisha
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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
Schedule of Daywork Rates: 3. Contractor's Equipment					
D301 Excavator, face shovel, or dragging:					
D301.1	Up to and including 1 m ³	Hour	50.00	1200.00 Rupees One Thousand Two Hundred Only	60,000.00 Rupees Sixty Thousand Only
D301.2	Over 1 m ³ to 2 m ³	Hour	30.00	2200.00 Rupees Two Thousand Two Hundred Only	66,000.00 Rupees Sixty Six Thousand Only
D301.3	Over 2 m ³	Hour	10.00	3000.00 Rupees Three Thousand Only	30,000.00 Rupees Thirty Thousand Only
D302 Tractor, including bull or angle dozer:					
D302.1	Up to and including 150 kW	Hour	50.00	100.00 Rupees One Hundred Only	5,000.00 Rupees Five Thousand Only
D302.2	Over 150 kW to 200 kW	Hour	30.00	200.00 Rupees Two Hundred Only	6,000.00 Rupees Six Thousand Only
D302.3	Over 200 kW to 250 kW	Hour	10.00	250.00 Rupees Two Hundred Fifty Only	2,500.00 Rupees Two Thousand Five Hundred Only
D303 Tractor with ripper:					
D303.1	Up to and including 200 kW	Hour	30.00	500.00 Rupees Five Hundred Only	15,000.00 Rupees Fifteen Thousand Only
D303.2	Over 200 kW to 250 kW	Hour	10.00	600.00 Rupees Six Hundred Only	6,000.00 Rupees Six Thousand Only
D304	Motor grader	Hour	40.00	1000.00 Rupees One Thousand Only	40,000.00 Rupees Forty Thousand Only
D305	Crane- 5 tonne	Hour	40.00	500.00 Rupees Five Hundred Only	20,000.00 Rupees Twenty Thousand Only
D306	Diesel Road Roller, or Vibratory Compactor upto 10 t	Hour	40.00	200.00 Rupees Two Hundred Only	8,000.00 Rupees Eight Thousand Only



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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
D307	Trucks, or Truck tipper, or Truck with mounted water tank or truck with crane for removal of accidental vehicles.	Hour	100.00	150.00 Rupees One Hundred Fifty Only	15,000.00 Rupees Fifteen Thousand Only
D308 Tractor with trolley, or tractor with water tanker trailer, tractor with ripper Tractor with hydraulic scraper					
	(a) upto 25 HP	Hour	40.00	100.00 Rupees One Hundred Only	4,000.00 Rupees Four Thousand Only
	(b) For 25-40 HP	Hour	30.00	100.00 Rupees One Hundred Only	3,000.00 Rupees Three Thousand Only
D309	Bitumen mixture (10-14 Cft.) C.C	Hour	20.00	100.00 Rupees One Hundred Only	2,000.00 Rupees Two Thousand Only
D310 Water pumping sets mounted on trolley (diesel driven)with inlet & outlet pipes.					
	a) Sets up to 10 HP	Hour	10.00	50.00 Rupees Fifty Only	500.00 Rupees Five Hundred Only
	b) Sets 11 to 20 HP	Hour	10.00	60.00 Rupees Sixty Only	600.00 Rupees Six Hundred Only
	c) Sets above 20 HP	Hour	10.00	70.00 Rupees Seventy Only	700.00 Rupees Seven Hundred Only
D311 Generator sets mounted on trolley					
	a) Sets upto 5 Kva	Hour	10.00	10.00 Rupees Ten Only	100.00 Rupees One Hundred Only
	b) Sets 5-15 Kva	Hour	10.00	20.00 Rupees Twenty Only	200.00 Rupees Two Hundred Only
D312	Mobile Crane / Power winch	Hour	10.00	100.00 Rupees One Hundred Only	1,000.00 Rupees One Thousand Only
D313	Bull Dozer 100/110 Hp	Hour	10.00	1000.00 Rupees One Thousand Only	10,000.00 Rupees Ten Thousand Only
D314	Plate compactors	Hour	10.00	20.00 Rupees Twenty Only	200.00 Rupees Two Hundred Only
D315	Jack hammers for dismantling	Hour	10.00	10.00 Rupees Ten Only	100.00 Rupees One Hundred Only
D316	Utility Vehicles	Hour	10.00	50.00 Rupees Fifty Only	500.00 Rupees Five Hundred Only



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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
D317	Mini Hot Mix Plant (5TPH)	Hour	10.00	500.00 Rupees Five Hundred Only	5,000.00 Rupees Five Thousand Only
					301,400.00
					Rupees Three Lakhs One Thousand Four Hundred Only
D318	Allow Nil percent of Subtotal for Contractor's overhead, profit, etc., in accordance with paragraph 3 (b) above			0.00%	-
					301,400.00
					Rupees Three Lakhs One Thousand Four Hundred Only

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Daywork Summary

Contract Name: Widening and Strengthening of Existing Carriageway to 2 lane from
Berhampur - Taptapani (0/0 km to 41/0 km of SH-17)(Balance Work)
- NCB Package OSRP-Bal-03


Contract No.: Agreement No. of 2012 - 13

	Amount (Rs.)	% Foreign
1. Total for Daywork: Labour	327,000.00	NIL
2. Total for Daywork: Materials	5,832,100.00	NIL
3. Total for Daywork: Contractor's Equipment	301,400.00	NIL
Total for Daywork (Provisional Sum)	6,460,500.00	

(carried forward to Bid Summary, p-1)


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Balance work for Berhampur to Taptapani (Km. 0/0 to 41/0 of SH - 17)

