



GOVERNMENT OF ODISHA  
WORKS DEPARTMENT

CIVIL WORKS CONTRACT

**PACKAGE No. OSRP-Bal-P02**

*For*

Construction for Widening & Strengthening of Existing Carriageway  
to 2-Lane for Chandbali-Bhadrak-Anandpur Road  
(Km.0/000to Km.45/000 of SH-9 & Km.0/0 to Km.43/0 of SH-53)  
(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 CORSAN CORVIAM CONSTRUCCION S.A,**

India Office: 2nd Floor, Blok Two, Vatika Business Park,  
Sector-49, Sohna Road, Gurgaon-122001, Haryana (India)  
Tel. No.:(+91) 124 4823 200, Fax: (+91) 124 4823 210

**[VOLUME-I: Agreement]**

**Agreement Value: Rs. 248,12,19,385**

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

September 27, 2013

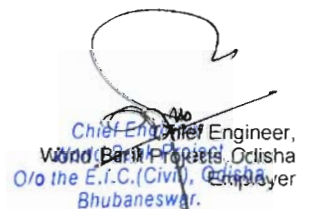


CONTENTS of CONTRACT

Volume – I	:	Letter of Acceptance, Letter of Bid and Addenda
Volume – II	:	Particular Conditions and the General Conditions;
Volume – III	:	Specifications
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CIVIL WORKS CONTRACT

For

Construction for Widening & Strengthening of existing carriageway to 2-lane for Chandbali-Bhadrak-Anadpur Road (Km. 0/000 to Km. 45/000 of SH – 9 & Km 0/000 to Km. 43/000 of SH – 53) (Balance Work)

THIS AGREEMENT made the 27<sup>th</sup> day of September, 2013, between the Chief Engineer, World Bank Projects, Odisha, office of the Engineer-in-Chief(Civil), Odisha, Nirman South, Unit-V, Kesari Nagar, Bhubaneswar-751001, Odisha (India) on behalf of the Government of Odisha in Works Department, Odisha Secretariat, Bhubaneswar-751001 (hereinafter “the Employer”), of the one part, and M/s Corsan Corviam Construccion S.A, India Office: 2nd Floor, Blok Two, Vatica Business Park, Sector-49, Sohna Road, Gurgaon-122001, Haryana (India), Tel No.: (+91) 124 4823 200. Fax No.: ((+91) 124 4823 210, Email: dmishra@isoluxcorsan.com, (hereinafter “the Contractor”), of the other part for an amount of Rs. 248,12,19,385.00 ( Indian Rupees Two Hundred Forty Eight Crore Twelve Lakhs Nineteen Thousand Three Hundred Eighty Five) only:

  
Corsan Corviam Construccion S.A.  
Contractor

  
Chief Engineer,  
World Bank Projects, Odisha  
Office of the E.I.C.(Civil), Employer  
Bhubaneswar.

9/1/2018

2018/1/9

ଅଧିକାରୀଙ୍କୁ ଉପସ୍ଥାପନ  
କରିବା ପାଇଁ

DISTRICT TREASURY  
BHUBANESWAR

M. Harichandran

ଅଧିକାରୀଙ୍କୁ ଉପସ୍ଥାପନ  
କରିବା ପାଇଁ



Corsan Corviam Construcción S.A.  
Contractor



Chief Engineer,  
World Bank Projects, Odisha  
Employer

WHEREAS the Employer desires that the Works known as “Construction for Widening and Strengthening of existing carriageway to 2-lane for Chandbali-Bhadrak-Anandpur Road (Km.0/000to Km.45/000 of SH-9 & Km.0/000 to Km.43/000 of SH-53)(Balance Work)” should be executed by the Contractor, and has accepted a Bid by the Contractor for the execution and completion of these Works and the remedying of any defects therein,

The Employer and the Contractor agree as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Contract documents referred to.
2. The following documents shall be deemed to form and be read and construed as part of this Agreement. This Agreement shall prevail over all other Contract documents.

Volume - I	Volume - III
(i) the Letter of Acceptance	(vi) the Specification
(ii) of the Letter Bid	Volume - IV
(iii) the addenda 85 Pages	(vii) the Drawings; and
Volume - II	Volume - V
(iv) the Particular Conditions	(viii) the completed Schedules,
(v) the General Conditions;	

3. In consideration of the payments to be made by the Employer to the Contractor as indicated in this Agreement, the Contractor hereby covenants with the Employer to execute the Works and to remedy defects therein in conformity in all respects with the provisions of the Contract.


4. The Employer hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying of defects therein, 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.

  
Corviam Construction S.A.  
Contractor

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

IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with the laws of INDIA on the day, month and year indicated above.

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

  
Er. Om Prakash Patel  
Chief Engineer, World Bank Projects, Odisha

*For and on behalf of the authorized representative  
of the Bidder M/s Corsan Corviam Construcccion S.A.*

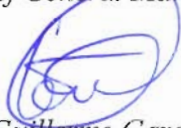


Mr. Jose Garrido De las Heras  
Managing Director

Witness :



1. Mr. Ramesh Kumar Gupta,  
Chief General Manager, Corsan Corviam Construcccion S.A



2. Mr Guillermo Garcia Moliz  
Management Control Department, Corsan Corviam Construcccion S.A




3. Er. Anil Kanta Tripathy,  
Superintending Engineer-cum-Employer's Representative-P02,  
O/o the EIC (Civil), Odisha

4. Mr. K.B.Panda  
Financial Advisor, Project Management Unit,  
Odisha State Roads Project





Corsan Corviam Construcccion S.A.  
Contractor

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



# NO OBJECTION OF THE WORLD BANK

Page 1 of 1

## Chief Engineer, World Bank Projects, Odisha

**From:** <rohatsg@worldbank.org>  
**To:** "N K Pradhan" <pmuosrp@gmail.com>  
**Cc:** "Kumudini Choudhary" <kchoudhary@worldbank.org>, "Swayamsiddha Mohanty" <smohanty1@worldbank.org>, "Sri Kumar Tadimala" <stadimala@worldbank.org>  
**Sent:** Wednesday, July 17, 2013 7:38 PM  
**Subject:** NO OBJECTION : Odisha State Roads Project- Package No. OSRP-Bal-P02- Submission of BID Evaluation Report

Dear Mr Pradhan

Thank you for your e-mail dated June 28, 2013 requesting Bank's review of the Bid Evaluation Report for "Civil Works for Construction for Widening & Strengthening of existing camageway to 2-lane for Chandbali-Bhadra-Anadpur Road (Km 0/000 to Km 45/000 of SH - 9 & Km 0/000 to Km 43/000 of SH - 53) (Balance Work) - Package No. OSRP-Bal-P02" of OSRP.

We have reviewed the subject BER and based on the information provided by you, we have no objection to your recommendation for award of contract for "Civil Works for Construction for Widening & Strengthening of existing camageway to 2-lane for Chandbali-Bhadra-Anadpur Road (Km 0/000 to Km 45/000 of SH - 9 & Km 0/000 to Km 43/000 of SH - 53) (Balance Work) - Package No. OSRP-Bal-P02" on M/s. Corsan Corviam Construcción S.A. Spain at a total contract amount of INR 2,481,219,385.00, subject to the following:

- (i) Ensure that schedule of handing over encumbrance free land to the contractor as per provisions of Bidding Document
- (ii) Ensure publication of award results on the Project website and UNDB online within 15 days from Bank's no objection

We look forward to a copy of signed Contract Agreement along with copy of performance security and prior review checklist to enable issuance of WBR No. for claiming disbursement against this contract.

Regards,  
Rajesh Rohatg

*S. B. R. Mohan*  
*02/07/13*

7 18 2013



Corsan Corviam Construcción S.A.  
Contractor

Volume-I: Page 6 of 97

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

## APPROVAL OF THE GOVERNMENT OF ODISHA

GOVERNMENT OF ODISHA  
WORKS DEPARTMENT  
\*\*\*

No. 8784 /W. Bhubaneswar, Dated, the  
0718040081-2013

8th August, 2013

From

Sri A. Mahalik, OFS(SAG)  
FA-cum-Additional Secretary to Government

To

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

**Sub:- Construction for widening and strengthening of existing carriageway to 2-lane for Chandbali – Bhadrak – Anandapur Road (Km.0/000 to 45/000 of SH-9 & Km. 0/000 to Km. 43/000 of SH-53).**

Sir,

I am directed to invite a reference to your letter No 30411 dt.17.7.2013 on the subject noted above and to convey approval of the Government to the lowest substantially responsive evaluated bid of M/s. Corsan Corviam Construccioin. S.A., Spain amounting to Rs.248,12,19,385.00 (Rupees two hundred forty-eight crore, twelve lakh, nineteen thousand, three hundred eighty-five) only which is 1.83% less than the corresponding estimated cost of Rs.252,75,25,779.00 subject to the condition that the bidder be empaneled under the State and the leave of the Court of Learned District Judge, Khurda be obtained before signing of contract in compliance to the Order No.20 dated 05.05.2013 passed in ARBP No.168/2012.

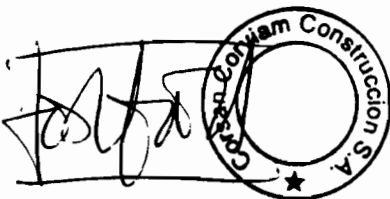
A copy of the proceeding of the tender committee held on 30.7.2013 for the above work is enclosed for reference.

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


Yours faithfully,

Encl: as above

  
21/8/2013  
FA-cum-Additional Secretary to Govt.



Corsan Corviam Construccioin S.A.  
Contractor

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

## NOTIFICATION OF AWARD

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

Letter No. PMU-WB-17/2013 - 34471

August 8, 2013

**From**

**Er. Bharat Chandra Pradhan**  
Chief Engineer, World Bank Projects, Odisha  
Tel.: + 91 - 674 - 239 6783 / Fax: + 91 674 - 239 0080  
Email: [pmuosrp@gmail.com](mailto:pmuosrp@gmail.com)

**To**

**M/s Corsan Corviam Construccion S.A, Spain**  
India Office:  
2nd Floor, Block Two, Vatika Business Park,  
Sector-49, Sohna Road, Gurgaon, Haryana.  
Email: [dmishra@isoluxcorsan.com](mailto:dmishra@isoluxcorsan.com)

**Sub:** Civil Works ICB Package No-OSRP-Bal-P02 under the proposed Odisha State Roads Project with World Bank Assistance

- Construction for Widening & Strengthening of existing carriageway to 2-lane for Chandbali-Bhadrak-Anadpur Road (Km. 0/000 to Km. 45/000 of SH - 9 & Km 0/000 to Km. 43/000 of SH - 53) (Balance Work)

- LETTER OF ACCEPTANCE

- Ref:**
- i. IFB No: OSRP-Bal-P02 - 7923 Dt. 27.02.2013
  - ii. Your BID Dt. 20.05.2013

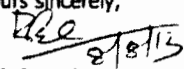
Sir,

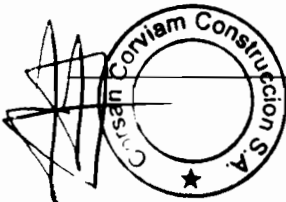
This is to notify you that, your Bid dated 20<sup>th</sup> May, 2013 for execution of the Civil Works ICB Package No-OSRP-Bal-P02 under the proposed Odisha State Roads Project with World Bank Assistance for "Construction for Widening & Strengthening of existing carriageway to 2-lane for Chandbali-Bhadrak-Anadpur Road (Km. 0/000 to Km. 45/000 of SH - 9 & Km 0/000 to Km. 43/000 of SH - 53) (Balance Work)" amounting to Indian Rs. 248,12,19,385 ( Indian Rupees Two hundred Forty-eight crore Twelve lakh Nineteen thousand Three hundred Eighty-five) only, as corrected and modified in accordance with the Instructions to Bidders, has been accepted by the Government of Odisha.

You are requested to furnish the Performance Security in shape of a Bank Guarantee in favour of the Chief Engineer, World Bank Projects, Odisha, Bhubaneswar on any Nationalized Bank located in India, valid till 4<sup>th</sup> December, 2016, amounting not less than Indian Rs.12,40,60,969/- ( Indian Rupees Twelve crore Forty lakh, Sixty thousand Nine hundred Sixty-nine ) only within 28 days of issuance of this letter, in accordance with the Conditions of Contract, using for that purpose one of the Performance Security Forms included in Section IX, Annex to the Particular Conditions - Contract Forms, of the Bidding Document.


Upon submission of a satisfactory Performance Security as stated above, the formal Contract agreement shall be signed.

Yours sincerely,

  
**Chief Engineer**  
World Bank Projects, Odisha



Corsan Corviam Construccion S.A.  
Contractor

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

## LETTER of BID & ADDENDA

### Bid Submission Sheet

(Agreed & Modified as per the evaluated bid)

Date: .17.05.2013

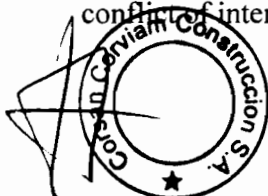
No.: OSRP-BAL-P02

Invitation for Bid No.: OSRP-BAL-P02

To:  
Chief Engineer,  
World Bank Projects, Odisha  
Nirman Soudh, Ground Floor  
Bhubaneswar, 751001  
India

We, the undersigned, declare that:

- (a) We have examined and have no reservations to the Bidding Document, including Addenda issued in accordance with Instructions to Bidders (ITB) 8 3 Nos ;
- (b) We offer to execute in conformity with the Bidding Document the following Works:  
“Construction for Widening & strengthening of existing carrigeway to 2-lane for Chandbali-Bhadrak-Anandpur Road (km.0/000 to Km. 45/000 of SH- 9 and Km.0/000 to Km.43/000 of SH-53) (Balance Work)”
- (c) The total price of our Bid, excluding any discounts offered in item (d) below is:  
  
Rupees 248,12,19,385 (Rupees Two Hundred Forty Eight Crore Twelve Lakh Nineteen Thousand Three Hundred Eighty Five Only)
- (d) The discounts offered and the methodology for their application are: NIL
- (e) Our bid shall be valid for a period of 120 days from the date fixed for the bid submission deadline in accordance with the Bidding Document, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
- (f) If our bid is accepted, we commit to obtain a performance security in accordance with the Bidding Document;
- (g) We, including any subcontractors or suppliers for any part of the contract, have or will have nationalities from eligible countries, in accordance with ITB 4.2;
- (h) We, including any subcontractors or suppliers for any part of the contract, do not have any conflict of interest in accordance with ITB 4.3;



Corsan Corviam Construction S.A.  
Contractor

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

- (i) We are not participating, as a Bidder or as a subcontractor, in more than one bid in this bidding process in accordance with ITB 4.3, other than alternative offers submitted in accordance with ITB 13;
- (j) We, including any of our subcontractors or suppliers for any part of the contract, have not been declared ineligible by the Bank, under the Employer's country laws or official regulations or by an act of compliance with a decision of the United Nations Security Council;
- (k) We are not a government owned entity, but meet the requirements of ITB-4.5;
- (l) We have paid, or will pay the following commissions, gratuities, or fees with respect to the bidding process or execution of the Contract:

Name of Recipient	Address	Reason	Amount
-----NONE-----			

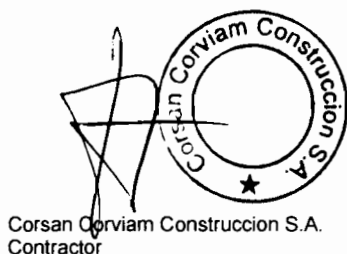
- (m) We understand that this bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal contract is prepared and executed; and
- (n) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive.
- (o) We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf will engage in bribery.

Name **Jose Garrido De las Heras** In the capacity of Authorized Signatory

Signed Sd/- (Jose Garrido De las Heras) & seal affixed

Duly authorized to sign the bid for and on behalf of Corsan Corviam Construccion S.A.

Dated on 17<sup>nd</sup> May day of Friday, 2013



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

# Appendix to Bid

## Schedule of Adjustment Data

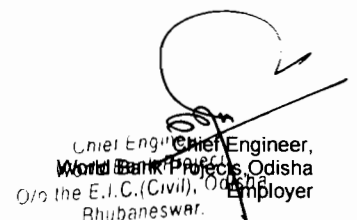
[In Tables A, B, and C, below, the Bidder shall (a) indicate its amount of local currency payment, (b) indicate its proposed source and base values of indices for the different foreign currency elements of cost, (c) derive its proposed weightings for local and foreign currency payment, and (d) list the exchange rates used in the currency conversion. In the case of very large and/or complex works contracts, it may be necessary to specify several families of price adjustment formulae corresponding to the different works involved.]