Description	Rate	Unit	Qty	2013												2014						2015		Total															
				MS1	MS2	MS3	MS4	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun				Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb					
... and grubbing for road land complete as per drawing and Technical Specification Clause 201 and as per the direction of Engineer-in-charge	24000.00	Hectare	48	10.9	11.4	11.2	12.8	2.7	2.5	2.8	3.1				3.8	3.8	3.8	3.73984	3.73984	3.73984	3.11341	3.11341	3.11341			2.49634										46.0	0.0		
... structures and pavement including ... of retaining material and/or salvaging ... materials complete as per Technical Specification Clause 202, 203 and as per the direction of Engineer-in-charge																																						0.0	0.0
a) Stone Structures of dry or in ...	130	Cum	2959	709.5	748.1	731.5	811.9	177.4	177.4	177.4	177.4				186.523	186.523	186.523	186.523	182.866	182.866	182.866	202.981	202.981	202.981												2959.0	0.0		
b) Structures of concrete/ Prestressed concrete ... including cleaning ... and separating ... from RCC/PC for Sand Coffers & Bowchairs and Bridges				0.0	0.0	0.0	0.0	0.0	0.0																													0.0	0.0
... of ...	300	Cum	1059	269.1	272.4	267.1	296.5	129.5	129.5	126.2	136.2	133.5	133.5	98.8	98.8	98.8																						1095.0	0.0
... of ...	425	Cum	3121	738.4	776.4	781.2	845.0	385.2	385.2	388.2	388.2	380.6	380.6	281.7	281.7	281.7																						3121.0	0.0
c) Dismantling of all type of Pavement course	180	Cum	100	23.7	24.9	24.4	27.1	11.8	11.8	12.4	12.4	12.2	12.2	9.0	9.0	9.0																						100.0	0.0
d) ...	180	Lm	484	114.9	120.4	118.0	131.0	57.3	57.3	60.2	60.2	59.0	59.0	43.7	43.7	43.7																						484.0	0.0
e) ...	15	Lm	60	14.2	14.9	14.6	16.2	7.1	7.1	7.5	7.5	7.3	7.3	5.4	5.4	5.4																						60.0	0.0
f) Dry stone pitching	175	Cum	51	12.1	12.7	12.4	13.8	5.0	5.0	5.3	5.3	5.2	5.2	4.6	4.6	4.6																						51.0	0.0
g) RCC railing	45	Lm	272	84.4	87.7	86.9	93.6	32.2	32.2	33.8	33.8	32.2	32.2	24.5	24.5	24.5																						272.0	0.0
h) Expansion joint	500	Lm	138	32.6	34.3	33.7	37.4	15.3	15.3	16.2	16.2	15.8	15.8	12.5	12.5	12.5																						138.0	0.0
i) Wearning coat				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																					0.0	0.0	
j) Bituminous concrete	300	Sqm	271	64.1	67.4	66.1	73.4	32.1	32.1	33.7	33.7	33.0	33.0	24.5	24.5	24.5																						271.0	0.0
... Roadway excavation including removal of unsuitable soil necessary for construction of roadway complete as per drawing and Technical Specification Clause 301 and as per the direction of Engineer-in-charge				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																						0.0	0.0
a) All kinds of soil	70	Cum	266156	38102.5	46141.2	42098.2	91914.0	3025.63	3025.63	3025.63	3025.63	3025.63	15380.4	15380.4	15380.4	30559.4	30559.4	30559.4	22978.5	22978.5	22978.5	22978.5	22978.5	22978.5													266156.0	0.0	
b) Soft rock (bearing not required) (LS)	160	Cum	1000	139.8	173.9	345.9	345.2	33.8983	33.8983	33.8983	33.8983					37.7655	37.7655	37.7655	115.3	115.3	115.3	86.3023	86.3023	86.3023														1000.0	0.0
c) Hard rock (bearing not required) (LS)	350	Cum	356	129.8	165.7	330.7	330.0	32.4068	32.4068	32.4068	32.4068					59.2281	59.2281	59.2281	110.227	110.227	110.227	82.505	82.505	82.505													356.0	0.0	
d) Hard rock (bearing not required) (LS)	400	Cum	1000	139.8	173.9	345.9	345.2	33.8983	33.8983	33.8983	33.8983					57.7655	57.7655	57.7655	115.3	115.3	115.3	86.3023	86.3023	86.3023														1000.0	0.0
Construction of embankment with approved material from approved borrow area as per drawing and Technical Specification Clause 305 and as per the direction of Engineer-in-charge	150	Cum	48977	6640.9	8487.8	16941.2	16907.3	1660.24	1660.24	1660.24	1660.24				2829.18	2829.18	2829.18	5647.07	5647.07	5647.07	4226.83	4226.83	4226.83														48977.0	0.0	
Construction of subgrade and earthen shoulder with approved material as per drawing and Technical Specification Clause 305 and as per the direction of Engineer-in-charge	175	Cum	291101	39471.3	50446.8	100692.1	100490.8			9867.83	9867.83	9867.83	9867.83		12611.7	12611.7	12611.7	12611.7	25173	25173	25173	25173	25122.7	25122.7														291101.0	0.0
Construction of embankment and subgrade with suitable material deposited at site from roadway and drainage excavation all complete as per drawing and Technical Specification Clause 305 and as per the direction of Engineer-in-charge	75	Cum	54728	7420.7	9484.2	18930.5	18932.8			1855.19	1855.19	1855.19	1855.19		2371.04	2371.04	2371.04	2371.04	4732.82	4732.82	4732.82	4732.82	4732.82	4732.82														54728.0	0.0
Loosening and recompacting the existing subgrade in all kinds of soil to a depth of 300mm/500mm to meet the requirement of table 300-2 complete as per Technical Specification Clause 305 and as per the direction of Engineer-in-charge	20	Cum	35375	4796.8	6130.4	12238.3	12211.8			1199.15	1199.15	1199.15	1199.15		1532.59	1532.59	1532.59	1532.59	3059.06	3059.06	3059.06	3059.06	3059.06	3059.06														35375.0	0.0
Earthwork with agriculture soil for filling of median/road complete as per Technical Specification Clause 407 and as per the direction of Engineer-in-charge	110	Cum	1620	219.7	280.7	560.4	559.2												109.831	109.831																	1620.0	0.0	
Scarifying the existing bituminous surface layers without disturbing the base including carrying, processing, laying and disposal of waste material complete as per Technical Specification Clause 501 and as per the direction of Engineer-in-charge	15	Sqm	72488	9828.9	12961.9	25073.7	25023.5			3276.29	3276.29	3276.29			3140.48	3140.48	3140.48	3140.48	6268.42	6268.42	6268.42	6268.42	6268.42	6268.42													72488.0	0.0	
Spreading, storing of top soil by road side at 15% excess and replacement on embankment, road cut slopes and other areas in localities where the available embankment materials not conducive to plant growth as directed by the Engineer-in-charge as per Technical Specification 301	80	Cum	13855	1878.8	2401.0	4792.5	4782.9			626.215	626.215	626.215			600.256	600.256	600.256	600.256	1198.11	1198.11	1198.11	1198.11	1198.11	1198.11													13855.0	0.0	
... IN THE CASE OF SUB-BASE AND BASE ...																																						0.0	0.0
... of Granular Sub-base course by ... naturally occurring ... in combination thereof ... complete as per Technical Specification clause 401 and as per the direction of Engineer-in-charge	1350	Cum	90353	18574.7	14735.2	27396.3	29642.8			3714.94	3714.94	3714.94	3714.94		2947.84	2947.84	2947.84	2947.84	6849.08	6849.08	6849.08	6849.08	6849.08	6849.08														90353.0	0.0



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Description	Rate	Unit	Qty	MS				2013												2014												2015												Total		
				MS1	MS2	MS3	MS4	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb															
Excavating and filling foundation and at the back of wing wall and return wall etc. and concrete in layers not exceeding 150mm thickness all works & etc as per technical specification Clause 304 and as per the direction of Engineer-in-charge	210	Cum	1994		1102.22	220.4444	661.3333				275.556	275.556	275.556	275.556					55.1111	55.1111	55.1111	55.1111			165.333	165.333	165.333	165.333							1984.0	0.0										
Providing and fixing media behind abutment, wing wall and return wall complete as per drawing and technical specification clause 304 and as per the direction of Engineer-in-charge	650	Cum	135		75	15	45				25.0	25.0	25.0							5.0	5.0	5.0					15.0	15.0	15.0						0.0	0.0										
Provide concrete M-15 grade in wearing course etc including centering and shuttering all complete as per drawing and Technical Specification Section 1500, 1700 and 2200 and as per the direction of Engineer-in-charge	3500	Cum	333		185	37	111				61.6667	61.6667	61.6667							12.3333	12.3333	12.3333					37	37	37						0.0	0.0										
Provide concrete M-10 grade in foundation and substructure etc including centering and shuttering all complete as per drawing and Technical specification Section 1500, 1700, 2100, 2200 and as per the direction of Engineer-in-charge	3500	Cum	768		426.267	85.3333	256				105.667	106.667	106.667	106.667						21.3333	21.3333	21.3333	21.3333			54	54	54	54						0.0	0.0										
Reinforced cement concrete in foundation complete as per drawing & Technical specification sections 1500, 1700, 2100, 2200 and as per the direction of Engineer-in-charge																																			0.0	0.0										
Reinforced cement concrete in foundation complete as per drawing & Technical specification sections 1500, 1700, 2100, 2200 and as per the direction of Engineer-in-charge																																			0.0	0.0										
a) M-20 Grade	4000	Cum	667		370.556	74.1111	222.3333				123.519	123.519	123.519							24.7037	24.7037	24.7037					74.1111	74.1111	74.1111						667.0	0.0										
b) M-35 Grade		Cum	0																																0.0	0.0										
Reinforced cement concrete in substructure complete as per drawing & Technical specification sections 1500, 1700, 2200 and as per the direction of Engineer-in-charge																																			0.0	0.0										
a) M-20 Grade	4500	Cum	1189		600.556	132.1111	396.3333				220.185	220.185	220.185							44.037	44.037	44.037					132.111	132.111	132.111						1189.0	0.0										
b) M-30 Grade		Cum	0																																0.0	0.0										
c) M-35 Grade		Cum	0																																0.0	0.0										
Reinforced cement concrete in super structure complete as per drawing and Technical specification section 1500, 1700, 2200 and as per the direction of Engineer-in-charge																																			0.0	0.0										
a) M-25 grade	5000	Cum	149		87.778	16.5556	49.6667				27.5926	27.5926	27.5926							5.51852	5.51852	5.51852					16.5556	16.5556	16.5556						149.0	0.0										
b) M-30 grade	5200	Cum	1772		964.444	196.8889	590.6667				328.148	328.148	328.148							65.6296	65.6296	65.6296					196.889	196.889	196.889						1772.0	0.0										
Reinforced concrete in super structure complete as per drawing and technical specifications clause 1500 and as per the direction of Engineer-in-charge																																			0.0	0.0										
a) in foundation	62000	MT	39		21.8667	4.33333	131				7.22222	7.22222	7.22222							1.44444	1.44444	1.44444					4.33333	4.33333	4.33333						39.0	0.0										
b) in substructure	62000	MT	119		66.1111	13.22222	65.66667				16.5278	16.5278	16.5278							3.30556	3.30556	3.30556					9.91667	9.91667	9.91667						119.0	0.0										
c) in superstructure	62000	MT	202		112.222	22.44444	87.33333				37.4074	37.4074	37.4074							7.48148	7.48148	7.48148					22.4444	22.4444	22.4444						202.0	0.0										
Providing and fixing specified bearings complete as per Drawing and technical specification 2000 and as per the direction of Engineer-in-charge																																			0.0	0.0										
a) Elastomeric bearing		Cum	0																																0.0	0.0										
b) Tapered bearing	275	Sqm	246		136.667	27.33333	82				45.5556	45.5556	45.5556							9.11111	9.11111	9.11111					27.3333	27.3333	27.3333						246.0	0.0										
Reinforced cement concrete M-30 grade for approach slab complete as per Drawing and Technical specification section 1500, 1600, 1700, 2700 and as per the direction of Engineer-in-charge	1000	Cum	191		106.111	21.2222	63.66667							106.111														21.2222							63.6667	191.0	0.0									
Bituminous wearing course 50mm thick comprising 50mm thick asphaltic Concrete in a single layer over Bituminous mastic course 6 mm thick with a prime Coat Complete as per drawing and Technical Specification Section 509 and 2700 and as per the direction of Engineer-in-charge	625	Sqm	1258		698.889	139.778	419.3333							698.889														139.778							419.333	1258.0	0.0									
Providing and fixing Drainage Spouts Complete as per drawing and Technical Specification Clause 2705 and as per the direction of Engineer-in-charge	2200	No	32		17.7778	3.55556	10.66667						5.92593	5.92593	5.92593													1.8519	1.8519	1.8519						0.0	0.0									
Providing and laying Stone pitching in slopes complete as per drawing and Technical Specification Section 2500 and as per the direction of Engineer-in-charge	900	Cum	137		78.1111	15.22222	45.66667																					15.2222							45.6667	137.0	0.0									
																																				0.0	0.0									

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Bhubaneswar

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Bhubaneswar

Name of Project - **BALANCE WORK FOR BERHAMPUR TO TAPTAPANI**
 from Berhampur to Taptapani (Km. 0/0 to 4/0 of SH - 17)
 Name of Contractor - **RKD Construction Pvt. Ltd**
 Name of Consultant - **Matheson Stephen Valuations**

BERHAMPUR - TAPTAPANI, SH-17

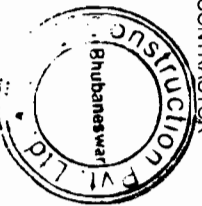
BOQ ITEM NO: 2.01

ITEM OF WORK: EXCAVATION

MONTH WISE & SECTION WISE QUANTITY

SECTION	SECTION WISE QUANTITY IN CUM				TOTAL QUANTITY	CUMULVE QUANTITY
	I	II	III	IV		
SI	MONTH					
1	Mar-13	9125.831			9,126	9,126
2	Apr-13	9125.831			9,126	18,252
3	May-13	9125.831			9,126	27,377
4	Jun-13	9125.831			9,126	36,503
5	Jul-13	0.000			-	36,503
6	Aug-13	0.000			-	36,503
7	Sep-13	0.000			-	36,503
8	Oct-13		15551.160		15,551	52,054
9	Nov-13		15551.160		15,551	67,606
10	Dec-13		15551.160		15,551	83,157
11	Jan-14		31040.240		31,040	114,197
12	Feb-14		31040.240		31,040	145,237
13	Mar-14		31040.240		31,040	176,278
14	Apr-14			23233.620	23,234	199,511
15	May-14			23233.620	23,234	222,745
16	Jun-14			23233.620	23,234	245,978
17	Jul-14			0.000	-	245,978
18	Aug-14				-	245,978
19	Sep-14				-	245,978
20	Oct-14			23233.620	23,234	269,212
21	Nov-14				-	269,212
22	Dec-14				-	269,212
23	Jan-15				-	269,212
24	Feb-15				-	269,212
	TOTAL	36503.322	46653.480	93120.719	92934.678	269212.000

M/s RKD Construction Pvt. Ltd
 CONTRACTOR



World Bank

Chief Engineer
 Projects, Odisha
 EMPOWER
 World Bank Project
 O/o the E.I.C.(Civil), Odisha
 Bhubaneswar.