Table A. Local Currency

Index code*	Index description	Source of index*	Base value and date*	Bidder's related currency amount	Bidder's proposed weighting
a	Nonadjustable				a: 0.15
b	Steel	Whole sale price index for Steel(rebars) Office of Economic advisor to Govt. of India, Ministry of Commerce & Industry			b: 0.10
c	Cement	Whole sale price index of Cement published by office of Office of the Economic advisor to Govt of India, Ministry of Commerce & Industry			c: 0.13
d	Bitumen 60/70 (Bulk)	Official retail price of bulk bitumen at IOC depot at Haldia			d: 0.15
e	Labour	Minimum wage notified by the Labour and Employee's State Insurance Department of Govt. of Odisha, India			e: 0.10
f	POL	Official retail price of HSD at IOCL/HPCL/BPCL Consumer pump depot at Kendrapara, Odisha			f: 0.10
g	Other Materials	All India Wholesale price index(all comodities) as published by the Economic Advisor to the Govt. of India, Ministry of Commerce and Industry			g: 0.20
h	Plant & Equipment	- Do -			h: 0.07
Total					1.00



Corsan Corviam Construcción S.A.  
Contractor



Chief Engineer,  
World Bank Projects, Odisha  
On the E.J.C.(Civil), Odisha  
Bhubaneswar.  
Employer

## Reference for Base Index of Steel

**Name of Commodity : Rebars**

**Type :** Individual Commodity

**Weight :** 0.73617

Month /Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2013	171.4	171	171.3	171.4	171.2	170.9	170.5					
2012	167.9	168.7	171.2	177	175.5	175.9	175.3	174.6	174.6	173.8	172.3	172.1
2011	144.1	150.1	152.1	154.7	155.8	156.1	156.4	157.3	157.9	159	161.8	164.5
2010	133.5	130.4	132.2	143.1	139.7	138.4	136	136.5	136.7	137.5	137.4	137.7

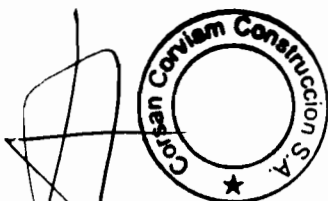
1. Figure 9999.9 may be treated as index for particular item not-available
2. Figures for the latest two months are provisional. Latest two months are to be reckoned with reference to the latest monthly press release issued.

**Senior Economic Adviser,**

Room No. 126-E, Ministry of Commerce and Industry,  
Udyog Bhawan, Rafi Marg, New Delhi - 110 011, INDIA  
Telephone : 91-11-2306 2721 Fax : 91-11-2306 3502  
E-mail to the Senior Economic Adviser

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Corsan Corviam Construccion S.A.  
Contractor

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

## Reference for Base Index of Cement

**Name of Commodity : Grey Cement**

**Type :** Individual Commodity

**Weight :** 1.26347

Month /Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>2013</b>	168.8	170.3	172.9	171.3	170.4	170. 2	169.7					
<b>2012</b>	160.1	160.4	163.1	164.6	164.4	167. 3	169.5	171.9	171.5	170.7	168.3	164.9
<b>2011</b>	147.9	150.9	153.7	154.4	155.3	153. 6	153	151.7	152.2	157.9	160.8	161.7
<b>2010</b>	147.6	150.6	151.3	151.8	152.5	150. 3	153.8	151.6	150.3	151.5	148.3	147.8

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,  
 Udyog Bhawan, Rafi Marg, New Delhi - 110 011, INDIA  
 Telephone : 91-11-2306 2721 Fax : 91-11-2306 3502  
 E-mail to the Senior Economic Adviser

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Corsan Corviam Construcción S.A.  
 Contractor

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



## Reference for Base Index of Bitumen

### Indian Oil Corporation Limited

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



To,

REF: OSO/CS: PR CING  
 DATE: 01.05.2013

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
01.06.12	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	38270.00	37940.00	38740.00	41270.00	28590.00	35500.00	35650.00	35600.00
01.07.12	34940.00	35740.00	38270.00	38040.00	38840.00	41370.00	29040.00	35600.00	35750.00	35700.00
16.07.12	34670.00	35470.00	37960.00	37670.00	38470.00	40960.00	28600.00	35250.00	35410.00	35360.00
01.09.12	36568.00	37368.00	39988.00	39668.00	40468.00	43088.00	30598.00	37178.00	37318.00	37258.00
16.09.12	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	28608.00	29408.00	30828.00	31708.00	32508.00	33928.00	24968.00	29858.00	30158.00	30258.00
16.11.12	30668.00	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	37608.00	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
01.01.13	36438.00	37238.00	39738.00	39538.00	40338.00	42838.00	30398.00	37058.00	37208.00	37148.00
16.01.13	36728.00	37528.00	40078.00	39828.00	40628.00	43178.00	30598.00	37328.00	37468.00	37398.00
16.02.13	36728.00	37528.00	40078.00	39828.00	40628.00	43178.00	30638.00	37328.00	37468.00	37398.00
01.04.13	36870.00	37670.00	40220.00	39970.00	40770.00	43320.00	30870.00	37470.00	37610.00	37540.00
16.04.13	37370.00	38170.00	40720.00	40470.00	41270.00	43820.00	31070.00	37930.00	38060.00	37980.00
01.05.13	37870.00	38670.00	41250.00	40970.00	41770.00	44350.00	31290.00	38390.00	38510.00	38420.00
INCREASE	500.00	500.00	530.00	500.00	500.00	530.00	220.00	460.00	450.00	440.00

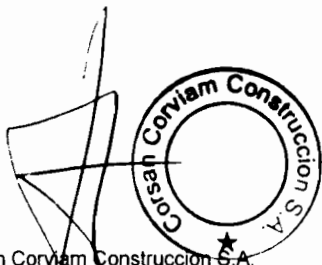
Excise Duty @ 18% will be charged on the Basic Price.

- Education Cess @3% w.e.f.:01.03.2007
- CST@2% WEF:01.08.2008
- 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



Corsan Conviam Construccion S.A.  
 Contractor

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

# The Odisha Gazette



EXTRAORDINARY

PUBLISHED BY AUTHORITY

No. 1942, CUTTACK, TUESDAY, OCTOBER 9, 2012 ASWINA 17, 1934

LABOUR & ESI DEPARTMENT

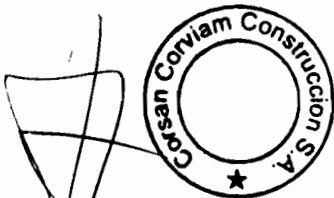
NOTIFICATION

The 6th October, 2012

No.8536-LL-I(AR)-2/12/LESI. —Whereas certain proposals to revise the minimum rates of wages payable to certain categories of employees employed in 83 employments were published as required under clause (b) of sub-section (1) of Section 5 of the Minimum Wages Act, 1948 (11 of 1948) in the Extraordinary issue No. 785, dated the 23rd April, 2012 of the *Odisha Gazette* under the notification of the Government of Odisha in the Labour & E.S.I. Department No.3146-LL-I-(AR) 2/12/LESI., dated the 20th April, 2012 inviting objections and suggestions from all persons likely to be affected thereby within a period of two months from the date of publication of the said notification in the *Odisha Gazette*.

And, whereas, the representations containing objections and suggestions received within the specified period of two months in respect of the said draft have been duly considered by the State Government and the Advisory Board appointed under section 7 of the said Act, has also been consulted.

Now, therefore, in exercise of the powers conferred by clause(b) of sub-section (1) of Section 3 read with Section 4 and sub-section (2) of Section 5 of the said Act and in supersession of all previous notifications issued in this regard the State Government do hereby revise the minimum rates of wages payable to the Unskilled, Semi Skilled, Skilled, Highly Skilled categories of employees employed in 83 employments as mentioned in the schedule to this notification in the whole State to ₹ 150.00, ₹ 170.00, ₹ 190.00 and ₹ 205.00 per day respectively. In the case of Agricultural Sector of the Schedule of employment, ₹126.00 and ₹ 150.00 shall be paid as daily wages to the Non-Ploughing and Ploughing Workers respectively. In addition to the said rate of wages, a special allowance called as Variable Dearness Allowance shall be payable @ ₹ 2.50 (Rupees two and paise fifty) only per day for every 50 point rise in the All India Consumer Price Index Number



Corsan Corviam Construccion S.A.  
Contractor

Volume-I: Page 15 of 97

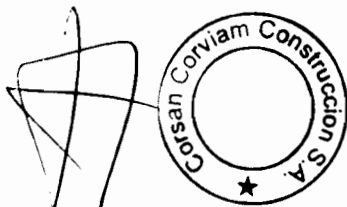
Chief Engineer,  
World Bank Projects, Odisha  
Employment  
Chief Engineer  
World Bank Project  
Of to the E.I.C.(Civil), Odisha  
Bhubaneswar.

(Base 2001-100) for industrial workers or on the expiry of every block period of two years from the date of coming into force of this notification whichever is earlier as may be notified by the Labour Commissioner, Odisha in the official gazette of the State and the same shall be uniformly applicable to the categories of employees specified above to be effective from the date as may be directed by the Labour Commissioner, Odisha in the said notification.

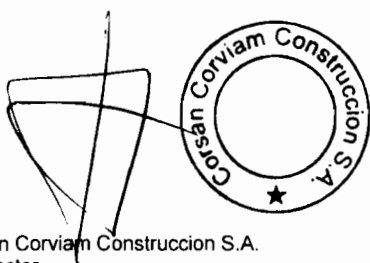
It is further directed that this notification shall come into force on date of its publication in the *Odisha Gazette*.

#### SCHEDULE


Sl. No. (1)	Name of the ESI (2)	Categories of Employees (3)	Proposed minimum rates of wages per day (4)
1	Agriculture		
2	Automobile Servicing, repairing garages and workshops.		
3	Ayurvedic and Unani Pharmacy		
4	Bakeries and Confectionaries including Biscuit making		
5	Bamboo Forest Establishment	<b>Non Agriculture Sector</b>	
6	Brass and Bell metal Industry	Unskilled	₹ 150.00
7	Carpet Weaving Industry	Semi-skilled	₹ 170.00
8	Cashew processing establishments	Skilled	₹ 190.00
9	Cement pipe making and allied products industry	Highly skilled	₹ 205.00
10	Ceramic and Pottery industry		
11	Chemical Industry		
12	Cinema Industry		
13	Clay pottery		
14	Coil Industry		
15	Collection of Sal Seeds		
16	Construction or maintenance of Dams, Embankments, Irrigation Projects and sinking of wells and tanks.	<b>Agriculture Sector</b>	
		Non-ploughing	₹ 125.00
		Ploughing	₹ 150.00
17	Construction or maintenance of roads or in building Operations.		
18	Contingent and Casual employees in Government and other establishments.		
19	Cotton Ginning and Pressing Industry		



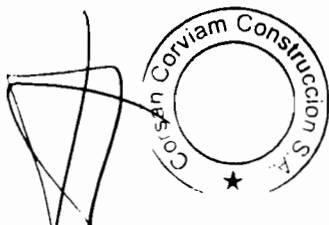
(1)	(2)	(3)	(4)
20	Dispensary of Medical Practitioner in any establishment of medical consultant or in any Chemical or Pathological Laboratory.		
21	Distilleries		
22	Electricity Board		
23	Finishing Dyeing of yarn and fabrics, Painting, Knitting and Embroidery.		
24	Fisheries and Sea food Industry		
25	Forest produce such as Genduli gum, Mahua making of coal and resin.		
26	Foundry Industry with or without attached machine shop.	<b>Non Agriculture Sector</b>	
27	Glass Industries	Unskilled	₹ 150.00
28	Gold and Silver ornaments and articles of artistic design.	Semi-skilled	₹ 170.00
29	Graphite Industry including beneficiation	Skilled	₹ 190.00
30	Handloom and Hosiery	Highly skilled	₹ 205.00
31	Hotels, Eating Houses and Restaurants		
32	Ice Factory and Cold Storage		
33	Jute Industry and Jute Twine Industry		
34	Kendu Leaf collection		
35	Khadi Village Industries including manufacture of Khandasari and other products.		
36	Laundry including dry-washing		
37	Leather Industry		
38	Liquefied Petroleum Gas manufacture and distribution.		
39	Local Authority	<b>Agriculture Sector</b>	
40	Manufacture of brush and brooms	Non-ploughing	₹ 125.00
41	Manufacture of Coke and Burning Coals	Ploughing	₹ 150.00
42	Manufacture of Cold drinks, Soda and other allied products.		
43	Manufacture of Electrical Bulbs		
44	Manufacture of matches, fire works and explosives.		
45	Manufacture of nails and pins		



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

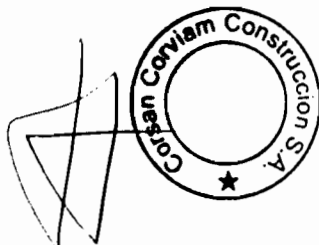
(1)	(2)	(3)	(4)
46	Manufacture of paints and varnishes		
47	Manufacture of plastic products including toys.		
48	Manufacture of Radio by assembling with parts		
49	Manufacture of ropes		
50	Manufacture of Utensils including Aluminum and Hindalium products.		
51	Metal Industry (except the cottage and village scale units).		
52	Minor Engineering Industry (ESI less than 50 persons)		
53	Motor Body Building		
54	Oil Mill	<b>Non Agriculture Sector</b>	
55	Paper and Cardboard Industry	Unskilled	₹ 150.00
56	Petrol and Diesel Oil Pumps	Semi-skilled	₹ 170.00
57	Pharmaceutical Industry	Skilled	₹ 180.00
58	Power Loom Industry	Highly skilled	₹ 205.00
59	Printing Press		
60	Private Road Transport		
61	Private Security Agency and Private Security Services.		
62	Public Health Engineering		
63	Public Motor Transport		
64	Readymade Garments Industries including Mechanized Trade of Readymade Garment Industry.		
65	Refractory Industry		
66	Regulated markets, Marketing Societies, Co-operative Societies and Banks.		
67	Rice Mill, Flour Mill or Dal Mill	<b>Agriculture Sector</b>	
68	Rubber and Rubber Products Industry	Non-ploughing	₹ 125.00
69	Salt Pans	Ploughing	₹ 150.00
70	Saw Mills		
71	Shops and Establishments		
72	Siali Leaf Pluckers		
73	Soap and Detergent Manufactory		
74	Social Forestry		



(1)	(2)	(3)	(4)
75	Spinning Mills		
76	Stone breaking or stone Crushing		
77	Tamarind Collection		
78	Tile and Brick Making		
79	Timber Trading (excluding felling and sawing)		
80	Timber Trading (including felling and sawing)		
81	Tobacco (including Bidi making) Manufactory		
82	Trunks, Suitcase and Bucket Manufactory		
83	Wood works and furniture making industries		

**Explanation:—** for the purpose of this notification:—

1. The minimum rates of wages are all inclusive rates including the basic rates, the cost of living allowances and the cash value of the concessional supply if any of essential commodities.
2. The daily minimum rates of wages shall be inclusive of wages payable for the weekly day of rest.
3. The minimum rates of wages are applicable to employees employed by contractors also.
4. The minimum rates of wages for disabled persons shall be same as payable to the workers of the appropriate category.
5. There shall not be any discrimination between male and female workers in the matters of payment of minimum wages in any category of ESI.
6. (a) "Unskilled" work means work which involves simple operation requiring little or no skill or experience on the job;
- (b) "Semi-skilled" work means work which involves some degree of skill or competence acquired through experience on the job and which is capable of being performed under the supervision or guidance of a skilled employee and includes un-skilled supervisory work;
- (c) "Skilled" work means work which involves skill or competence acquired through experience on the job or through training as an apprentice or in a technical or vocational institute and the performance of which calls for initiative and judgment; and



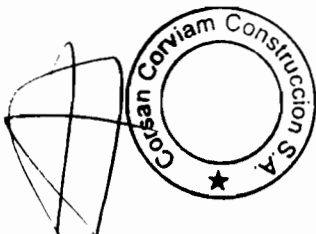
(d) "Highly Skilled" work means work which calls for a high degree of performance and full competence in the performance of certain tasks, acquired through intensive technical or professional training or practices, work experience for long years and also required for workers to assure full responsibility for the judgment or decisions involved in the execution of these tasks.

7. An adult employee shall work for 8 (eight) hours per day excluding half an hour of rest.

By Order of the Governor

C.T.M. SUGUNA

Commissioner-cum-Secretary to Government.



Corsan Corviam Construccion S.A.  
Contractor

A handwritten signature in black ink, appearing to be "Suguna", written over the typed name and title of the Chief Engineer.