Name of Project - BALANCE WORK FOR BERHAMPUR TO TAPTAPANI
 from Berhampur to Taptapani (Km. 0/0 to 4/0 of SH - 17)
 Name of Contractor - RKD Construction Pvt. Ltd.
 Name of Consultant - Matheson Stephen Valuations

BERHAMPUR - TAPTAPANI, SH-17

BOQITEM NO.1.01

ITEM OF WORK: C & G

MONTH WISE & SECTION WISE QUANTITY

SI	MONTH	SECTION WISE QUANTITY IN CUM				TOTAL QUANTITY	CUMULVE QUANTITY
		I	II	III	IV		
1	Mar-13	2721				2.7	2.7
2	Apr-13	2861				2.9	5.6
3	May-13	2805				2.8	8.4
4	Jun-13	3113				3.1	11.5
5	Jul-13	0.000				-	11.5
6	Aug-13					-	11.5
7	Sep-13					-	11.5
8	Oct-13		3815			3.8	15.3
9	Nov-13		3815			3.8	19.1
10	Dec-13		3815			3.8	22.9
11	Jan-14			3740		3.7	26.7
12	Feb-14			3740		3.7	30.4
13	Mar-14			3740		3.7	34.2
14	Apr-14				3113	3.1	37.3
15	May-14				3113	3.1	40.4
16	Jun-14				3113	3.1	43.5
17	Jul-14					-	43.5
18	Aug-14					-	43.5
19	Sep-14					-	43.5
20	Oct-14				2496	2.5	46.0
21	Nov-14					-	46.0
22	Dec-14					-	46.0
23	Jan-15					-	46.0
24	Feb-15					-	46.0
25						-	46.0
26						-	46.0
27						-	46.0
28						-	46.0
29						-	46.0
30						-	46.0
31						-	46.0
32						-	46.0
33						-	46.0
34						-	46.0
35						-	46.0
36						-	46.0
37						-	46.0
38						-	46.0
39						-	46.0
40						-	46.0
41						-	46.0
42						-	46.0
43						-	46.0
44						-	46.0
45						-	46.0
46						-	46.0
47						-	46.0
48						-	46.0
49						-	46.0
50						-	46.0
51						-	46.0
52						-	46.0
53						-	46.0
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61						-	46.0
62						-	46.0
63						-	46.0
64						-	46.0
65						-	46.0
66						-	46.0
67						-	46.0
68						-	46.0
69						-	46.0
70						-	46.0
71						-	46.0
72						-	46.0
73						-	46.0
74						-	46.0
75						-	46.0
76						-	46.0
77						-	46.0
78						-	46.0
79						-	46.0
80						-	46.0
81						-	46.0
82						-	46.0
83						-	46.0
84						-	46.0
85						-	46.0
86						-	46.0
87						-	46.0
88						-	46.0
89						-	46.0
90						-	46.0
91						-	46.0
92						-	46.0
93						-	46.0
94						-	46.0
95						-	46.0
96						-	46.0
97						-	46.0
98						-	46.0
99						-	46.0
100						-	46.0
	M/S RKD Construction Pvt. Ltd	11,500	11,444	11,220	Page 16937	46,000	World Bank Project
	CONTRACTOR						EMPLOYER

(Signature)
 Chief Engineer
 World Bank Project
 EMPLOYER



(Signature)
 Chief Engineer
 World Bank Project
 O/o the E.I.C.(Civil), Odisha
 Bhubaneswar

Name of Project - **BALANCE WORK FOR BERHAMPUR TO TAPTAPANI**
 from Berhampur to Taptapani (Km. 0/0 to 41/0 of SH - 17)
 Name of Contractor - **RKD Construction Pvt. Ltd.**
 Name of Consultant - **Matheson Stephen Valuations**

BERHAMPUR - TAPTAPANI, SH-17

BO/ITEM NO: 2.02.2.03.2.04

ITEM OF WORK: EMBANKMENT & SUBGRADE

MONTH WISE & SECTION WISE QUANTITY

SI	MONTH	SECTION WISE QUANTITY IN CUM				TOTAL QUANTITY	CUMULVE QUANTITY
		I	II	III	IV		
1	Mar-13	1660.237				1.660	1.660
2	Apr-13	13383.254				13.383	15.043
3	May-13	13383.254				13.383	28.427
4	Jun-13	13383.254				13.383	41.810
5	Jul-13	11723.017				11.723	53.533
6	Aug-13					-	53.533
7	Sep-13					-	53.533
8	Oct-13		17811.913			17.812	71.345
9	Nov-13		17811.913			17.812	89.157
10	Dec-13		17811.913			17.812	106.969
11	Jan-14		14982.733	5647.066		20.630	127.599
12	Feb-14			35552.721		35.553	163.151
13	Mar-14			35552.721		35.553	198.704
14	Apr-14			29905.655	4226.829	34.132	232.836
15	May-14			29905.655	4226.829	34.132	266.969
16	Jun-14				34072.673	34.073	301.042
20	Jul-14				0.000	-	301.042
21	Aug-14					-	301.042
22	Sep-14					-	301.042
23	Oct-14				34072.673	34.073	335.114
24	Nov-14				29845.844	29.846	364.960
25	Dec-14				29845.844	29.846	394.806
26	Jan-15					-	394.806
27	Feb-15					-	394.806
Mis RKD Construction Pvt. Ltd CONTRACTOR TOTAL		53533.017	68418.473	136563.829	237890.691	394806.000	World Bank Projects, Odisha EMPLOYER



Name of Project - **BALANCE WORK FOR BERHAMPUR TO TAPTAPANI**
from Berhampur to Taptapani (Km. 0/0 to 41/0 of SH - 17)

Name of Contractor - **RKD Construction Pvt. Ltd.**
Name of Consultant - **Matheson Stephen Valuations**

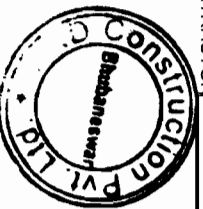
BERHAMPUR - TAPTAPANI, SH-17

BOQ ITEM NO. 3.01

ITEM OF WORK: SUBBASE (GSB)

MONTH WISE & SECTION WISE QUANTITY

SECTION	SECTION WISE QUANTITY IN CUM				TOTAL QUANTITY	CUMULVE QUANTITY
	I	II	III	IV		
SI	MONTH					
1	Mar-13				-	-
2	Apr-13				-	-
3	May-13	3714.938			3,715	3,715
4	Jun-13	3714.938			3,715	7,430
5	Jul-13	3714.938			3,715	11,145
6	Aug-13	3714.938			3,715	14,860
7	Sep-13	3714.938			3,715	18,575
8	Oct-13		2947.842		2,948	21,523
9	Nov-13		2947.842		2,948	24,470
10	Dec-13		2947.842		2,948	27,418
11	Jan-14		2947.842		2,948	30,366
12	Feb-14		2947.842		2,948	33,314
13	Mar-14			6849.075	6,849	40,163
14	Apr-14			6849.075	6,849	47,012
15	May-14			6849.075	6,849	53,861
16	Jun-14			6849.075	6,849	60,710
20	Jul-14			0.000	-	60,710
21	Aug-14			0.000	-	60,710
22	Sep-14			7410.699	7,411	68,121
23	Oct-14			7410.699	7,411	75,532
24	Nov-14			7410.699	7,411	82,942
25	Dec-14			7410.699	7,411	90,353
26	Jan-15			0.000	-	
27	Feb-15			0.000	-	
Mis RKD Construction Pvt Ltd		18574.692	14739.210	27396.301	90353.000	World Bank
CONTRACTOR				Page 8 of 167		EMPLOYER



Chief Engineer
World Bank Project
Projects, Odisha
EMPLOYER

Chief Engineer
World Bank Project
O/o the E.I.C.(Civil), Odisha
Bhubaneswar

Name of Project - BALANCE WORK FOR BERHAMPUR TO TAPTAPAN
 Name of Contractor - RKD Construction Pvt. Ltd.
 Name of Consultant - Matheson Stephen Valuations