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

Reference for Base Index of POL

**Cash/Credit**

**LAXMINARAYAN FILLING STATION**  
 Dealer : Bharat Petroleum Corporation Ltd.

**Barapada, Bhadrak**  
 Phone : 9238104568

Rc. No. - BD  
 TJN No. - 21743900366

V.No. OR-22-E-6755  
 Date 18.04.13

DIESEL	Qty	Rate	Rs.	P.
	20 Ltr	51.54	1030.80	
TAX PAID				
TOTAL			1030.80	

Goods once sold cannot be taken back. Signature

**Cash/Credit** No. **9066**

**M/S.SANIDEV FUELS**

S.H.-53, Mundimara Chhak,  
 Barapada, Bhadrak,  
 Odisha-756113

Name :  
 Vehicle No OR-22B-2123


Explosive Licence No-P/EC/OR/  
 14/1682 (P258207)  
 HSD Licence No-33/2011-12  
 Mob.: 9437087062, 9437087367

Date : 18/4/2013

Sl.No.	Description	Qty.	Rate	Amount
1.	HSD	20	51.54	1030.80
2.	Lubricant			
TOTAL				1030.80

For SANIDEV FUELS

  
 Corsan Corviam Construccion S.A.  
 Contractor

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



## Reference for Base Index of All Commodities

**Name of Commodity : ALL COMMODITIES**

**Type : Group Item**

**Weight : 100**

Month /Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>2013</b>	170.3	170.9	170.1	171.3	<b>171.4</b>	172.7	175.4					
<b>2012</b>	158.7	159.3	161	163.5	163.9	164.7	165.8	167.3	168.8	168.5	168.8	168.8
<b>2011</b>	148	148.1	149.5	152.1	152.4	153.1	154.2	154.9	156.2	157	157.4	157.3
<b>2010</b>	135.2	135.2	136.3	138.6	139.1	139.8	141	141.1	142	142.9	143.8	146

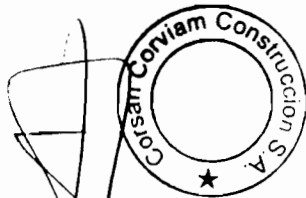
1. Figure 9999.9 may be treated as index for particular item not-available
2. Figures for the latest two months are provisional. Latest two months are to be reckoned with reference to the latest monthly press release issued.

**Senior Economic Adviser,**


Room No. 126-E, Ministry of Commerce and Industry,  
Udyog Bhawan, Rafi Marg, New Delhi - 110 011, INDIA  
Telephone : 91-11-2306 2721 Fax : 91-11-2306 3502  
E-mail to the Senior Economic Adviser

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**Disclaimer**



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Contractor

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


## Reference for Base Index of Construction Machinery

9/7/13

OEA (Office of Economic Advisor)

Monthly Wholesale Price Index

(2001=100)



**Name of Commodity : c. CONSTRUCTION MACHINERY**  
**Type : Group Item**  
**Weight : 0.04457**

Month/Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2013	136.5	136.5	136.7	137	137	136.9	137.1					
2012	131.8	131.8	131.9	132.5	134.4	135.9	135.3	135.6	136	136.3	136.3	136.5
2011	132.6	130.4	131	131	131	131.7	131.6	131.8	131.8	131.8	131.8	131.8
2010	130	130	133	131.9	132.1	132.1	131.6	131.8	131.8	131.8	131.8	131.8


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,  
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Contractor

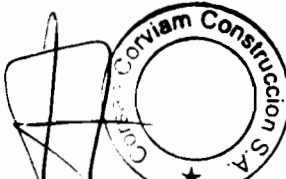
  
 Chief Engineer,  
 World Bank Projects, Odisha  
 World Bank Project Employer  
 O/o the E.I.C.(Civil), Odisha  
 Bhubaneswar.


### Table C. Summary of Payment Currencies

Table: Alternative A

For “Widening & strengthening of existing carriageway to 2-lane for Chandbali-Bhadrak-Anandpur Road(Km.0/0 to Km.45/0 and Km.0/0 to Km. 43/0 of SH-53) Balance Work)”

Name of payment currency	A Amount of currency	B Rate of exchange (local currency per unit of foreign)	C Local currency equivalent $C = A \times B$	D Percentage of Net Bid Price (NBP) $\frac{100 \times C}{NBP}$
Local currency INR	100.00	1.00	100	$100 \times 100 / 100 = 100$ INR
Foreign currency #1				Not Applicable
Foreign currency #2				NA
Foreign currency #				NA
Net Bid Price				248,12,19,385/-
Discount	NIL			nil
Provisional sums expressed in local currency	Nil			nil
<b>BID PRICE</b>				<b>248,12,19,385/-</b>

  
 Corsan Corviam Construction S.A.  
 Contractor

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

## Excise Exemption Certificate



### Declaration Format regarding Customs/Excise Duty Exemption

(For materials to be purchased for consumption on works)

**(CORSAN CORVIAM CONSTRUCCION S.A.)**

**Corporate Office in India:** 02nd Floor, Block Two, Vatika Business Park, Sector – 49, Sohna Road, Gurgaon, Haryana, India Tel.: (+91) 124 482 3200 - Fax: (+91) 124 482 3210

**Head office address:**

Caballero Andante, 8 - 28021 - Madrid, Spain Tel.: (+34) 91 449 3000 - Fax: (+34) 91 449 3829

**To:**

The Chief Engineer,  
World Bank Projects, Odisha O/o the  
E.I.C (Civil), Odisha, Nirman Soudha,  
Unit-V,  
Keshari Nagar, Bhubaneswar, Odisha  
India.

Tel No: 91-674-239 6783  
Fax No: 91-674-239 0080  
E-mail: pmuusrp@gmail.com

**Dear Sir:**

**Ref: Widening & strengthening of existing carriageway to 2-lane for Chandbali-Bhadrak-Anandpur road (Km. 0/0 to Km. 45/0 of SH – 9 and Km. 0/0 to Km. 43/0 of SH – 53)**

**Certificate for Import/Procurement of Goods/Construction Equipment**

1. We confirm that we are solely responsible for obtaining customs/excise duty waivers which we have considered in our bid and in case of failure to receive such waivers for reasons whatsoever, the Employer will not compensate us.
2. We are furnishing below the information required by the Employer for issue of the necessary certificates in terms of the Government of India Central Excise Notification No. 108/95 along with all subsequent amendments including the amendment dt 01-03-2008 and Customs Notification No. 85/99.
3. The goods for which certificates are required is as under



Corsan Corviam Construccion S.A.  
Contractor

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

Items	Make/ Brand Name /Class	Capacity [where applicable]	Quantity	Value	State whether it will be procured locally or imported	Remarks regarding justification for the quantity and their usage in works
<b>Goods</b>						
[a] Bitumen (grade)	IOCL/HPCI/BPC L. or Equivalent		8000 MT	Rs. 36,00,00,000/-		
[b] Emulsion	IOCL/HPCI/BPC L. or Equivalent		1000 MT	Rs. 4,50,00,000		
[c] HSD	IOCL/HPCI/BPC L. or Equivalent		36,00,000 ltr	Rs. 19,00,00,000		
[d] LDO	IOCL/HPCI/BPC L. or Equivalent		10,00,000 ltr	Rs. 4,50,00,000		
[e] Cement	Ultra tech /Ambuja / ACC/Equivalent		45000 MT	Rs. 27,00,00,000		
[f] Steel	Tata/Sail/RINL/ Equivalent		4000 MT	Rs. 18,40,00,000		
[g] Others				Rs. 10,00,00,000		

4. We agree that no modification to the above list is permitted after bids are opened.
5. We agree that the certificate will be issued only to the extent considered reasonable by the Employer for the work, based on the Bill of Quantities and the construction programme and methodology as furnished by us along with the bid.
6. We confirm that the above goods will be exclusively used for the construction of the above work. We are aware that exemption will be issued to only goods/material/equipment which

Corporate Office in India  
 02nd Floor, Block Two, Vatika Business Park, Sector - 49  
 Sohna Road, Gurgaon, Maryana, India  
 Tel. (+91) 124 482 3200 - Fax (+91) 124 482 3210

Head Office address:  
 Caballero Andante, 8 - 28021 - Madrid, Spain  
 Tel (+34) 91 449 3000 - Fax (+34) 91 449 3829  
<http://www.isoluxcorsan.com>



Corsan Corviam Construccion S.A.  
 Contractor

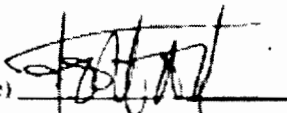
Chief Engineer,  
 World Bank Projects, Odisha  
 World Bank Project Employer  
 O/o the E.I.C.(Civil), Odisha  
 Bhubaneswar.



form part of the work on permanent basis but not for the goods/material/equipment which are used by the contractors for execution of project and after completion of the project, the goods remain with the contractors being owners of such goods for further deployment in other projects.

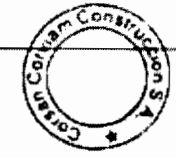
Date: 17.05.2013

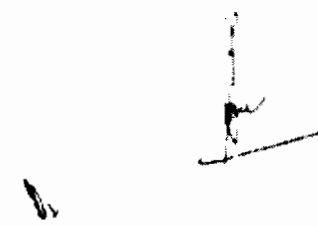
Place: Gurgaon

(Signature) 


(Printed Name) Jose Garrido de Las Heras

(Designation) Authorized Signatory

(Common Seal) 



Corsan Corviam Construccion S.A.  
Contractor

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



POWER OF ATTORNEY

NUMBER TWO THOUSAND FIVE HUNDRED AND TWENTY TWO.....

In Madrid, on the eleventh of August, Two Thousand and Eleven.....

Before me, SANTIAGO-MARÍA CARDELÚS MUÑOZ-SECA, member of the Notary Association of this Capital, with domicile in the same.....

-----APPEARS-----

MR JESÚS SALMERÓN UNTURBE, adult, married, Attorney, established for these purposes in Madrid, Calle Caballero Andante numero 8. Holder of NID/ Fiscal Identification number 3438609-Y.....

-----INTERVENE-----

As Trustee on behalf of the Trading Company called " CORSAN-CORVIAM, CONSTRUCCION S.A" , formerly known as "CONSTRUCCION Y GESTION DE SEVICIOS, S.A ", located in Madrid, Calle Caballero Andante Number 8, Isolux building Corsan; constituted for an indefinite period in this deed authorized by Notary of Madrid, Don Antonio Crespo Monerri, on July 14, 1989, under the order number 2498, and adapted to the current legislation through deed authorized by the same Notary, Mr. Crespo Monerri, on March 27, 1991, under the order number 1,140 . This company adopted its current name and changed its corporate purpose by means of the deed authorized by the Notary of Madrid, Mr Ricardo-Isais Perez Ballarin, dated Oct 16 2002, under the number 153 of his protocol.

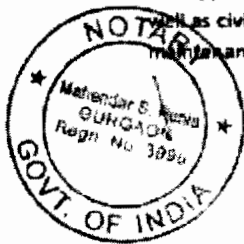
And likewise, it merged its Statutes through deed authorized by the Notary of Madrid, Don Ricardo-Isais Perez Ballarin, on May 12, 2003, protocol number 1079. ....

REGISTERED in the Mercantile Registry of Madrid , in the volume 17,920, book 0, folio 173, section 8, page M-18014, registration number 192, of recasting of Statutes. ....

CF. A-79222709 .....

Changed the registered office to the present one through an authorized deed by the Notary of Madrid, Mr Carlos Moral Carro, on May 12, 2006, under the protocol number 2823 which caused the registration 256 in the sheet of the company.....

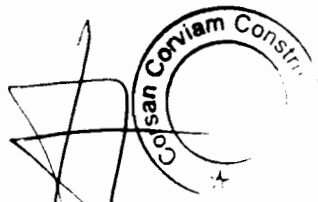
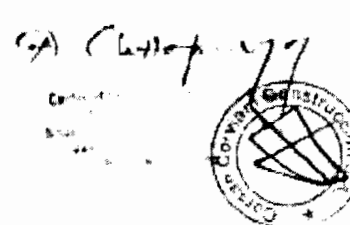
The appearing party expresses that the objective of the company is "general construction, as well as civil works such as building and industrial buildings, carrying out maintenance services, maintenance and reconstruction of real state of in general.....



ATTESTED TO BE TRUE COPY

MAHENDAR S. PURIYA  
ADVOCATE & NOTARY  
31ST GUNGAON (Haryana) India

24 APR 2013



Corsan Cotyiam Construcción S.A.  
Contractor

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



Implementation of Works projects and management of the same, carrying out consultancy activities in the above matters, and carrying out the promotions in real estate activities of all kind".

Acting under powers conferred on them by the Managing Director, Don Antonio Portela Alvarez, by deed authorized by me, on November 27, 2009, under number 3349 of Protocol, which resulted in the registration no. 341 on the sheet of the company in the Mercantile Registry.

Mr Antonio Portela Alvarez is the Managing Director of that company having delegated all powers of the Board of Directors, except those prohibited by law or by-laws, deed authorized by the Notary of Madrid, Don Carlos Moral Carro, on 6th April, 2006 under the number 2165 protocol order number, registration 254 in the sheet of the company.

As per my judgment and under my responsibility, the representative powers accredited presently are sufficient, only when they are empowered for granting powers of attorney and thus the present power of attorney as resulting from the executed copy of the said deed of power of attorney which is shown to me and is guaranteed to me to be in vigor. The appearing party declares that the identification information of the Company that he represents are those which are there in this instrument of power of attorney and other instruments mentioned previously and that the corporate purpose, name, domicile, capacity and legal entity of his represented company have not varied.

I, the Notary, clearly state that I have fulfilled the responsibility of the identification of the beneficial owner imposed by the Law 10/2010 of April 28 whose result appears in the record of the Notary of Madrid, Mr Carlos Moral del Carro on March 2, 2011 under the number 599 of the order of his protocol, the appearing party declaring that the contents of the same have not been modified.

I know the appearing party. I discern that he has the necessary legal capacity for formalizing the present deed of Power of attorney, and to this effect.

GRANT

That in the name and on behalf of "CORSAN-CORVIAM CONSTRUCCION, S.A", CONFERS POWER, as broad and fairly as required by law and is necessary to MR. JOSE GARRIDO DE LAS HERAS, adult, having Spanish Nationality with residence to these effects in C/Caballero 8th Floor, Holder of NID/ Fiscal Identification number 51405634J, so that on behalf of the granting of power company can exercise the followings:

POWERS

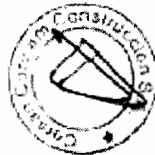


Contract all kinds of work, reconstruction, installations, dealership, supply and lending of ~~contracts~~ including the complete management, work execution and installation and the

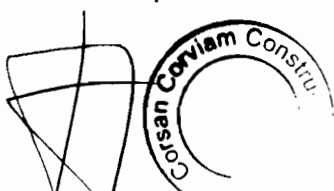
ACCEPTED TO BE TRUE COPY

MARCELO DE JESUS PEREIRA  
ADVOCATE & NOTARY  
JESSE GUERRA (Havana) MD

24 APR 2013



*Handwritten signature and stamp*



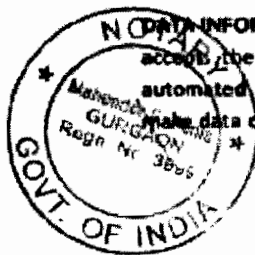
Corsan Corviam Construccion S.A.  
Contractor

*Handwritten signature*  
Chief Engineer,  
World Bank Projects, Odisha  
Employer  
Chief Engineer  
World Bank Project  
C/O the E.I.C.(Civil), Odisha

commercialization as much of the said service as of the products and sub products that it generates, which may have to be carried out in the Spanish Territory or of any other sovereign country, including in the maritime spaces and national and international airspaces with and for all class of peoples and public administration agencies and territorial organization of the respective country including with the Ministry of Defense (Armed Forces), organizations or international institutions; and to do so, participate to direct awarding, competitions and auctions, as well as all kinds of bid whatever may be its procedure, open, restricted or negotiated or, formulating propositions either in word or in writing and, in the case of standoff in the corresponding granting tie, solve it by any of the means permitted by law, including simply bidding; carrying out capacity and solvency statements before the grantors powers and their legal counsels; accept contract awards, agree on them and formalize them, they may already be private or already public; withdraw proposals and desist from awards and contracts, and urge their interpretations, enforcement and resolutions, as well as compromise over them; intervene in the lifting of record resolution and verification of resolution; subscribe valued measurements of work, certifications and provisional, final or definitive liquidations, as well as express observations to the same and challenge them; attend any act of reception or conformity with the fulfillment of the objective of the contracts and demonstrate compliance, objections or reservations and sign the relevant records; appear for arbitration, evaluations and liquidations by termination, suspension, resolution or withdrawal of contracts or non-compliance to the same and collect or pay, where appropriate, the resulting balances, request review and update records following prices for all their paperwork and receive the amounts so that it recognize the Company; encourage, accept and sign contracts and amendments that aimed, either works, services, facilities, supplies, sales; order, agree and sign revised projects, refurbished, additional or complementary, supplementary budgets and conflicting prices, agree with suppliers and subcontractors, and therefore buy all the goods, materials, raw materials, tools, equipment and supplies that require company activities, subcontract all or part of works for which the Company is a contractor and hire the services that such works required, and sign the relevant contracts.---

2. Sign and make up with other natural and legal persons, mergers, joint ventures or other similar associations with objective in order to bid for contracts.