BERHAMPUR - TAPTAPANI, SH-17

BOQ ITEM NO: 3.02

ITEM OF WORK: BASE (WMM)

MONTH WISE & SECTION WISE QUANTITY

SECTION	SECTION WISE QUANTITY IN CUM				TOTAL QUANTITY	CUMULATIVE QUANTITY
	I	II	III	IV		
SI	MONTH					
1	Mar-13				-	-
2	Apr-13				-	-
3	May-13	0.000			-	-
4	Jun-13	3518.199			3,518	3,518
5	Jul-13	3518.199			3,518	7,036
6	Aug-13	3518.199			3,518	10,555
7	Sep-13	3518.199			3,518	14,073
8	Oct-13	3518.199			3,518	17,591
9	Nov-13		3489.659		3,490	21,081
10	Dec-13		3489.659		3,490	24,570
11	Jan-14		3489.659		3,490	28,060
12	Feb-14		3489.659		3,490	31,550
13	Mar-14			6486.355	6,486	38,036
14	Apr-14			6486.355	6,486	44,522
15	May-14			6486.355	6,486	51,009
16	Jun-14			6486.355	6,486	57,495
20	Jul-14			0.000	-	57,495
21	Aug-14			0.000	-	57,495
22	Sep-14				7018.237	64,513
23	Oct-14				7018.237	71,532
24	Nov-14				7018.237	78,550
25	Dec-14				7018.237	85,568
26	Jan-15				0.000	-
27	Feb-15				0.000	-
	TOTAL	17290.996	13958.637	25945.421	85568.000	

M/s RKD Construction Pvt. Ltd
 CONTRACTOR

17290.996 13958.637 25945.421 85568.000

85568.000

World Bank Project EMPLOYER

Chief Engineer
 World Bank Project
 Odisha
 EMPLOYER



Chief Engineer
 World Bank Project
 Odisha
 Bhubaneswar

Name of Project - BALANCE WORK FOR BERHAMPUR TO TAPTAPAN
 Name of Contractor - RKD Construction Pvt. Ltd.
 Name of Consultant - Matheson Stephen Valuations

BERHAMPUR - TAPTAPANI, SH-17

BOQ ITEM NO: 4.02

ITEM OF WORK: TACK COAT

MONTH WISE & SECTION WISE QUANTITY

SECTION	SECTION WISE QUANTITY IN CUM				TOTAL QUANTITY	CUMULVE QUANTITY
	I	II	III	IV		
SI	MONTH					
1	Mar-13				-	-
2	Apr-13				-	-
3	May-13	0.000			-	-
4	Jun-13	0.000			-	-
5	Jul-13	0.000			-	-
6	Aug-13	0.000			-	-
7	Sep-13	0.000			-	-
8	Oct-13	0.000			-	-
9	Nov-13	85917.513			85,918	85,918
10	Dec-13	85917.513			85,918	171,835
11	Jan-14		0.000		-	171,835
12	Feb-14		0.000		-	171,835
13	Mar-14		90346.251		90,346	262,181
14	Apr-14		90346.251		90,346	352,528
15	May-14		0.000		-	352,528
16	Jun-14		0.000		-	352,528
20	Jul-14		88574.756		88,575	441,102
21	Aug-14		88574.756		88,575	529,677
22	Sep-14		0.000		-	529,677
23	Oct-14		0.000		-	529,677
24	Nov-14		0.000		-	529,677
25	Dec-14		98317.979		98,318	627,995
26	Jan-15		98317.979		98,318	726,313
27	Feb-15		0.000		-	726,313
	TOTAL	171835.027	190692.502	177149.513	196635.959	726313.000

M/s RKD Construction Pvt. Ltd
 CONTRACTOR

171835.027

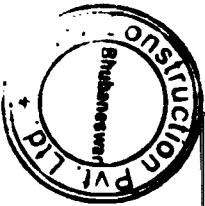
190692.502

177149.513

196635.959

726313.000

World Bank Projects



[Handwritten Signature]
 27 Feb-15

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 Chief Engineer
 Projects, Odisha
 EMPLOYER

Chief Engineer
 World Bank Project
 O/o the E.I.C.(Civil), Odisha
 Bhubaneswar

Name of Project - BALANCE WORK FOR BERHAMPUR TO TAPTAPAN
 Name of Contractor - RKD Construction Pvt. Ltd.
 Name of Consultant - Matheson Stephen Valuations

BERHAMPUR - TAPTAPANI SH-17

BOQ ITEM NO: 4.03

ITEM OF WORK: TACK COAT

MONTH WISE & SECTION WISE QUANTITY

SECTION	SECTION WISE QUANTITY IN CUM				TOTAL QUANTITY	CUMULATIVE QUANTITY
	I	II	III	IV		
SI MONTH						
1 Mar-13					-	-
2 Apr-13					-	-
3 May-13	0.000				-	-
4 Jun-13	0.000				-	-
5 Jul-13	0.000				-	-
6 Aug-13	0.000				-	-
7 Sep-13	0.000				-	-
8 Oct-13	0.000				-	-
9 Nov-13	2282.5				2,283	2,283
10 Dec-13	2282.5				2,283	4,565
11 Jan-14		0.000			-	4,565
12 Feb-14		0.000			-	4,565
13 Mar-14		1811.2			1,811	6,376
14 Apr-14		1811.2			1,811	8,188
15 May-14			0.000		-	8,188
16 Jun-14			0.000		-	8,188
20 Jul-14			3366.6		3,367	11,554
21 Aug-14			3366.6		3,367	14,921
22 Sep-14				0.000	-	14,921
23 Oct-14				0.000	-	14,921
24 Nov-14				0.000	-	14,921
25 Dec-14				3642.6	3,643	18,563
26 Jan-15				3642.6	3,643	22,206
27 Feb-15				0.000	-	22,206
Mis RKD Construction Pvt Ltd CONTRACTOR TOTAL	4565.090	3622.446	6733.17	7430.292	22206.000	



Chief Engineer
 World Bank Projects, Odisha
 EMPLOYER
 World Bank Project
 Odisha
 Bhubaneswar.

Name of Project - BALANCE WORK FOR BERHAMPUR TO TAPTAPAN
 Name of Contractor - RKD Construction Pvt. Ltd
 Name of Consultant - Matheson Stephen Valuations

BERHAMPUR - TAPTAPANI, SH-17

BOQ ITEM NO: 4.03

ITEM OF WORK: TACK COAT

MONTH WISE & SECTION WISE QUANTITY

SI	MONTH	SECTION WISE QUANTITY IN CUM				TOTAL QUANTITY	CUMULVE QUANTITY
		I	II	III	IV		
1	Mar-13					-	-
2	Apr-13					-	-
3	May-13	0.000				-	-
4	Jun-13	0.000				-	-
5	Jul-13	0.000				-	-
6	Aug-13	0.000				-	-
7	Sep-13	0.000				-	-
8	Oct-13	0.000				-	-
9	Nov-13	1914.2				1,914	1,914
10	Dec-13	1914.2				1,914	3,828
11	Jan-14		0.000			-	3,828
12	Feb-14		0.000			-	3,828
13	Mar-14		2012.9			2,013	5,841
14	Apr-14		2012.9			2,013	7,854
15	May-14			0.000		-	7,854
16	Jun-14			0.000		-	7,854
20	Jul-14			1973.4		1,973	9,828
21	Aug-14			1973.4		1,973	11,801
22	Sep-14				0.000	-	11,801
23	Oct-14				0.000	-	11,801
24	Nov-14				0.000	-	11,801
25	Dec-14				2190.5	2,190	13,992
26	Jan-15				2190.5	2,190	16,182
27	Feb-15				0.000	-	16,182
	TOTAL	3828.424	4025.766	3946.829	4380.980	16182.000	

M/s RKD Construction Pvt. Ltd
 CONTRACTOR

World Bank Projects, Odisha
 EMPLOYER



Chief Engineer
 World Bank Project
 O/o the E.I.C.(Civil), Odisha
 Bhubaneswar.

Name of Project - **BALANCE WORK FOR BERHAMPUR TO TAPTAPANI**
 from Berhampur to Taptapani (Km. 0/0 to 41/0 of SH - 17)
 Name of Contractor - **RKD Construction Pvt. Ltd.**
 Name of Consultant - **Matheson Stephen Valuations**

BERHAMPUR - TAPTAPANI. SH-17

BOQ ITEM NO:

ITEM OF WORK: **PCG**

MONTH WISE & SECTION WISE QUANTITY

SI	MONTH	SECTION WISE QUANTITY IN CUM				TOTAL QUANTITY	CUMULVE QUANTITY
		I	II	III	IV		
1	Mar-13	55.379				55	55
2	Apr-13	55.379				55	111
3	May-13	55.379				55	166
4	Jun-13	0.000	168.333			168	334
5	Jul-13		168.333			168	503
6	Aug-13		168.333			168	671
7	Sep-13		106.667			107	778
8	Oct-13		55.379			55	833
9	Nov-13		55.379			55	889
10	Dec-13		55.379			55	944
11	Jan-14			166.138		166	1,110
12	Feb-14			166.138		166	1,276
13	Mar-14			199.805		200	1,476
14	Apr-14			199.805		200	1,676
15	May-14			33.667	304.586	338	2,014
16	Jun-14			21.333	304.586	326	2,340
20	Jul-14					-	2,340
21	Aug-14				101.000	101	2,441
22	Sep-14				101.000	101	2,542
23	Oct-14				101.000	101	2,643
24	Nov-14				64.000	64	2,707
25	Dec-14					-	2,707
26	Jan-15					-	2,707
27	Feb-15					-	2,707
	TOTAL	166.138	777.805	786.885	976.172	2707.000	

M/S RKD Construction Pvt. Ltd
 CONTRACTOR

Chief Engineer
 World Bank Projects, Odisha
 BERHAMPUR

O/o the E.I.C.(Civil), Odisha
 World Bank Project
 Bhubaneswar.



Name of Project - **BALANCE WORK FOR BERHAMPUR TO TAPTAPANI**
 from Berhampur to Taptapani (Km. 0/0 to 4/10 of SH - 17)
 Name of Contractor - **RKD Construction Pvt. Ltd.**
 Name of Consultant - **Matheson Stephen Valuations**

BERHAMPUR - TAPTAPANI, SH-17

BOQ ITEM NO:

ITEM OF WORK: M15 & M20**MONTH WISE & SECTION WISE QUANTITY**

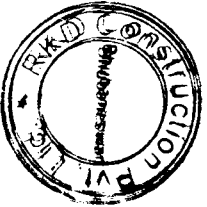
SECTION	SECTION WISE QUANTITY IN CUM				TOTAL QUANTITY	CUMULVE QUANTITY
	I	II	III	IV		
SI						
MONTH						
1	Mar-13	0.000			-	-
2	Apr-13	112.414			112	112
3	May-13	112.414			112	225
4	Jun-13	112.414			112	337
5	Jul-13	0.000			-	337
6	Aug-13	0.000			-	337
7	Sep-13	0.000	181.389		181	519
8	Oct-13	0.000	241.944		242	761
9	Nov-13		172.969		173	934
10	Dec-13		112.414		112	1,046
11	Jan-14		112.414		112	1,158
12	Feb-14			337.241	337	1,496
13	Mar-14			337.241	337	1,833
14	Apr-14			337.241	337	2,170
15	May-14			337.241	337	2,507
16	Jun-14			36.278	655	3,162
20	Jul-14			48.389	48	3,210
21	Aug-14			12.111	12	3,222
22	Sep-14				618	3,841
23	Oct-14				0.000	3,841
24	Nov-14				108.833	3,950
25	Dec-14				145.167	4,095
26	Jan-15				36.333	4,131
27	Feb-15				0.000	4,131
	TOTAL	337.241	821.130	1445.743	1526.885	4131.000

M/s RKD Construction Pvt. Ltd
 CONTRACTOR

Page 173

World Bank
 Chief Engineer
 Projects, Odisha
 EMPLOYER

Chief Engineer,
 World Bank Project
 O/o the E.I.C.(Civil), Odisha
 Bhubaneswar.



Name of Project - **BALANCE WORK FOR BERHAMPUR TO TAPTAPANI**
 from Berhampur to Taptapani (Km. 0/0 to 41/0 of SH - 17)
 Name of Contractor - **RKD Construction Pvt. Ltd.**
 Name of Consultant - **Matheson Stephen Valuations**

BERHAMPUR - TAPTAPANI, SH-17

BOQ ITEM NO.:

ITEM OF WORK: RCC

MONTH WISE & SECTION WISE QUANTITY

SI	MONTH	SECTION WISE QUANTITY IN CUM				TOTAL QUANTITY	CUMULVE QUANTITY
		I	II	III	IV		
1	Mar-13					-	-
2	Apr-13	91.517				92	92
3	May-13	91.517				92	183
4	Jun-13	91.517				92	275
5	Jul-13		343.704			344	618
6	Aug-13		699.445			699	1,318
7	Sep-13	72.517	699.445			772	2,090
8	Oct-13		355.741			356	2,445
9	Nov-13					-	2,445
10	Dec-13		137.276			137	2,583
11	Jan-14		137.276			137	2,720
12	Feb-14					-	2,720
13	Mar-14		72.517			73	2,792
14	Apr-14			617.844		618	3,410
15	May-14			688.992		689	4,099
16	Jun-14			139.889		643	4,743
20	Jul-14					-	4,743
21	Aug-14			290.069		290	5,033
22	Sep-14					709.567	5,742
23	Oct-14					419.667	6,162
24	Nov-14					419.667	6,582
25	Dec-14					213.445	6,795
26	Jan-15					265.897	7,061
27	FEB-15					-	-
	TOTAL	347,069	2445,403	1736,793	2531,586	7060,852	

M/s RKD Construction Pvt. Ltd
 CONTRACTOR

Page 174

World Bank

Chief Engineer
 EMPLOYER
 Projects, Odisha
 Chief Engineer,
 World Bank Project
 O/o the E.I.C.(Civil), Odisha
 Bhubaneswar.