3. And for all the exposed, sign any documents necessary public or private.



NOTARY INFORMATION. In accordance with the law 15/1999, the appearing party is informed and accepts the incorporation of their personal data and the copy of identity document to the automated files of the notary in order to perform the functions of the notarial activity and make data communications under the Act to Public Administrations and, where appropriate, to

MINISTERIO DE FOMENTO  
 MINISTERIO DE ECONOMIA Y HACIENDA  
 MINISTERIO DE TRABAJO Y SEGURIDAD SOCIAL  
 MINISTERIO DE INTERIO

24 APR 2013



*(Handwritten signature)*  
 Mahendra Singh  
 Notary Office



Corsan Cortiam Construccion S.A.  
 Contractor

*(Handwritten signature)*  
 Chief Engineer,  
 World Bank Projects, Odisha  
 Chief Engineer Employer  
 World Bank Project  
 Ofc the E.I.C.(Civil), Odisha  
 Bhubaneswar

the notary who succeeds the present one. The appearing party can exercise their rights of access, rectification, cancellation and opposition in the authorizing Notary.-----

The data will be retained in the Notary confidentially, being protected by the secret of the protocol, without prejudice to the mandatory referrals imposed by current regulations.-----

Hereby I grant ft. I issue the legal notices and disclaimers. Furthermore, in accordance with Article 82 of the Mercantile Registry Regulations, I inform to the appearing party of the obligation to register this document in the appropriate Mercantile Register, I, the notary, certify that I proceed to submit a certified copy of the data transmission to the Mercantile Register for having given the appearing party, as provided in Article 249.2 of Notarial Regulation.-----

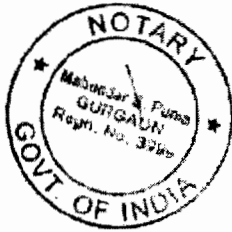
This deed is read by the appearing party at its own discretion and he finds it correct, ratifies its content and signs with me, the Notary, that the consent was freely given and the grant conforms to the law and the duly informed will of the intervening grantor and of all the matters discussed in this public document, issued in four pages of AN series numbers 6413152 and the following three in a sequential order.-----

There is the sign of the appearing party. Initialed. Santiago Maria Cardelus Munoz Seca. Stamped and sealed.-----

FEE APPLICATION-Laws/1989, of April 13, and  
Royal Decree 1426/1989, of November 17  
DOCUMENT WITH NO ASSIGNED VALUE

It is an exact copy of the original where I let it be recorded. And on the insistence of the Grantor Company, I issue it in four pages in the paper used exclusively in the Notarial documents, series and number AN 6412666 and the following four in a sequential order, which I initial, sign, stamp and seal in Madrid, on the fourteenth of September of Two Thousand and Eleven. I DO ATTEST.

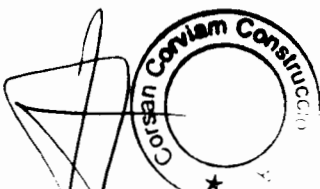
Signature and stamp of the Notary.



ATTESTED TO BE TRUE

24 April 2013

*A. Choudhary*



Corsan Corviam Construccion S.A.  
Contractor

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

This sheet is added for the recording of notes, for the Public Registers and Offices.

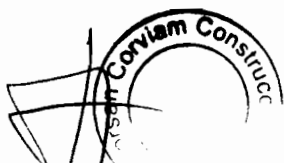
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*(Faint stamp)*



*(Handwritten signature)*

*(Faint text)*

26 APR 2013



Corsan Corviam Construccion S.A.  
Contractor

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

MERCANTILE REGISTRY OF MADRID

The mercantile registrar who signs the prior observation and evaluation of the earlier document in accordance with the article 18 of the commercial law and article 8 of the regulations of the mercantile registry, has decided to proceed with the registration in the:

DOCUMENT PRESENTED 2011/112,216.0

VOLUME: 27,940 FOLIO: 179

LOG: 2,236

SHEET: M-18814

SECTION: 8

REGISTRATION : 376

ENTRY 618

Entity: CORSAN-CORVIAN CONSTRUCCION SA

It certifies the non-inclusion of the person/s named to whom the registration refers to through the entries made in the Register under this document, in the Registry of Bankruptcy Resolutions as provided in Article 61 bis of the Rules of Mercantile Registry.

6<sup>th</sup> Oct 2011, Madrid

The Registrar

Applied the reduction of the R.D.L. 6/1999 and 6/2000

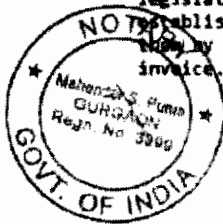
Base: WITHOUT TOTAL SUM

FIFTY SEVEN POINT FIFTY FIVE CENTS

\*\*\*\*\*57.55

In accordance with Articles 333 RH and 80 RRM, it is certified, that as per the computer files of the Registry (Articles 12 and 79 RRM), the registration sheet of the entity is not subject to any registration closing, nor does it constitute an extended entry relative to the declaration of insolvency, voluntary or required, or in the dissolution.

For the purposes of the Organic Law 15/1999, of December 13, for Protection of Personal Information, it is noted that the personal information stated in the title register and those of his representative, have been incorporated into the books of the Register and computerized files that are based on these books, under the responsibility of the registrar. As is consistent with the specific legislation of the Mercantile Registry, it recognizes the rights established in the Organic Law cited above, being able to exercise them by writing to the address listed at the top of the attached invoice.



ATTESTED TO BE TRUE COPY

MAHENDER C. GUPTA  
ADVOCATE & NOTARY  
8811 GUPTA (Mahendras) Prasad

21 APR 2013



*P. C. Castañeda*



Corsan Corvian Construcción S.A.  
Contractor

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

**PROCEEDING.- I, RICARDO ISAIAS PEREZ BALLARIN, Notary of Madrid,**  
**ATTEST:** That the present photocopy consists of SIX pages, the FIRST FIVE are photocopied on both the sides, and this one by its obverse and meant for the present proceeding, made of paper exclusively used in notarial documents, of the same series and numbers and the next five in a sequential order which I sign and seal with that of my notary, and it forms the true and exact reproduction of the original which I refer to, whose original I have and which I return.-----

**Book Number: 1817.**-----

**MADRID, on the third of November of the year Two Thousand and Eleven.**-----

Seal of legitimization and legalization

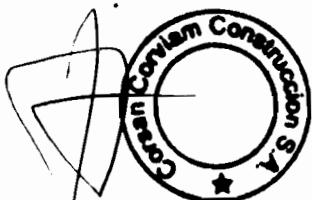
*A. Claffery*  
Notary Public  
State of California  
County of Santa Clara



ATTESTED TO BE TRUE COPY

MARIN MERCEDES  
ADVOCATE & NOTARY  
JISTT GUNGABON (Harvard) India

24 APR 2013



Corsan Corviam Construccion S.A.  
Contractor

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

The present sheet is an addition to the document in which the signature of Mr/Mr. Ricardo-Isaias Perez Ballarin appears.  
Dated 03/11/2011

**APOSTILLE ( or sole legalization)**  
(Convention de la Haya du 5 Octobre, 1961)

1. Country: Spain  
The present public document  
2 Has been signed by  
Mr. Ricardo-Isaias Perez Ballarin  
3. Acting in the capacity of – NOTARY  
4. It bears the seal of that of his Notary

**CERTIFIED**

5. In Madrid                      6. On 7th of November, 2011  
7. By the Dean of the College of Notaries of Madrid.  
8. with number                89898  
9. Stamp/seal                    10. Signature

Mr. Carlos Solis Villa  
Signature of the Dean

**STAMP AND SEAL OF THE NOTARY**

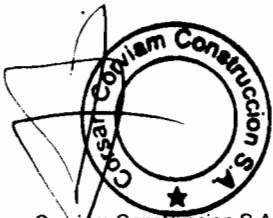


ATTESTED TO BE TRUE COPY

MAHENDER P. VARMA  
NOTARY PUBLIC (Haryana) India

24 APR 2013

*Handwritten signature/initials*



Corsan Corviam Construccion S.A.  
Contractor

*Handwritten signature*  
Chief Engineer,  
World Bank Projects, Odisha  
Chief Engineer Employer  
World Bank Project  
C/O the E.I.C. (Civil), Odisha  
Bhubaneswar

04/2011



AN691828885

GOBIERNO DE MADRID  
Notaría  
Calle Princesa, 10  
28014 MADRID

NÚMERO DOS MIL QUINIENTOS VEINTIDOS. \_\_\_\_\_

En Madrid, a once de agosto de dos mil once. \_\_\_\_\_

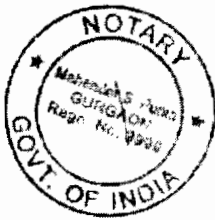
Ante mí, **SANTIAGO-MARÍA CARDELÚS MUÑOZ-SECA**, Notario del Ilustre Colegio de esta Capital, con residencia en la misma,

**COMPARECE**

**DON JESÚS SALMERÓN UNTURBE**, mayor de edad, casado, Abogado, con domicilio a estos efectos en Madrid, calle Caballero Andante número 8. Titular de D.N.I./N.I.F. número 3.438.809-V. —

**INTERVIENE:**

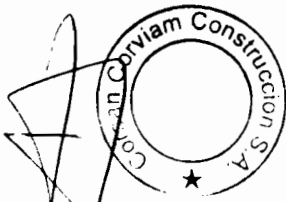
En nombre y representación, como Apoderado de la Compañía Mercantil denominada **"CORSAÑ-CORVIAM, CONSTRUCCIÓN, S.A."**, antes denominada **"CONSTRUCCIÓN Y GESTIÓN DE SERVICIOS, S.A."**, domiciliada en Madrid, Calle Caballero Andante número 8, Edificio Isolux Corsán, constituida por tiempo indefinido, en escritura autorizada por el Notario de Madrid, Don Antonio Crespo Monerri, el día 14 de julio de 1989, bajo el número 2.498 de orden, y adaptada a la legislación vigente mediante escritura autorizada por el mismo Notario, Sr. Crespo Monerri, el día 27 de marzo de 1991, bajo el número 1.140 de orden. Dicha sociedad adoptó su actual denominación y modificó su objeto social mediante escritura autorizada



ACCEPTED TO BE TRUE COPY

*[Signature]*  
2011

24 APR 2011



Corsan Corviam Construccion S.A.  
Contractor

*[Signature]*

Chief Engineer,  
World Bank Projects, Odisha  
Employer  
Chief Engineer  
World Bank Project  
On the E.I.C.(Civil), Odisha  
Rhubangshw



por el Notario de Madrid, Don Ricardo-Isaías Pérez Ballarín, con fecha 16 de octubre de 2002, bajo el número 153 de orden de su protocolo. Y asimismo refundió sus Estatutos mediante escritura autorizada por el Notario de Madrid, Don Ricardo-Isaías Pérez Ballarín, el día 12 de mayo de 2003, número 1079 de protocolo. \_\_\_\_\_

INSCRITA en el Registro Mercantil de Madrid, al tomo 17.920, libro 0, folio 173, sección 8, hoja M-18014, inscripción 192ª, de refundición de Estatutos. \_\_\_\_\_

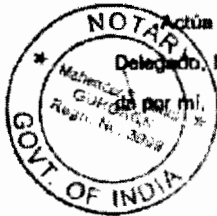
C.I.F. A-79222708. \_\_\_\_\_

Cambiado el domicilio social al actual mediante escritura autorizada por el Notario de Madrid, don Carlos Moral Carro, el día 12 de mayo de 2006, bajo el número 2823 de protocolo, que causó la inscripción 256 en la hoja de la sociedad. \_\_\_\_\_

Manifiesta el compareciente que el objeto de la sociedad es: " Construcción en general, tanto de obras civiles como edificación y edificios industriales, realización de servicios de conservación, mantenimiento y rehabilitación de inmuebles en general. \_\_\_\_\_

Realización de proyectos de obra y dirección de las mismas, realización de actividades de consultoría en las materias anteriores, y realización de promociones de actividades inmobiliarias de todo tipo". \_\_\_\_\_

Actúa en virtud de poder conferido a su favor por el Consejero Delegado, Don Antonio Portela Álvarez, mediante escritura autorizada por mí, el día 27 de Noviembre de 2009, bajo el número 3348 de \_\_\_\_\_



Antonio Portela Álvarez  
24 Nov 2009



Corsan Corviam Construcción S.A.  
Contractor

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

02/2011



AN69128857

protocolo, que causó la inscripción 341 en la hoja de la sociedad en el Registro Mercantil.

Don Antonio Portela Álvarez es el Consejero Delegado de dicha sociedad habiéndose delegado todas las facultades del Consejo de Administración, salvo las indelegables por ley o por los Estatutos, en escritura autorizada por el Notario de Madrid, Don Carlos Moral Carro, el día 6 de abril de 2006, bajo el número 2166 orden de protocolo, inscripción 254ª en la hoja de la sociedad.

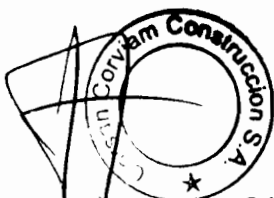
Son a mi juicio y bajo mi responsabilidad suficientes las facultades representativas acreditadas, por cuanto que está facultado para otorgar poderes y por tanto la presente escritura de poder, según resulta de copia autorizada de dicha escritura de poder que me exhibe y me asegura vigente. Manifiesta el compareciente, que los datos identificativos de la sociedad a la que representa son los que constan en dicha escritura de poder y demás escrituras anteriormente mencionadas, y que no ha variado el objeto social, denominación, domicilio, capacidad y personalidad jurídica de su representada.

Yo el Notario hago constar expresamente que he cumplido con la obligación de la identificación del titular real que impone la Ley 10/2010 de 28 de abril cuyo resultado consta en acta por el Notario



ATTESTED TO BE TRUE COPY

MAINTAINED IN THE  
AS PER THE  
21/04/2011



Corsan Corviam Construcción S.A.  
Contractor

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

de Madrid, Don Carlos Moral del Carro el día 2 de marzo de 2011 ,  
bajo el número 509 de orden de su protocolo, manifestando el com-  
petente no haberse modificado el contenido de la misma.-----

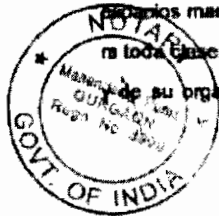
Conozco al competente. Le juzgo con la capacidad legal ne-  
cesaria para formalizar la presente escritura de PODER, y al efecto,

**OTORGA**

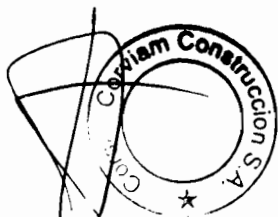
Que en nombre y representación de **CORSÁN-CORVIAM  
CONSTRUCCIÓN,S.A. CONFIERE PODER**, tan amplio y bastante  
como en Derecho se requiera y sea necesario a favor de **DON JOSÉ  
GARRIDO DE LAS HERAS**, mayor de edad, casado, vecino de Ma-  
drid, con domicilio a estos efectos en C/ Caballero Andante número  
8. Titular de DNI/NIF número 51405634J, para que en nombre y re-  
presentación de la sociedad poderdante pueda ejercitar las siguien-  
tes -----

**FACULTADES**


1.- Contratar toda clase de obras, rehabilitaciones, instalacio-  
nes, concreciones, suministros y la prestación de servicios, incluyen-  
do la gestión integral, la explotación de obras e instalaciones y la  
comercialización tanto de dichos servicios como de los productos y  
subproductos que generen, que hayan de realizarse en el territorio  
del Estado Español o de cualquier otro país soberano, incluso en los  
puertos marítimos y aéreos nacionales e internacionales, con y pa-  
ra toda clase de personas y organismos de la administración pública  
de su organización territorial del respectivo país, incluso con el



24 APR 2013



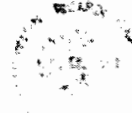
Corsan Corviam Construcción S.A.  
Contractor

  
Chief Engineer,  
World Bank Projects, Odisha  
Employer  
World Bank Project  
the World Bank Project  
Chief Engineer,  
Odisha

02/2011



AN64128658

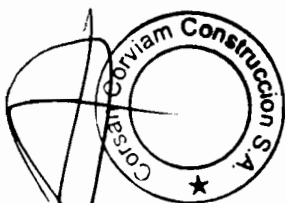


Ministerio de Defensa (Fuerzas Armadas), organizaciones o instituciones internacionales; y para ello, concurrir a adjudicaciones directas, concursos y subastas, así como a toda clase de licitaciones cualquiera que sea su procedimiento, abierto, restringido o negociado, formulando proposiciones bien de palabra ya por escrito y, en caso de empate en la adjudicación correspondiente, resolverlo por cualquiera de los medios permitidos por la ley, incluso pujas a la lla-  
 na; realizar declaraciones de capacidad y solvencia antes los poderes adjudicadores y sus asesorías jurídicas; aceptar adjudicaciones de contratos, convenirlos y formalizarlos, ya sean privados, ya públicos; retirar proposiciones y desistir de adjudicaciones y contratos, e instar sus interpretaciones, cumplimiento y resoluciones, así como transigir sobre ellos; intervenir en el levantamiento de actas de replanteo y de comprobación de replanteo; suscribir mediciones valoradas de obra, certificaciones y liquidaciones provisionales y finales o definitivas, así como manifestar observaciones a las mismas e impugnarlas; asistir a todo acto de recepción o conformidad con la realización del objeto de los contratos y manifestar conformidad, reparos o reservas y firmar la actas correspondientes; comparecer a la práctica de mediciones, valoraciones y liquidaciones por terminación,