Name of Project - **BALANCE WORK FOR BERRAMPUR TO TAPTAPANI** from Berrampur to Taptapani (Km. 0/0 to 41/0 of SH - 17)
 Name of Contractor - **RKD Construction Pvt. Ltd.**
 Name of Consultant - **Matheson Stephen Valuations**

MONTH WISE - ITEM WISE QUANTITIES

SL	MONTH	EXCAVATION	C&G	EMBANKMENT & SUBGRADE	SUB BASE (GSB)	BASE (WMM)	PRIME COAT	TACK COAT	DSM	BC	PCC	M15-20	RCC
1	Nov-18	9126	3	1660							55		
2	Dec-18	9126	3	1383							55	112	92
3	Jan-19	9126	3	1383							55	112	92
4	Feb-19	9126	3	1383							168	112	92
5	Mar-19			11723							168		344
6	Apr-19										168		699
7	May-19										107	181	772
8	Jun-19			17812							55	242	356
9	Jul-19			17812							55	173	
10	Aug-19			17812							55	112	137
11	Sep-19			20630							166	112	137
12	Oct-19			35553							166	337	
13	Nov-19			31040							2013	200	337
14	Dec-19			23234							1811	2013	337
15	Jan-20			34132							2013	200	337
16	Feb-20			34073							336	337	689
17	Mar-20			34073							326	655	843
18	Apr-20										3367	1973	48
19	May-20										40185	88575	1973
20	Jun-20			34073							101	618	710
21	Jul-20			29846							101	101	420
22	Aug-20			29846							64	109	420
23	Sep-20										7018	145	213
24	Oct-20										44606	98318	36
ITEM WISE TOTAL		289212	46	384806	90353	85568	329519	726313	22206	16182	2707	4131	7061

MONTH WISE - ITEM WISE ACCUMULATED QUANTITIES

SL	MONTH	EXCAVATION	C&G	EMBANKMENT & SUBGRADE	SUB BASE (GSB)	BASE (WMM)	PRIME COAT	TACK COAT	DSM	BC	PCC	M15-20	RCC
1	Nov-18	9126	3	1660							55		
2	Dec-18	18252	6	15043							111	112	92
3	Jan-19	27377	8	28427							166	225	183
4	Feb-19	36503	12	41810							334	337	275
5	Mar-19	36503	12	53533							503	337	618
6	Apr-19	36503	12	53533							671	337	1318
7	May-19	36503	12	53533							778	519	2096
8	Jun-19	52054	15	71345							833	761	2445
9	Jul-19	67606	19	69157							889	934	2445
10	Aug-19	83157	23	106969							944	1046	2863
11	Sep-19	114197	27	127999							1110	1158	2720
12	Oct-19	145237	30	163151							1276	1496	2720
13	Nov-19	178278	34	198704							1478	1833	2792
14	Dec-19	199511	37	232836							1676	2170	3410
15	Jan-20	222745	40	266868							2014	2507	4099
16	Feb-20	245978	44	301042							2340	3162	4743
17	Mar-20	245978	44	301042							2340	3210	4743
18	Apr-20	245978	44	301042							11801	2441	3222
19	May-20	245978	44	301042							11801	2542	5742
20	Jun-20	269212	46	335114							11801	2843	6162
21	Jul-20	269212	46	335114							11801	3560	6582
22	Aug-20	269212	46	335114							11801	4096	6795
23	Sep-20	269212	46	335114							11801	4713	7061
24	Oct-20	269212	46	335114							11801	5430	7374
ITEM WISE TOTAL		289212	46	384806	90353	85568	329519	726313	22206	16182	2707	4131	7061



M/s RKD Construction Pvt. Ltd
 CONTRACTOR

329519
 726313

Chief Engineer
 World Bank Projects, Odisha
 EMPLOYER

Chief Engineer
 World Bank Project
 O/o The E.I.C.(Civil), Odisha
 Bhubaneswar

Name of Name of Project : BALANCE WORK FOR BERHAMPUR TO TAPTAPANI from Berhampur to Taptapani (Km. 00 to 41/0 of SH - 17)

Name of Name of Contractor : RKD Construction Pvt. Ltd.

Name of Name of Consultant : Matheson Stephen Valuations



M/s RKD Construction Pvt. Ltd
CONTRACTOR

[Handwritten Signature]

MONTHWISE TARGET QUANTITY

Sl.	Item of work	Uo	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15	Remarks	
1	Excavation	Cum	9126	9126	9126	9126				15551	15551	15551	31040	31040	31040	23234	23234	23234				23234						289212
2	C & G	Sam	3	3	3	3				4	4	4	4	4	4	3	3	3										46
3	Embankment	Cum	1880	13383	13383	13383	11723			17812	17812	17812	20630	35553	35553	34132	34132	34073				34073	29846	29846			394808	
4	GSD	Cum			3715	3715	3715	3715	3715	2948	2948	2948	2948	2948	6849	6849	6849	6849										90353
5	WMM	Cum					3518	3518	3518	3518	3518	3518	3490	3490	3490	3490	6486	6486			7411	7411	7411	7411			85568	
6	Prime coat	Sam								38980	38980				40869	40869			40185	40185				44606	44606		329519	
7	Tack Coat	Sam								85918	85918				80346	80346			88575	88575				96316	96316		726313	
8	DDM	Cum								2283	2283				1611	1611			3367	3367				3643	3643		22206	
9	BC	Cum								1914	1914				2013	2013			1973	1973				2190	2190		18182	
9	FORM_PCC	Cum	55	55	55	168	168	168	107	55	55	55	166	166	200	200	338	326		101	101	101	84				2707	
9	MIS & MDE	Cum		112	112	112			181	242	173	112	112	337	337	337	655	655	48	12	618		109	145	36		4151	
9	PCC	Cum		92	92	92	344	699	772	356		137	137		73	616	689	643		290	710	420	420	213	296		7081	

MONTHWISE WISE PLANT & MACHINERY REQUIREMENT

Sl.	Type of Machinery	Uo	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15	Remarks	
1	Dozer	Nos	1	1	1	1				1	1	1	1	1	1	1	1	1				1						
2	Calibrator	Nos	1	1	1	1				1	1	1	2	2	2	1	1	1				1						
3	Loader/LCB	Nos			1	1	1	1	1	1	1	1	1	1	2	2	2	2			2	2	2	2				
4	Grader	Nos	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2			1	2	2	2				
5	Soil Compactors	Nos	1	1	1	2	2	1	1	2	2	2	2	3	3	3	3	3			1	3	3	3				
6	Tandem Roller	Nos	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
8	Samson Pave	Nos								1	1				1	1			2	2				1	1			
9	Stump Puller	Nos								2	2				2	2			2	2				2	2			
10	Dump Trucks	Nos	6	12	14	15	9	4	4	20	20	20	30	37	41	36	36	36			8	36	21	21				
11	Crushing Plant	Nos			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
12	Hot Mix Plant	Nos				1	1	1	1	1	1	1	1	1	2	2	2	2			2	2	2	2				
13	Hot Mix Plant	Nos								1	1				1	1								1	1			
14	Gen B Plant	Nos	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
15	DG Set	Nos	4	4	4	4	4	4	4	4	4		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
17	Water Pumps	Nos	4	4	4	4	4	4	4	4		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
18	Vibrator	Nos	8	8	8	8	8	8	8	8		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	
19	Water Tank	Nos	1	1	1	2	2	1	1	2	2	2	2	3	3	3	3	3			1	3	3	3				
20	Trench Moe	Nos	1	1	1	1	2	2	3	2	1	1	1	2	2	3	4	4			1	1	4	2	2	1	1	
21	PTR	Nos									1	1			1	1					1	1			1	1		