ATTESTED TO BE TRUE COPY

24 APR 2013



Corsan Corviam Construcción S.A.  
Contractor

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

suspensión, resolución o desistimiento de contratos dando o no conformidad a las mismas y percibir o pagar, en su caso, los saldos resultantes; solicitar revisión y actualización de precios siguiendo los expedientes por todos sus trámites y percibir las cantidades que por ello se reconozcan a la Empresa; instar, aceptar y suscribir modificaciones de contratos y de aquello que tengan por objeto, ya sean obras, servicios, instalaciones, suministros, ventas; pedir, convenir y firmar proyectos modificados, reformados, adicionales o complementarios, presupuestos adicionales y precios contradictorios; convenir con proveedores y subcontratistas, y por tanto comprar todas las mercancías, materiales, materias primas, utensilios, instalaciones y aprovisionamientos que requieran las actividades sociales, subcontratar total o parcialmente obras de las que la Sociedad sea contratista y contratar los servicios que dichas obras requieran, y firmar los contratos correspondientes. \_\_\_\_\_

2.- Firmar y constituir con otras personas físicas y jurídicas, consorcios, uniones temporales de empresas u otras agrupaciones similares con objeto de concurrir a licitaciones. \_\_\_\_\_

3.- Y para todo expuesto firmar cuantos documentos públicos o privados sean necesarios. \_\_\_\_\_

**INFORMACIÓN DE DATOS.-** De acuerdo con lo establecido en la Ley Orgánica 15/1999, el compareciente queda informado y acepta la incorporación de sus datos personales y la copia del documento de identidad a los ficheros automatizados existentes en esta Notaría





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APPROVED BY THE NOTARY

24 APR 2013



  
Corsan Corviam Construcción S.A.  
Contractor

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

6942011



ANN69112868



con la finalidad de realizar las funciones propias de la actividad notarial y efectuar las comunicaciones de datos previstas en la Ley a las Administraciones Públicas y, en su caso, al Notario que suceda al actual en la plaza. El compareciente puede ejercitar sus derechos de acceso, rectificación, cancelación y oposición en la Notaría autorizante. \_\_\_\_\_

Los datos se conservarán en la Notaría con carácter confidencial, al estar amparados por el secreto del protocolo, sin perjuicio de las remisiones de obligado cumplimiento impuestas por la normativa vigente. \_\_\_\_\_

Así lo otorga. Hago las advertencias legales pertinentes. Asimismo, y de conformidad con el artículo 62 del Reglamento del Registro Mercantil, advierto al compareciente de la obligación que tiene de inscribir este documento en el correspondiente Registro Mercantil, haciendo constar Yo el Notario que no procedo a remitir copia autorizada telemática al Registro Mercantil por haber renunciado el compareciente, conforme a lo establecido en el artículo 249.2 del Reglamento Notarial. \_\_\_\_\_

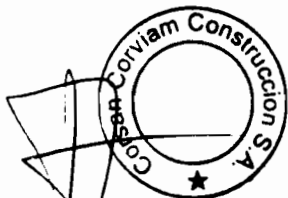
Leída esta escritura por el compareciente, a su elección, la encuentra conforme, se ratifica en su contenido, consiente y la firma



ATTESTED TO BE TRUE COPY

MAHENDER S. PHILIA  
ADVOCATE & NOTARY  
DISTT GORGAWN (Paranah) India

25.11.2011



Corsan Corviam Construcción S.A.  
Contractor

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



99/2011



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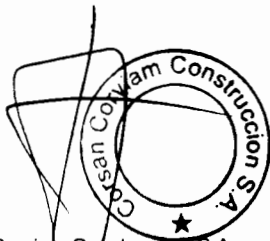
El presente folio se añade para la consignación de notas, por los registros y oficinas públicas



ATTESTED TO BE TRUE COPY

MANAGER, ADVANCE OFFICE, DIST. HIRASAB (MURBA) MR.

7 FEB 2011



Corsan Corviam Construcción S.A.  
Contractor

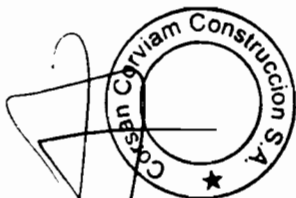
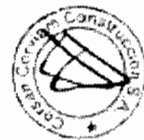
  
Chief Engineer,  
World Bank Projects, Odisha  
Chief Engineer,  
World Bank Project Employer  
O/o the E.I.C.(Civil), Odisha  
Bhubaneswar.





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1



Corsan Corviam Construccion S.A.  
Contractor



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

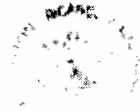


REGISTRO MERCANTIL DE MADRID  
ANº 188650

EL REGISTRADOR MERCANTIL que suscribe previo examen y verificación del documento precedente de conformidad con los artículos 18 del Código de Comercio y 8 del Reglamento del Registro Mercantil, ha resuelto proceder a su inscripción en el

DOCUMENTO PRESENTADO	2011/ 112.216,0
IMPORTE	2.236
ASIENTO	919

TOMO: 27.848 FOLIO: 179  
SECCION: 8 HOJA: M-18014  
INSCRIPCION: 376



Entidad: **CORSAN-CORVIAM CONSTRUCCION SA**

Se hace constar la no inclusión de la/s persona/s nombrada/s a que se refiere la inscripción practicada en este Registro en virtud de este documento, en el Registro de Resoluciones Concursales conforme a lo dispuesto en el artículo 61 Bis del Reglamento del Registro Mercantil

Madrid, 06 de OCTUBRE de 2.011

EL REGISTRADOR



Aplicada la Reducción de los R.D.L. 5/1999 y 6/2000  
BASE: SIN CUANTIA  
CINCUENTA Y SIETE CON CINCUENTA Y CINCO CÉNTIMOS  
\*\*\*\*\*57,55

De conformidad con los artículos 333 RM y 90 RRM, SE HACE CONSTAR, que según resulta de los archivos informáticos del Registro (artículos 12 y 75 RRM), la hoja registral de la entidad no se halla sujeta a carga registral alguna, ni en la misma consta entendido asiento relativo a declaración de concurso, voluntario o necesario, o disolución.

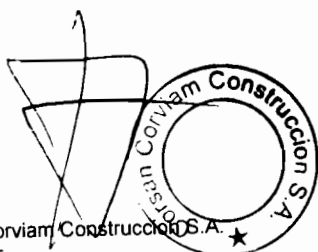
A efectos de la Ley Orgánica 15/1999, de 13 de diciembre, de Protección de Datos de Carácter Personal, se hace constar que los datos personales aparecidos en el título inscribible y los de su presentación, han sido incorporados a los libros de este Registro y a los ficheros informáticos que se llevan en base a dichos libros, cuya responsabilidad es del registrador. En cuanto resulte compatible con la legislación específica del Registro Mercantil, se recurre a los intermedios los derechos establecidos en la Ley Orgánica citada, pidiendo ejercitarlos dirigiendo un escrito a la dirección que figura en el encabezamiento de la factura adjunta.



MAHESHWAR K. GUNGADRI

NOTARY PUBLIC

24 APR 2013



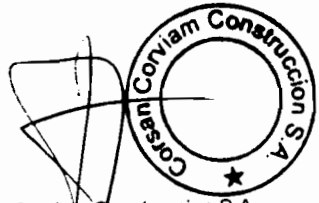
Corsan Corviam Construcción S.A.  
Contractor

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

DILIGENCIA.-Yo, RICARDO ISAIAS PEREZ BALLARIN, Notario de Madrid, DOY FE: Que la presente xerocopia compuesta de SEIS folios, xerografiados por sus dos caras los CINCO PRIMEROS, y éste por su anverso y destinado a la presente diligencia, hecha en papel exclusivo para documentos Notariales, de serie y números el presente y los cinco siguientes en orden correlativo, los cuales rubrico y sello con el de mi notaria, forman la fiel y exacta reproducción de su original a que me remito, cuyo original tengo a la vista y devuelvo. \_\_\_\_\_  
 Numero del libro indicador: 1817. \_\_\_\_\_  
 MADRID, a tres de noviembre de dos mil once. \_\_\_\_\_



ATTESTED TO BE TRUE COPY  
 MAHENDER S. PUNIA  
 ADVOCATE & NOTARY  
 48711 GURUGRAM (Haryana) India  
 24 APR 2013



Corsan Corviam Construccion S.A.  
 Contractor

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



El presente folio es el agregado al documento en el que figura la firma de  
 D./D<sup>a</sup> D. Ricardo-Luis Pérez Ballarín  
 de fecha 03/11/2011

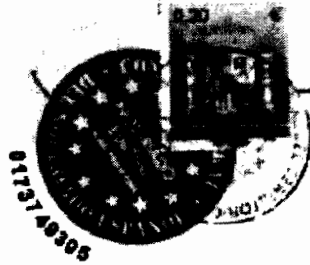


Apostilla (o legalización única)  
 ( Convención de La Haya du 5 octobre 1961 )

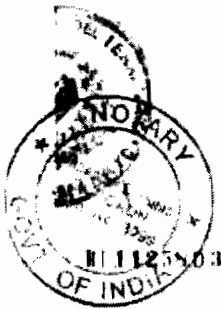
1. País: España
2. El presente documento público
3. Ha sido firmado por  
D. Ricardo-Luis Pérez Ballarín
4. Actuando en calidad de NOTARIO
5. Se heña sellado/firmado con el de su Notaría

**CERTIFICADO**

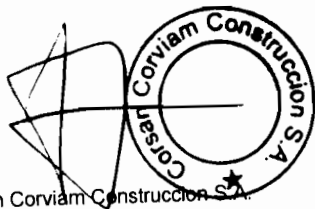
5. En Madrid    6. El 7 de Noviembre de 2011
7. Por el Decano del Colegio Notarial de Madrid
8. Con el número    **89898**
9. Sello/timbre    10. Firma:



Don Carlos Solís Villa  
 Firma delegada del Decano

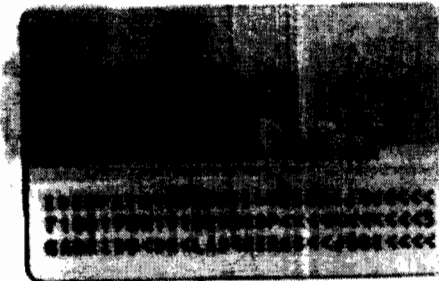
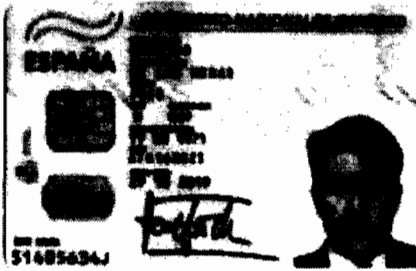


ATTESTED TO BE TRUE COPY  
 YV  
 ANSHENDER S. PUNIA  
 ADVOCATE & NOTARY  
 ANETI GURUPARAN (Muzumbar) India  
 24 APR 2013



Corsan Corviam Construcción S.A.  
 Contractor

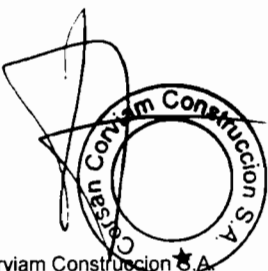
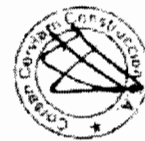
Chief Engineer,  
 World Bank Projects Odisha  
 Chief Engineer Employer  
 World Bank Project  
 O/o the E.I.C.(Civil), Odisha  
 Bhubaneswar.



ATTESTED TO BE TRUE COPY

MAHENDER S. PUNIA  
ADVOCATE & NOTARY  
REGN. NO. 3849

24 APR 2013



Corsan Corviam Construction S.A.  
Contractor

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

**BOARD RESOLUTION**

*[State stamp duty paper]*

**AX5370863**

10/2011

*[Round stamp: Carlos del Moral Carro, Notary's Office]*

*[Square stamp: Carlos del Moral Carro Notary, c/ Serrano 38, 2º - Tel: 91 576 25 17 - Fax: 91 576 1981- 28001 Madrid]*

**DEED TO RAISE THE CORPORATE RESOLUTIONS TO THE STATUS OF A PUBLIC DOCUMENT executed by the company "CORSAN-CORVIAM CONSTRUCCION, S.A."**

**NUMBER TWO THOUSAND NINE HUNDRED AND EIGHT.**

In Madrid, on the eighteenth of July of the year thousand and twelve.

Before me, **CARLOS DEL MORAL CARRO**, Notary of the Illustrious Association of Notaries of this Capital,

**APPEARS:**

**MR. JUAN FRANCISCO FALCÓN RAVELO**, of age, of Spanish nationality, married, a Lawyer, residing for this purpose in 28002 Madrid, calle Principe de Vergara, 187. Holder of the National/Tax Identification Card number 42806815-C.

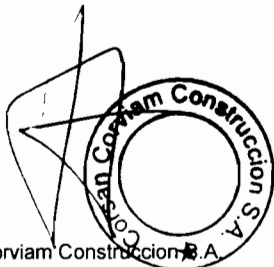
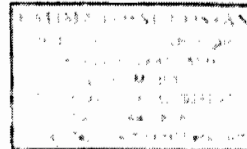
**WITNESSETH:** on behalf and in his capacity as Secretary Non-member of the Board of Directors of the Company **CORSAN-CORVIAM CONSTRUCCION, S.A.**, with registered address in 28021 Madrid, calle Caballero Andante 8, and Tax Identification Card number A79222709.



ATTESTED TO BE TRUE COPY

MARIE DORIS PLUMIER  
ADVOCATE & NOTARY  
18871 40 00 000 (Madrid) Spain

24 APR 2013



Corsan Corviam Construcción S.A.  
Contractor

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

**Legal Personality of the mentioned Company:** It was founded perpetually by means of the deed executed in Madrid before the Notary Mr. Antonio Crespo Monerri on the fourteenth of July of the year one thousand nine hundred and eighty-nine, under number 2498 of his record book. It was adapted to the new legislation by means of deed executed before the same Notary Mr. Crespo Monerri on the twenty-seventh of March of one thousand nine hundred and ninety-one, under number 1140 of his record book and its bylaws have been rewritten by means of deed executed before the Notary of Madrid Mr. Ricardo Isaias Pérez Ballarín on the twelfth of May two thousand and three under number 1079 of his record book.

The Company is REGISTERED with the Madrid Company's Register in Volume 17.920, Folio 186, Section 8, Page number M-18014, entry 192<sup>nd</sup> of recasting.

**Legal Capacity of the Appearing Party:** He is particularly empowered for this act as Secretary Non-member of the mentioned company, by means of resolution of the Company's Board of Directors dated February 1, 2005, which was converted into public document by means of deed executed before me on February 2, 2005 under number 599 of my record book.

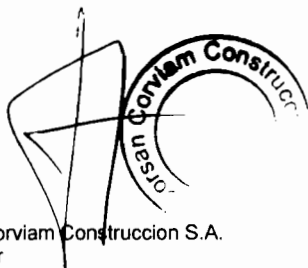
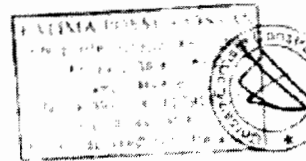
He states that the identification details of the legal persons he represents have not changed and that he still holds the same position.

He is particularly empowered for this act by means of decision of the Board of Directors, according to section 248 of the Companies Act, with effect as of July 12, 2012, as he proves to me by means of certificate which I attach to this master document

(written in double column in English and Spanish) and which was issued by Mr. Juan Francisco Falcón Ravelo, in his capacity as Secretary, with the Approval of the



ATTENCIÓN: COPIA VERDADERA  
 INDEPENDENT VERIFICATION  
 AUTHORITY  
 BSI 17 (2012) (UK) (Management Syst.)  
 24 APR 2017



Corsan Corviam Construcción S.A.  
 Contractor

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

Chairman Mr Francisco José Garcia Martin, whose signatures I know and I authenticate.

By virtue of section 4 of the Act 10/2010, of April 29, the Company's representative states that the members, legal or natural persons, with a shareholding higher than 25% and controlling the company, are those persons appearing on the deed executed before me, Mr Carlos del Moral Carro, on March 2, 2011, under number 599 of my record book.