MONTHWISE WISE QUANTITY OF MATERIAL REQUIREMENTS

Sl.	Item	Uo	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15	Remarks
1	Earth & Morum	Cum	1660	13383	13383	13383	11723			17812	17812	17812	20630	35553	35553	34132	34132	34073				34073	29846	29846			517468
2	Sand	Cum								61046	61046				63910	63910			63421	63421				70352	70352		
3	Humo Pipe	Nos	60	60	70		60	60	70	40	40						60	60	70								650
4	Aggregates	MT	31	147	3166	5869	5948	6151	6260	5405	9339	9383	5249	5299	14600	14911	11206	11353	5368	5569	12098	11581	11622	17322	6005		153681
5	Stuamens	MT								224	224				178	178			330	330				258	258		2178
	CRMB	MT								225	225				237	237			232	232				33	33		1906
	Emulsion (SS)	MT								29	29				31	31			30	30				33	33		247
	Emulsion (RS)	MT								17	17				18	18			18	18				20	20		146
6	HSD	KL	59	71	76	81	65	52	53	92	65	65	115	136	149	137	133	133	42	42	64	131	96	100	41	35	2036
7	Cement	MT	17	98	98	132	188	330	413	256	86	116	150	185	224	442	512	617	19	151	561	198	231	143	121		5289
8	Steel	MT		7	7	7	27	56	62	28		11	11		6	49	55	51		23	57	34	34	17	21		686
10	LDO	KL									16	16			14	14			20	20				22	22		144

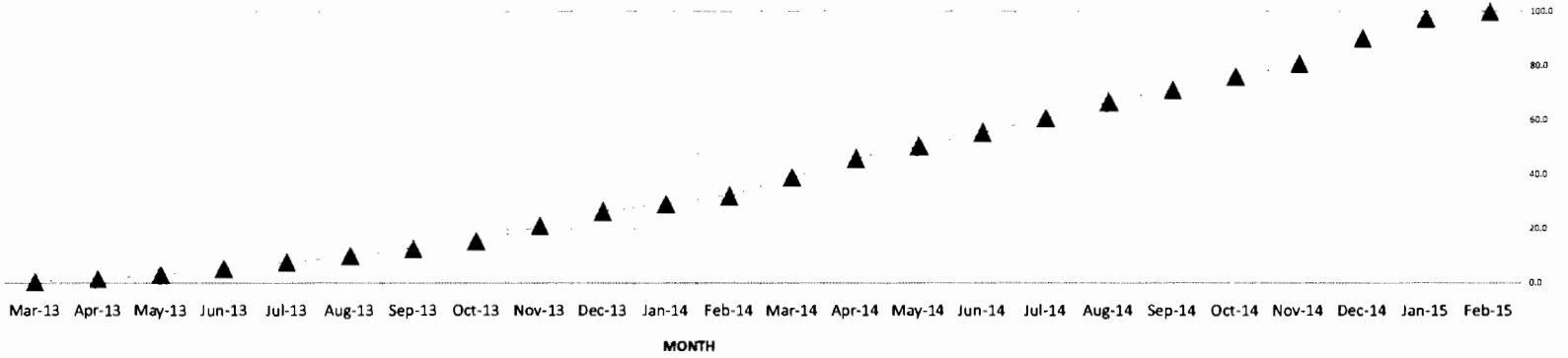
Chief Engineer
World Bank Projects, Odisha
EMPLOYER
Chief Engineer
World Bank Project
The E.I.C.(Civil), Odisha
P.O. No. 97, S.M.A.

'S' Curve

Cumulative at the end of the month % (Planned)

M/s RKD Construction Pvt. Ltd
CONTRACTOR

Cumulative Work %



Month	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15
Planned Amount in Lakhs	6522089	10067857	15172394	20657565	21486491	23703811	24864410	26415372	55323095	54347839	25562489	28323547	66988821	68324546	41928742	47950562	52133102	56757072	43422276	48821265	45516980	88958096	71787501	23715333
Cumulative Amount in Lakhs. (Planned)	6522089	16589947	31762341	52419905	73906397	97610208	122474618	148889990	204213086	258560925	284123414	312446961	379435782	447760328	489689071	537639633	589772735	646529807	689952083	738773348	784290328	873248424	945035925	968751258
% of progress (Planned)	0.7	1.0	1.6	2.1	2.2	2.4	2.6	2.7	5.7	5.6	2.6	2.9	6.9	7.1	4.3	4.9	5.4	5.9	4.5	5.0	4.7	9.2	7.4	2.4
Cumulative at the end of the month % (Planned)	0.7	1.7	3.3	5.4	7.6	10.1	12.6	15.4	21.1	26.7	29.3	32.3	39.2	46.2	50.5	55.5	60.9	66.7	71.2	76.3	81.0	90.1	97.6	100.0

Chief Engineer
World Bank Project
EMPLOYER

Chief Engineer
World Bank Project
O/o the E.I.C.(Civil), Odisha,
Bhubaneswar



Issue of Notice to proceed with the work

(letterhead of the Employer)

_____ (date)

To


_____ (name and address of the Contractor)

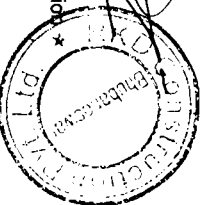
Dear Sirs:


Pursuant to your furnishing the requisite security as stipulated in ITB clause 34.1 and signing of the contract agreement for the construction of _____ @ a Bid Price of Rs. _____, you are hereby instructed to proceed with the execution of the said works in accordance with the contract documents.

Yours faithfully,

(Signature, name and title of
signatory authorized to sign on behalf
of Employer)


M/s RKD Construction
CONTRACTOR




Chief Engineer
World Bank Projects
EMPLOYER

BANK GUARANTEE FOR ADVANCE PAYMENT

To: _____ [*name of Employer*]

_____ [*address of Employer*]

_____ [*name of Contract*]

Gentlemen:

In accordance with the provisions of the Conditions of Contract, subclause 51.1 ("Advance Payment") of the above-mentioned Contract, _____ [*name and address of Contractor*] (hereinafter called "the Contractor") shall deposit with _____ [*name of Employer*] a bank guarantee to guarantee his proper and faithful performance under the said Clause of the Contract in an amount of _____ [*amount of guarantee*] of _____ [*in words*].

We, the _____ [*bank or financial institution*], as instructed by the Contractor, agree unconditionally and irrevocably to guarantee as primary obligator and not as Surety merely, the payment to _____ [*name of Employer*] on his first demand without whatsoever right of objection on our part and without his first claim to the Contractor, in the amount not exceeding _____ [*amount of guarantee*] _____ [*in words*].

We further agree that no change or addition to or other modification of the terms of the Contract or of Works to be performed thereunder or of any of the Contract documents which may be made between _____ [*name of Employer*] and the Contractor, shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

This guarantee shall remain valid and in full effect from the date of the advance payment under the Contract until _____ [*name of Employer*] receives full repayment of the same amount from the Contractor.

Yours truly,


Signature and seal: _____

Name of Bank/Financial Institution: _____

Address: _____

Date: _____

1 An amount shall be inserted by the bank representing the amount of the Advance Payment, and denominated in Indian Rupees.


M/s RKD Constripts
CONTRACTOR