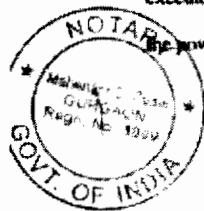
He expressly declares that there was any change in the shareholding composition for the purposes of the abovementioned Act.

I attest that the appearing party is known to me according to section 23, paragraph c) of the Notaries Act.

In accordance with Organic Act 15/1999 of Personal Data Protection, the appearing party is informed and accepts the incorporation of his personal data in the automated files existing in this Notary Office; data that will be maintained therein confidentially without prejudice to any obligatory references to Public Authorities imposed by legislation in force and, if appropriate, to the Notary succeeding the existing one in his post. The purpose is to execute this deed, its invoicing and further follow-up and the corresponding duties of the notarial activity. The details and address of the person that is responsible are as follows: Carlos del Moral Carro, 28001 Madrid, c/ Serrano n° 38.

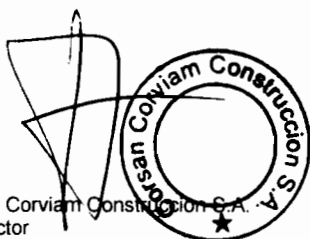
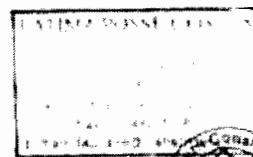
I consider the appearing party possesses, as he acts, the necessary legal capacity to execute this deed to raise into public document the corporate resolutions by means of

the power given in the certificate registered, whereby he



ATTESTED TO BE TRUE COPY EXECUTES  
MAHENDER S. PUNIA  
ADVOCATE & NOTARY  
GOVT. GUJARAT (FAM/NOTES) 2008

20.10.2019



Corsan Corviam Construction S.A.  
Contractor

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



That, by means of this deed, he converts into public document the resolution "TWO" of the Meeting of the Board of Directors of the Company named **CORSAN-CORVIAM CONSTRUCCION, S.A.**, with effects as of July 12, 2012 as it appears in the certificate attached hereto, whose text is considered to be wholly and literally reproduced herein in order avoid unnecessary repetitions.

And by virtue thereof:

The **POWER OF ATTORNEY DEED** in favour of Mr José Garrido de las Heras, which is mentioned in the attached certificate, is **HEREBY RATIFIED**.

#### AUTHORIZATION

I make the appropriate legal reservations and warnings.

After the appearing party reads this deed, at his choice, and with my consent, and once he knows its contents, he ratifies its contents and signs it with me, the Notary, who attests to the contents of this public deed issued on three sheets of stamped paper for exclusive use for notarial documents, series AX, numbers 5371333, 5371334 and this one. The signature of the appearing party appears. The sign, signature, flourish and stamp of the Notary appear

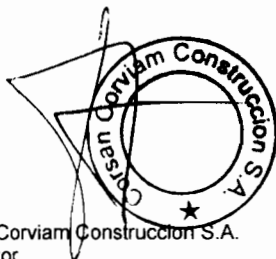
#### DOCUMENTS ATTACHED



*Translator's note: The following two pages have not been translated by me, since they are already written in the languages English and Spanish. The translator does not assume any responsibilities therefor.*

**MAHENDER S. PUNIA**  
ADVOCATE & NOTARY  
BEST BUREGAIN (MAYURA) INDIA

24/7/2013



Corsan Corviam Construcción S.A.  
Contractor

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

10/2011



Don Francisco Felde Ravala, gerente de Inventario Nacional de Identidad 41.006.815-C, como Secretario no miembro del Consejo de Administración de la sociedad CORSA-CORVIAM CONSTRUCCION, S.A., inscrita inscrita en el Registro Mercantil de Madrid al Tomo 17.920, Folio 173, Sección II, Hoja M-18.014, con N.I.F. A-79.222.789 y con domicilio social en C/ Caballero Andante 8, 28021, Madrid (la "Compañía")

Mr. Juan Francisco Felde Ravala, with Spanish tax identification number A-84527539, Secretary non-member of the Board of Directors of CORSA-CORVIAM CONSTRUCCION, S.A., duly registered with the Commercial Registry of Madrid (under Volume 17,920, Section II, Page 173, sheet number M-18,014, tax identification number A-79.222.789) with registered address at C/ Caballero Andante 8, 28021, Madrid (the "Company")

CERTIFICA

CERTIFIES

Que el Consejo de Administración de la Sociedad, en reunión por escrito de todos sus miembros, entre los, D. Francisco José García Martín, D. Luis Emilio Herra, D. José García Calvo, D. Ángel Ramón Martínez-Martín, D. Fernando Caballero Fernández y D. Antonio Portela Álvarez, siguiendo el procedimiento previsto en el artículo 248 de la Ley de Sociedades de Capital, al no haberse opuesto a dicho procedimiento ningún miembro del Consejo de Administración, acordó por unanimidad, entre otros, los siguientes acuerdos, con efectos al 12 de julio de 2012, y que dichos acuerdos se han sido en su momento inscritos en el registro:

That the Board of Directors of the Company, by written vote without holding a meeting, that is, Mr. Francisco José García Martín, Mr. Luis Emilio Herra, Mr. José García Calvo, Mr. Ángel Ramón Martínez-Martín, Mr. Fernando Caballero Fernández and Mr. Antonio Portela Álvarez, following the procedure provided in article 248 of the Corporate Companies Act, without any member of the Board of Directors objecting, unanimously adopted, among others, the following resolutions, with effects as of 12 July 2012. These resolutions have not been revealed or enacted:

PRIMERO: (-)

FIRST: (-)

SEGUNDO: RATIFICACIÓN DE PODER OTORGADO POR LA SOCIEDAD A D. JOSÉ GARRIDO DE LAS HERAS

SECOND: RATIFICATION OF POWER OF ATTORNEY GRANTED BY THE COMPANY TO MR. JOSÉ GARRIDO DE LAS HERAS

Se acordó por unanimidad ratificar la vigencia y validez de cada uno de los facultades conferidas por la Sociedad, representada por el apoderado de la Sociedad D. José Sebastián Estarce, a D. José Garrido de Las Heras, mayor de edad, de nacionalidad española, nacido con domicilio a más efectos en Madrid, calle Caballero Andante 8 y titular de DNI español número 31485634-J, en vigor, mediante escritura pública de poder otorgada el 11 de agosto de 2011 ante el Notario de Madrid D. Santiago-Maria Cardelino Muñoz-Sosa, bajo el número 1.177 de su protocolo.

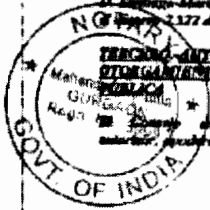
It is unanimously decided to ratify the validity and force of each of the powers conferred by the Company, represented by the Company's attorney Mr. José Sebastián Estarce, to Mr. José Garrido de Las Heras, of legal age, of Spanish nationality, married, with domicile for this purpose in Madrid, calle Caballero Andante 8, and holder of Spanish identity card number 31485634-J, in force, by means of the power of attorney public deed of annotated before the Notary Public of Madrid, Mr. Santiago-Maria Cardelino Muñoz-Sosa, under number 1.177 of its records.

TERCERO: AUTORIZACIÓN PARA EL OTORGAMIENTO DE INSCRIPCIÓN DE

THIRD: AUTHORIZATION FOR THE GRANTING OF PUBLIC DEED

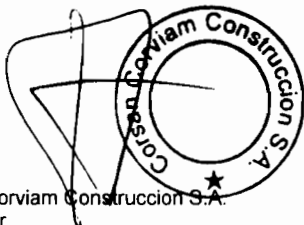
Se acordó por unanimidad autorizar al Presidente del Consejo de Administración de la Sociedad, Sr. Francisco José García Martín,

It is hereby agreed to empower the Chairman of the Board, Mr. Francisco José García Martín,



ATTESTED BY THE TRUSTEES

WAHINDER P. PUNIA  
ADVOCATE & NOTARY  
B-211 RINGROAD (HYDRABAD) INDIA



Corsan Corviam Construcción S.A.  
Contractor

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

como en derecho habiere lugar y de forma expresa al Presidente del Consejo de Administración, D. Francisco José García Martín y al Secretario no miembro del Consejo de Administración, D. Juan Francisco Peleón Revilla, para que comparezcan de oficio, individualmente, en nombre y representación de la Sociedad, puedan comparecer con suscritos y otorgar la o las escrituras públicas que fueren necesarias y que rescriba las anteriores acordadas, así como para otorgar cuantos documentos bien públicos, bien privados, fueren necesarios, hechos iguales de especificación, solemnidad o solemnidad y realicen todos los gestiones, incluyendo la petición de inscripción parcial si una vez fuera posible, todo ello de acuerdo con los artículos 62 y 63 del Reglamento del Registro Mercantil, que se prueban para su completa inscripción en el Registro Mercantil.

and the Secretary non-member of the Board, Mr. Juan Francisco Peleón Revilla, on the other of them may, individually, in the name and on behalf of the Company, appear before a notary public and formulate any public deeds deemed necessary and which may contain the aforementioned resolutions, and to execute any other public and private documents that may be necessary, including acts for the clarification, rectification or amendment of the resolutions, as well as the request for partial registration, or the case may be, in order to ensure registration with the Commercial Registry in accordance with articles 62 and 63 of the Commercial Registry Regulations

Y para que así conste y para cuando el/los suscritos en Derecho procedieren, expido lo presente certificado, en mi calidad de Secretario no miembro del Consejo de Administración, con el Voto Buzón del Presidente del Consejo de Administración.

The above resolutions are certified by the Secretary non-member of the Board of Directors of the Company with the approval of the Chairman of the Board of Directors.

En Madrid, a 12 de julio de 2012.

Madrid, 12 July 2012.

Visto Buzón / With my approval

Fdo./ Signed

D./Mr. Francisco José García Martín

D./Mr. Juan Francisco Peleón Revilla

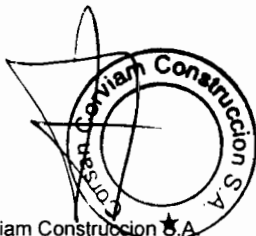
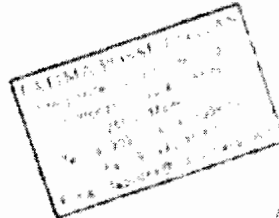
Presidente del Consejo de Administración/  
Chairman of the Board of Directors

Secretario no miembro del Consejo de  
Administración/Secretary non-member of the  
Board of Directors



ATTESTED TO BE TRUE COPY

NOTARY PUBLIC  
J. ANTONIO GARCÍA OCA  
MADRID No. 1926



Corsan Corviam Construcción S.A.  
Contractor

Chief Engineer,  
World Bank Project, Odisha  
Employer

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

PAPER FOR THE USE OF THE PUBLIC NOTARIAL OFFICES  
[State stamp duty paper]

AX5370867

[Round stamp: Carlos del Moral Carro, Notary's Office]

This is a LITERAL COPY OF ITS MASTER DOCUMENT, with which it tallies in number and contents and where I note down the taking of same. It is issued at the request of the principal company on FIVE sheets of paper for exclusive use in notarial documents, series AX, numbers this one and the previous four ones in order. Madrid, on the nineteenth of July of the year two thousand and twelve. I ATTEST.

[Signature Illegible]

[Stamp: Carlos del Moral Carro, Notary's Office, Madrid]

[Stamp: Notarial Authority to Attest Documents, General Board of Spanish Notaries, European Notaries, Number 0182344542]

**APOSTILLE (or sole legalisation)**  
(Convention de La Haye du 5 octobre 1961)  
(Royal Decree 2433/1978, of October 2)

- 1 Country: **SPAIN**
- 2 This public document
- 3 has been signed by **Mr. Carlos del Moral Carro**
- 4 acting in the capacity as **NOTARY**
- 5 bears the seal/stamp of his **NOTARY'S OFFICE**

**CERTIFIED**

6 In <b>Madrid</b>	8. On <b>July 23, 2012</b>
7. by the Dean of the Association of Notaries of Madrid	
9 No. <b>66502</b>	
9 Seal / Stamp	10. Signature [Illegible signature] <i>Mr. Luis Fernando Muñoz de Dios Sáez</i> On behalf of the Dean

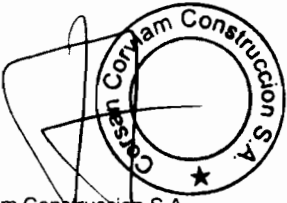
[Stamp: Notarial Authority to Attest Documents, General Board of Spanish Notaries, European Notaries, Number 0178236004]



ATTESTED TRUE COPY  
[Illegible text]



24 APR 2013

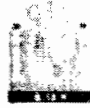


Corsan Corviam Construcción S.A.  
Contractor

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



17201



AX5370863  
CARLOS DEL MORAL CARRO  
NOTARIO  
C/ Serrano, 88, 2º  
Tel. 91 576 26 17 - Fax 91 576 19 80  
28001 MADRID

ESCRITURA DE PROTOCOLIZACIÓN DE ACUERDOS

SOCIALES otorgada por la compañía mercantil:

"CORSAÑ-CORVIAM CONSTRUCCIÓN, S.A.", -----

NUMERO DOS MIL NOVECIENTOS OCHO. -----

EN MADRID, a dieciocho de Julio de dos mil doce. -----

ANTE MI, CARLOS DEL MORAL CARRO, Notario de esta Capital y de su Ilustre Colegio, -----

COMPARECE

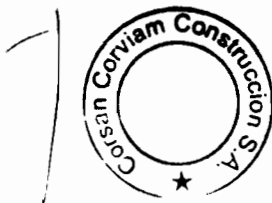
DON JUAN FRANCISCO FALCÓN RAVELO, mayor de edad, de nacionalidad española, casado, Abogado, con domicilio profesional en 28002, Madrid, calle Príncipe de Vergara, número 187. Con Documento Nacional de Identidad e Identificación Fiscal Número 42806815C. -----

INTERVIENE en nombre y representación, como Secretario no Consejero del Consejo de Administración de la sociedad "CORSAÑ-CORVIAM CONSTRUCCIÓN, S.A.", domiciliada en la calle Caballero Andante, número 8, de 28021 Madrid; y con Número de Identificación Fiscal Número: A-

ATTESTED TO BE TRUE COPY

MAHENDER S. PUNIA  
ADVOCATE & NOTARY  
BETT BARRISTER (HARYANA) INDIA

24 APR 2013



Corsan Corviam Construcción S.A.  
Contractor

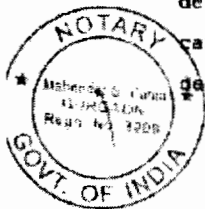
Chief Engineer,  
World Bank Projects Odisha  
Employer  
World Bank Project  
the E.J.C.(Civil), Odisha  
Bhubaneswar.

79222709. ....

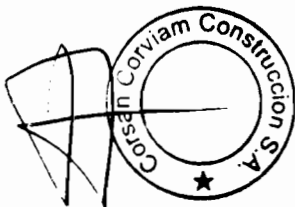
Personalidad jurídica de dicha entidad. Fue constituida por tiempo indefinido mediante escritura autorizada por el Notario de Madrid Don Antonio Crespo Monerri el día catorce de julio de mil novecientos ochenta y nueve, número 2.498 de orden de su protocolo. Adaptada a la vigente legislación en virtud de escritura autorizada por el mismo Notario señor Crespo Monerri el día veintisiete de marzo de mil novecientos noventa y uno, bajo el número 1.140 de orden de su protocolo y refundidos sus estatutos mediante escritura otorgada ante el Notario de Madrid Don Ricardo Isaias Pérez Ballarín el día doce de mayo de dos mil tres, con el número 1.079 de orden de protocolo. ....

INSCRITA en el Registro Mercantil de la Provincia de Madrid, al tomo 17.920, folio 186, sección 8, hoja número M-18014, inscripción 192ª de refundición. ....

Legitimación del Sr. compareciente. Se encuentra facultado para este acto en su calidad de Secretario no Consejero de la citada sociedad, cargo para el que fue nombrado en virtud de decisión del Consejo de Administración de la



ATTESTED TO BE TRUE COPY  
MAHENDER S. PUNIA  
ADVOCATE & NOTARY  
2011 GUWAHATI (Assam) India  
24 APR 2013



Corsan Corviam Construcción S.A.  
Contractor

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

10/2005



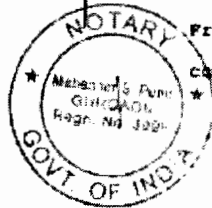
AX5370864

Sociedad de fecha 1 de febrero de 2005, que fue elevada a público en escritura otorgada "ante mí" el día 2 de febrero de 2005, bajo el número 599 de orden de mi protocolo. ....

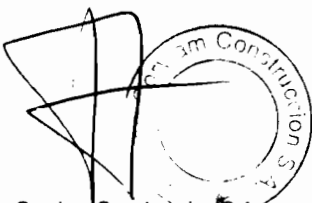
Manifiesta que no han variado los datos de identificación de las personas jurídicas que representa y que continúa en el ejercicio de su expresado cargo. ....

Especialmente facultado para este acto por acuerdo del Consejo de Administración en su reunión, conforme está previsto en la Ley de Sociedades de Capital en su artículo 248, con efectos al día doce de julio de dos mil doce, según me acredita con certificación (redactada a doble columna en inglés y castellano), que me entrega y dejo unida a esta matriz, expedida por Don Juan Francisco Falcón Ravelo, como Secretario, con el Visto Bueno del Presidente Don Francisco José García Martín, cuyas firmas conozco y legítimo. ....

A los efectos de lo dispuesto en el artículo



ATTESTED TO BE TRUE COPY  
K. S. SINGH  
ASSOCIATE & SENIOR  
BETTER BUSINESS OPPORTUNITIES  
24/02/2012



Corsan Corviam Construccion S.A.  
Contractor

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

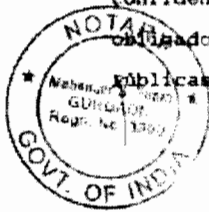


4 de la Ley 10/2010 de 29 de Abril, manifiesta el representante de la sociedad que los socios, personas físicas o jurídicas, titulares de mas de un 25% del capital social y con el control de la sociedad, son las que constan en acta de protocolización otorgada en Madrid, ante mi, Carlos del Moral Carro, el día dos de Marzo de dos mil once, con el número 599 de orden de mi protocolo. ....

Manifiesta expresamente que no se ha producido modificación alguna en la composición accionarial a los efectos de lo dispuesto en la Ley anteriormente citada. ....

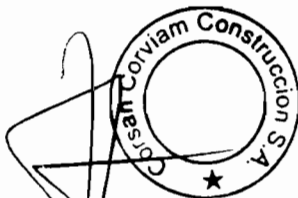
Doy fe de que identifico al compareciente conforme al artículo 23, apartado c), de la Ley del Notariado. ....

Conforme a lo establecido en la Ley Orgánica 15/1999 de protección de datos de carácter personal, el compareciente queda informado y acepta la incorporación de sus datos a los ficheros automatizados existentes en la Notaria, que se conservarán en la misma, con carácter confidencial, sin perjuicio de las remisiones de



obligado cumplimiento a las Administraciones Públicas que estipula la Ley y, en su caso, al

ALBERTO P. TORRES  
ALBERTO P. TORRES  
ALBERTO P. TORRES  
ALBERTO P. TORRES





AX5370865

Notario que suceda al actual en la plaza. Su finalidad es realizar la formalización de la presente escritura, su facturación y seguimiento posterior y las funciones propias de la actividad notarial. La identidad y dirección del responsable son las siguientes: Carlos del Moral Carro, 28001 Madrid, C/ Serrano, n° 38. -----

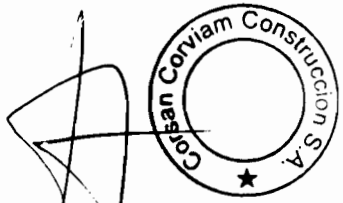
Tiene a mi juicio el compareciente, según interviene, la capacidad legal necesaria para formalizar la presente escritura de protocolización, y al efecto, -----

----- DICE Y OTORGA -----

Que eleva a escritura pública, mediante la presente, el acuerdo "SEGUNDO" la Reunión del Consejo de Administración de la Entidad, "CORSAÑ-CORVIAM CONSTRUCCIÓN, S.A.", de fecha doce de julio de dos mil doce, según consta ese acuerdo en la certificación de la misma fecha unida a esta matriz, cuyo texto se tiene por íntegra y literalmente reproducido en este lugar para evitar repeticiones innecesarias. -----



ATTESTED TO BE TRUE  
2



Corsan Corviam Construcción S.A.  
Contractor

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

En su virtud: -----

Está RATIFICADO el poder otorgado a Don José Garrido de las Heras, que se relaciona en la certificación unida a esta matriz. -----

----- OTORGAMIENTO Y AUTORIZACIÓN -----

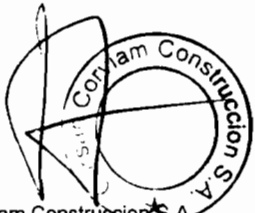
se hacen las reservas y advertencias legales. -----

Lee el compareciente por su elección y con mi consentimiento esta escritura y, enterado de su contenido, la otorga y firma conmigo, el Notario, que doy fe de su contenido y de que va extendida en tres folios de papel timbrado del Estado, exclusivo para documentos notariales, serie AX, números 5371333, 5371334 y el del presente. Está la firma del señor compareciente. Están el signo, la firma, la rúbrica y el sello del Notario autorizante. -----

----- DOCUMENTOS UNIDOS -----



IDENTITY TO BE TRUE COPY



Corsan Corviam Construction S.A.  
Contractor

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



AX6370366

417201

Juan Francisco Falda Revelo, provisto de Documento Nacional de Identidad 42.806.815-C, como Secretario no miembro del Consejo de Administración de la sociedad CORSAÑ-CORVIAM CONSTRUCCIÓN, S.A., sociedad inscrita en el Registro Mercantil de Madrid el Tomo 17.920, Folio 173, Sección 8, Hoja M-18.014; con N.I.F. A-79.222.709 y con domicilio social en C/ Caballero Andante 8, 28021, Madrid (la "Sociedad")

Mr. Juan Francisco Falda Revelo, with Spanish ID identification number A-84523570, Secretary non-member of the Board of Directors of CORSAÑ-CORVIAM CONSTRUCCIÓN, S.A., duly registered with the Commercial Registry of Madrid (under Volume 17,920, Section 8, Page 173, sheet number M-18,014, ID identification number A-79.222.709) with registered address at C/ Caballero Andante 8, 28021, Madrid (the "Company")

**CERTIFICA**

**CERTIFIES**

Que el Consejo de Administración de la Sociedad, en votación por escrito de todos sus miembros, esto es, D. Francisco José García Martín, D. Luis Delso Herras, D. José Gomis Cabete, D. Ángel Serrano Martínez-Borjén, D. Fernando Caballero Fernández y D. Antonio Pontale Álvarez, siguiendo el procedimiento previsto en el artículo 248 de la Ley de Sociedades de Capital, al no haberse opuesto a dicho procedimiento ningún miembro del Consejo de Administración, adoptó por unanimidad, entre otros, los siguientes acuerdos, con efectos al 12 de julio de 2012, y que dichos acuerdos no han sido en ningún momento revocados o enmendados:

That the Board of Directors of the Company, by written vote without holding a meeting, that is, Mr. Francisco José García Martín, Mr. Luis Delso Herras, Mr. José Gomis Cabete, Mr. Ángel Serrano Martínez-Borjén, Mr. Fernando Caballero Fernández and Mr. Antonio Pontale Álvarez, following the procedure provided in article 248 of the Corporate Companies Act, without any member of the Board of Directors objecting, unanimously adopted, among others, the following resolutions, with effects as of 12 July 2012. These resolutions have not been revoked or amended:

PRIMERO: /-/-/

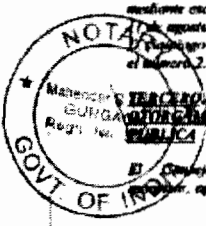
FIRST: /-/-/

SEGUNDO.- RATIFICACIÓN DE PODER OTORGADO POR LA SOCIEDAD A D. JOSÉ GARRIDO DE LAS HERAS

SECOND.- RATIFICATION OF POWER OF ATTORNEY GRANTED BY THE COMPANY TO MR. JOSÉ GARRIDO DE LAS HERAS

Se acordó por unanimidad ratificar la vigencia y validez de cada una de las facultades conferidas por la Sociedad, representada por el apoderado de la Sociedad D. Jesús Salmerón Uteuerbe, a D. José Garrido de Las Heras, mayor de edad de nacionalidad española, casado, con domicilio a estos efectos en Madrid, calle Caballero Andante 8 y titular de DNI español número 51405634-J, en vigor, mediante escritura pública de poder otorgada el día 20 de agosto de 2011 ante el Notario de Madrid D. Santiago-Maria Caraballo Muñoz-Sosa, bajo el número 2.522 de su protocolo.

It is unanimously decided to ratify the validity and force of each of the powers conferred by the Company, represented by the Company's attorney Mr. Jesús Salmerón Uteuerbe, to Mr. José Garrido de Las Heras, of legal age, of Spanish nationality, married, with domicile for this purpose in Madrid, calle Caballero Andante 8, and holder of Spanish identity card number 51405634-J, in force, by means of the power of attorney public deed of execution before the Notary Public of Madrid, Mr. Santiago-Maria Caraballo Muñoz-Sosa, under number 2,522 of his records.



TERCERO.- AUTORIZACIÓN PARA EL OTORGAMIENTO DE ESCRITURA PÚBLICA

THIRD.- AUTHORIZATION FOR THE GRANTING OF PUBLIC DEED

**ATTENDED TO BE TRUE COPY**

El Consejo de Administración acordó por unanimidad, entre otros, los siguientes acuerdos: **ADVOCATE & NOTARY**  
BETTY BURRANH (Marques) India

It is hereby agreed to empower the Chairman of the Board, Mr. Francisco José García Martín



Corsan Corviam Construcción S.A.  
Contractor

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

como en derecho hubiera lugar y de forma expresa, al Presidente del Consejo de Administración, D. Francisco José García Martín y al Secretario no miembro del Consejo de Administración, D. Juan Francisco Falcón Ravels, para que cualquiera de ellos, indistintamente, en nombre y representación de la Sociedad, pudiesen comparecer ante Notario y suscribir las resoluciones públicas que fueran necesarias y que suscriben las anteriores acordadas, así como para otorgar cualquier documento bien público, bien privado, fueran necesarios, forzosos oportunos de ratificación, aclaración o subsanación y realizar todas las gestiones, incluyendo la petición de inscripción parcial si ésta resultara posible, todo ello de acuerdo con los artículos 62 y 63 del Reglamento del Registro Mercantil, que se precisan para su completa inscripción en el Registro Mercantil.

and the Secretary non-member of the Board, Mr. Juan Francisco Falcón Ravels, so that either of them may, indistinctly, in the name and on behalf of the Company, appear before a notary public and formalise any public deed deemed necessary and which may contain the above-mentioned resolutions, and to execute any other public and private documents that may be necessary, including so as for the clarification, rectification or amendment of the resolutions, as well as the request for partial registration, as the case may be, in order to ensure registration with the Commercial Registry in accordance with articles 62 and 63 of the Commercial Registry Regulations.

Y para que así conste y surta efectos eficaces en su derecho procedentes, expido la presente certificación, en mi calidad de Secretario no miembro del Consejo de Administración, con el Visto Bueno del Presidente del Consejo de Administración.

The above resolutions are certified by the Secretary non-member of the Board of Directors of the Company with the approval of the Chairman of the Board of Directors.

En Madrid, a 12 de julio de 2012.

Madrid, 12 July 2012.

Visto Bueno / With my approval

Fdo./Signed:

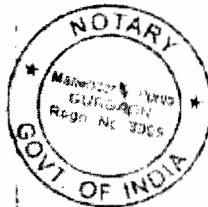



D./Mr. Francisco José García Martín

D./Mr. Juan Francisco Falcón Ravels

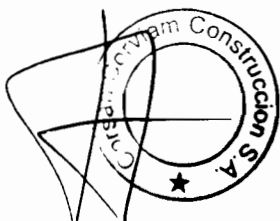
Presidente del Consejo de Administración/  
Chairman of the Board of Directors

Secretario no miembro del Consejo de  
Administración/Secretary non-member of the  
Board of Directors



ATTESTED TO BE TRUE COPY

MAHENDER S. PURI  
ADVOCATE & NOTARY  
2027 GURGAON (HARYANA) INDIA

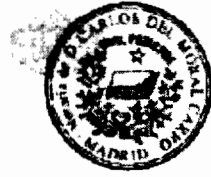


Corsan Corviam Construccion S.A.  
Contractor



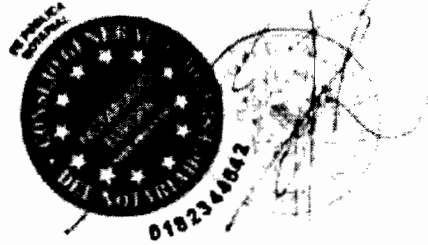
Chief Engineer,  
World Bank Projects, Odisha  
Chief Engineer Employer  
World Bank Project  
O/o the E.I.C. (Civil), Odisha  
Bhubaneswar

07/2011



AX5370867

ES COPIA LITERAL DE SU MATRIZ, con la que concuerda en número y contenido y en donde queda anotada. Para la Sociedad otorgante, la expido en cinco folios de papel exclusivo para documentos notariales de la serie AX, números el presente y los cuatro anteriores en orden. En Madrid, a diecinueve de Julio de dos mil doce. DOY FE.



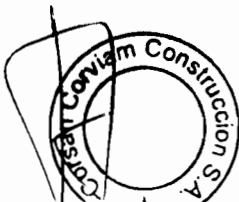
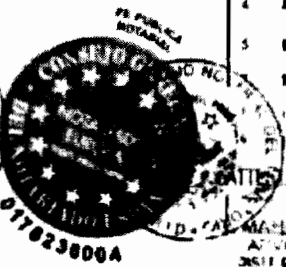
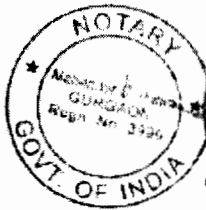
DOCUMENTO SIN CUANTIA

Apellidos y nombre del otorgante  
(Concepto de otorgante)  
(Kind Document)

- País España
- El presente es el número de la matriz de este documento
- Actuando en nombre de D. Carlos del Campo
- Se halla en su Notaría
- En Madrid, a los 19 días del mes de Julio de 2012

66502

MANRIQUER S. FUERA  
ADVOCATE & NOTARY  
CALLE GONGORA 10 - 28014 MADRID

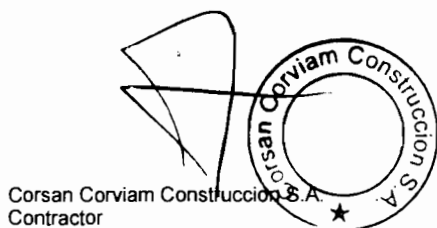


Corsan Corviam Construcción S.A.  
Contractor

Chief Engineer,  
World Bank Projects, Odisha  
Chief Engineer Employer  
World Bank Project  
C/o the E.J.C.(Civil), Odisha  
Ruhana,swar

## ELI - 2: JV Information Sheet

JV / Specialist Subcontractor Information	
Bidder's legal name	NOT APPLICABLE
JV Partner's or Subcontractor's legal name	
JV Partner's or Subcontractor's country of constitution	
JV Partner's or Subcontractor's year of constitution	
JV Partner's or Subcontractor's legal address in country of constitution	
JV Partner's or Subcontractor's authorized representative information (name, address, telephone numbers, fax numbers, e-mail address)	
Attached the Following Documents	Nil



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

## Technical Proposal

- Site Organization
- Method Statement
- Mobilization Schedule
- Construction Schedule
- Equipment
- Others



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Contractor

A handwritten signature in black ink, appearing to be 'S. S. S.', written over the printed name of the Chief Engineer.

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



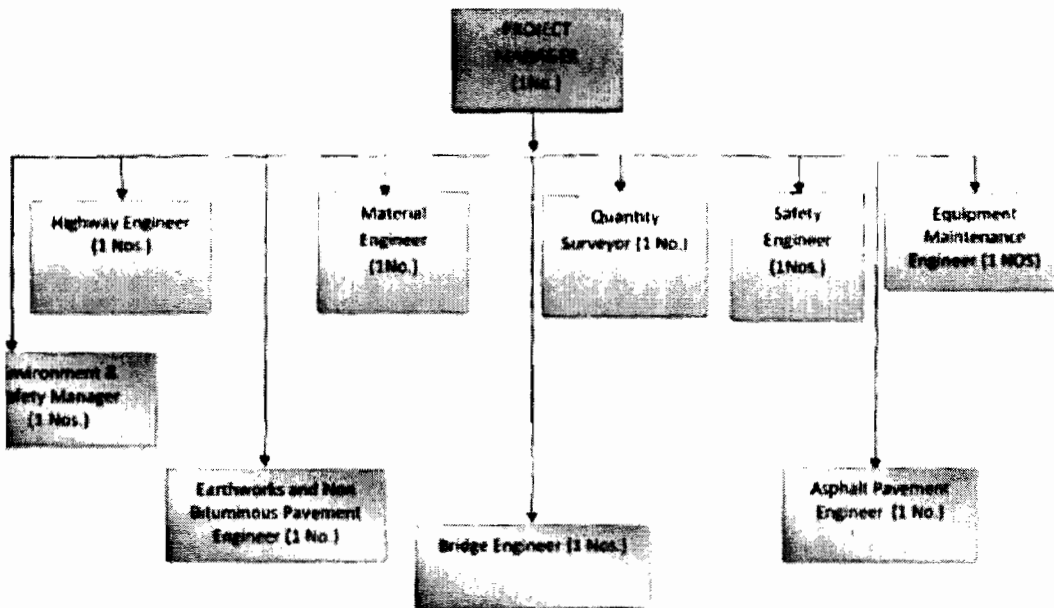
## Site Organization



### SITE ORGANISATION

**“Widening and strengthening of the existing carriageway to 2 lane from Chandbali-Bhadrak-Annapapur (From Km.0/000 to Km. 45/000 of SH-9 and Km 0/000 to Km. 43/000 of SH-53) Balance work.”**

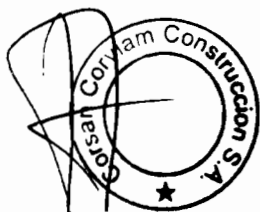
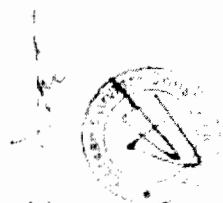
ICB Number- OSRP-BAL-P02



**Note:** The Proposed Manpower is tentative. However adequate Man Power shall be deployed as per Employers Requirement on Award of Contract.

Head Office:  
Cable: RASBANK  
28/21, Mehdi Road

Correspondence Address:  
Old Paper Block, Tando, Vastan Business Park  
Sector- 49, Sohna Road, Gurgaon-122001, Haryana (India);  
Tel. No. (+91) 124 4823 200



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

## Method Statement

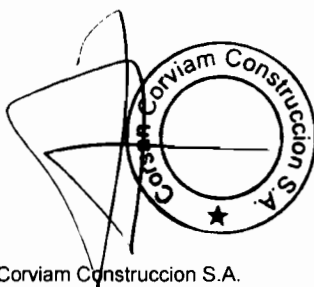
All the items of work shall be executed as per the Conditions, Technical Specifications & drawings provided in Volume II , III & IV of the Contract.

## Environment Management Plan

The EMP guidelines provided in the Technical Specification shall be followed. The detail EMP shall be rolled out as the work progresses, keeping all the activities as per schedule.

## Mobilization Schedule

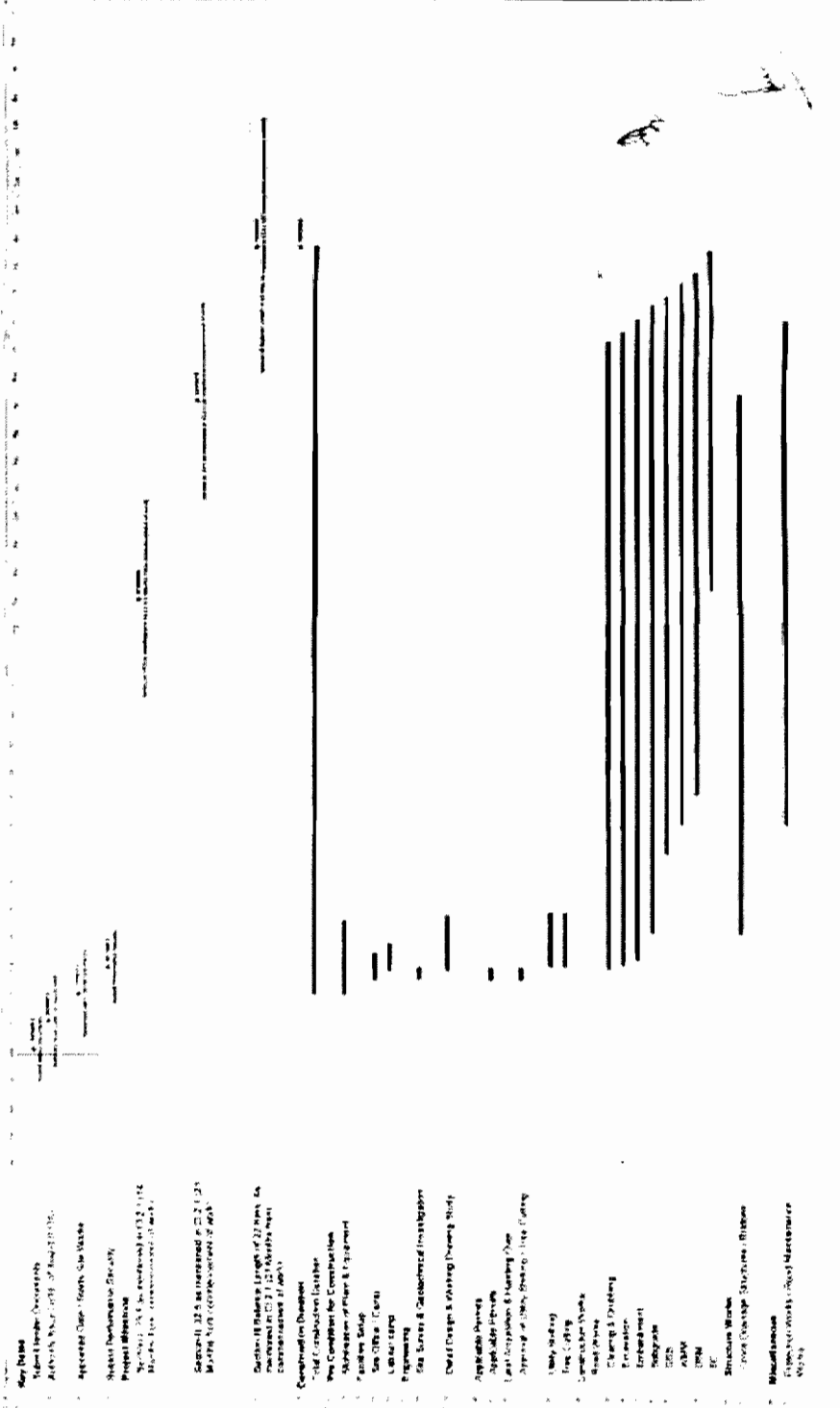
Man Power	Start Date	7 days from Signing Agreement
	Completion Date	50 days from Signing Agreement
Machinery	Start Date	15 days from Signing Agreement
	Completion Date	90 days from Signing Agreement



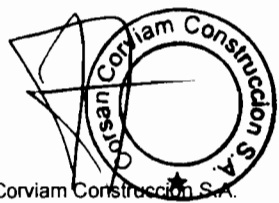
# Construction Schedule

CONSTRUCTION SCHEDULE


Strengthening of existing carriageway to 2 lane for Chandrabali-Bhadraik Anandpur Road (km. 0100 to Km. 4500 of SH - 8 and Km. 0100 to Km. 4500 of SH - 831 (Balance work)



Strengthening of existing carriageway to 2 lane for Chandrabali-Bhadraik Anandpur Road (km. 0100 to Km. 4500 of SH - 8 and Km. 0100 to Km. 4500 of SH - 831 (Balance work)

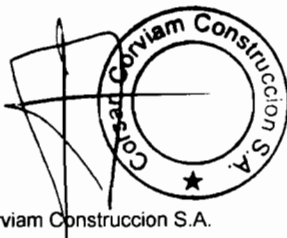


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 World Bank Projects, Odisha  
 Chief Engineer,  
 World Bank Project Employer  
 the E.I.C. (Civil), Odisha  
 Bhubaneswar

## Schedule of Key Equipments as per requirement of Bidding Document

No.	Equipment Type and Characteristics	Minimum Number required
1	Mechanical Bitumen Sensor Paver - 100 TPH	02
2	Motor Grader - 200 cum/Hr	04
3	Hydraulic Excavator - 60 cum/Hr	04
4	Vibratory Roller (Tandem) - 8 T [100 cum/Hr]	05
5	Pneumatic Tyred Roller - 25 cum/Hr	02
6	Hot Mix Plant (Batch Mix only) - 100 TPH	01
7	Concrete Batch-mix Plant - 75 Cum/Hr	01
8	Transit Mixer - 6 cum	06
9	Front End Loader	03
10	Dozer - 150 cum/Hr	01
11	Tipper (of different capacities)	40
12	Cone Crushing Unit - 200 TPH	01
13	Bitumen Sprayer - 1750 sqm/hour	02
14	Earth Compactor -8-10 ton	03
15	Water Tanker - 10 KL	05
16	Mechanical Paver - 100 TPH	01
17	WMM Plant - 175 TPH	01
18	Concrete Pump - 20 cum/hour	02
19	Concrete Fixed Form Paver - 100 TPH	01



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

**PLANTS AND EQUIPMENTS OWNED AND PROPOSED FOR THE PROJECT  
BY M/s Corsan Corviam Construccon S.A,**

1.

Item of equipment:- PAVER FINISHER WITH ELECTRONIC SENSOR -2 No.		
Equipment information	Name of manufacturer: Vogele	Model and power rating Super 1800-2 9AB 600-2 TV)
	Capacity 10 Meters	Year of manufacture 2010
Current status	Current location Surat (India)	
	Details of current commitments : Surat- Hazira port Project.	
Source	Indicate source of the equipment <input checked="" type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	

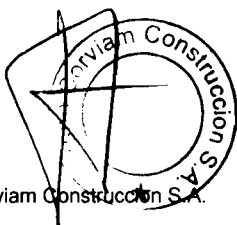
2.

Item of equipment: MOTOR GRADER – 4 Nos.		
Equipment information	Name of manufacturer Volvo	Model and power rating G930 ; 145 kW
	Capacity 155 HP	Year of manufacture 2010
Current status	Current location : Surat (India)	
	Details of current commitments : Surat – Hazira Port Project.	
Source	Indicate source of the equipment <input checked="" type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	

3.

Item of equipment: Hydraulic Excavators - 4 Nos		
Equipment information	Name of manufacturer Komatsu	Model and power rating SAA6D107E-1 155 HP
	Capacity 100 Cum / hour	Year of manufacture 2010
Current status	Current location Surat (India)	
	Details of current commitments Surat – Hazira Port Project.	
Source	Indicate source of the equipment <input checked="" type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	

4.



Item of equipment: Vibratory Roller (Tendom) - 5 Nos		
Equipment information	Name of manufacturer CATERPILLAR INDIA	Model and power rating CB 534 D
	Capacity 10.4 Ton	Year of manufacture 2010
Current status	Current location Surat (India)	
	Details of current commitments Surat – Hazira Port Project.	
Source	Indicate source of the equipment <input checked="" type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	

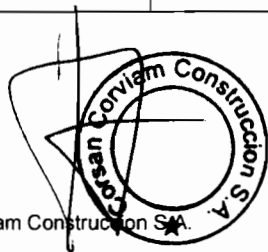
5.

Item of equipment: Pnumatic Tyred Roller - 2 Nos		
Equipment information	Name of manufacturer Volvo	Model and power rating PT 220 RH
	Capacity 21 Ton.	Year of manufacture 2010
Current status	Current location Surat (india)	
	Details of current commitments Surat – Hazira Port Project.	
Source	Indicate source of the equipment <input checked="" type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	

6.

Item of equipment: Hot Mix Plant – 1 No		
Equipment information	Name of manufacturer Linnhoff	Model and power rating MSD 3000
	Capacity 200 TPH	Year of manufacture 2010
Current status	Current location Surat ( India )	
	Details of current commitments Surat – Hazira Port Project.	
Source	Indicate source of the equipment <input checked="" type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	

7.



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

Item of equipment: Batching Plant – 1 No.		
Equipment information	Name of manufacturer Bhai Pumpcrete	Model and power rating BPI 75 TS
	Capacity 75 Cum / Hr.	Year of manufacture 2010
Current status	Current location Surat ( India)	
	Details of current commitments Surat – Hazira Port Project.	
Source	Indicate source of the equipment <input checked="" type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	

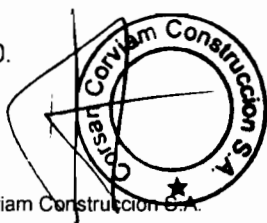
8.

Item of equipment: TRANSIT MIXER – 6 NOS		
Equipment information	Name of manufacturer GREAVES INDIA	Model and power rating GCM 65 XL
	Capacity 06 CUM	Year of manufacture 2010
Current status	Current location SURAT ( INDIA)	
	Details of current commitments SURAT – HAZIRA PORT PROJECT.	
Source	Indicate source of the equipment <input checked="" type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	

9.

Item of equipment: FRONT END LOADER – 3 NO		
Equipment information	Name of manufacturer HITACHI	Model and power rating ZW250 179KW
	Capacity Bucket 2.9	Year of manufacture 2010
Current status	Current location Surat (India)	
	Details of current commitments Surat – Hazira Port Project.	
Source	Indicate source of the equipment <input checked="" type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	

10.



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World Bank Project Employer  
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Item of equipment: DOZER - 1 NO.		
Equipment information	Name of manufacturer Komatsu	Model and power rating Komatsu D80A-12
	Capacity 180 HP @ 1850 rpm	Year of manufacture 2010
Current status	Current location Surat (India)	
	Details of current commitments Surat – Hazira Port Project.	
Source	Indicate source of the equipment <input checked="" type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	

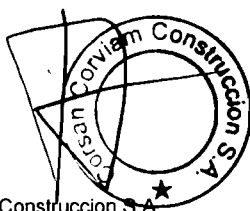
11.

Item of equipment: TRUCK / TIPPER – 40 NOS		
Equipment information	Name of manufacturer Ashok Leyland	Model and power rating Hippo Tipper; 238ps @ 2200rpm
	Capacity 25 Ton	Year of manufacture 2010
Current status	Current location Surat (India)	
	Details of current commitments Surat – Hazira Port Project.	
Source	Indicate source of the equipment <input checked="" type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	

12.

Item of equipment: STONE CRUSHER CUM SCREENING UNIT- 1 NO		
Equipment information	Name of manufacturer Puzzolana	Model and power rating Semi-Mobile
	Capacity 250 TPH	Year of manufacture 2010
Current status	Current location Surat (India)	
	Details of current commitments Surat – Hazira Port Project.	
Source	Indicate source of the equipment <input checked="" type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	

13.





Item of equipment: BITUMEN SPRAYER- 2 Nos.		
Equipment information	Name of manufacturer Ashok Leyland	Model and power rating
	Capacity 23 HP 8000 Ltrs. 19 Nos. Nozzles	Year of manufacture 2010
Current status	Current location Surat (India)	
	Details of current commitments Surat – Hazira Port Project.	
Source	Indicate source of the equipment <input checked="" type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	

14.

Item of equipment: SOIL COMPACTOR - 03 Nos		
Equipment information	Name of manufacturer Hyundai	Model and power rating 770CD 266HP
	Capacity 10 TON	Year of manufacture 2010
Current status	Current location Surat (India)	
	Details of current commitments Surat – Hazira Port Project.	
Source	Indicate source of the equipment <input checked="" type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	

15

Item of equipment: WATER TANKER – 5 NOS		
Equipment information	Name of manufacturer Ashok Leyland	Model and power rating 160 HP @ 2400 rpm
	Capacity 10 KL	Year of manufacture 2010
Current status	Current location Chadheidhara Camp Site	
	Details of current commitments Free	
Source	Indicate source of the equipment <input checked="" type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	

16.

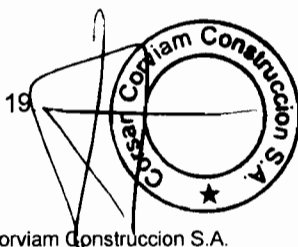
Item of equipment: WMM Paver - 1 No		
Equipment information	Name of manufacturer Apollo	Model and power rating AP 1000
	Capacity Laying Capacity – upto 700 TPH Width -9.56 Meters	Year of manufacture 2010
Current status	Current location Surat (India)	
	Details of current commitments Surat – Hazira Port Project.	
Source	Indicate source of the equipment <input checked="" type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	

17.

Item of equipment: WMM Mixing plant – 1 No		
Equipment information	Name of manufacturer Apollo	Model and power rating WM 175
	Capacity 175 TPH	Year of manufacture 2010
Current status	Current location Surat (India)	
	Details of current commitments Surat – Hazira Port Project.	
Source	Indicate source of the equipment <input checked="" type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	

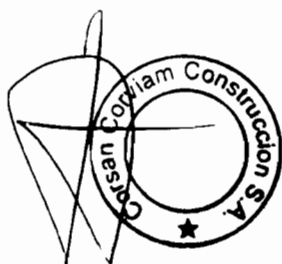
18.

Item of equipment: CONCRETE PUMPS – 02 NOS		
Equipment information	Name of manufacturer Pulitzmeister	Model and power rating MOLI 1407D
	Capacity 72/48 Cum/Hr.	Year of manufacture 2010
Current status	Current location Surat (India)	
	Details of current commitments Surat – Hazira Port Project.	
Source	Indicate source of the equipment <input checked="" type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	




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

Item of equipment: CONCRETE FIXED FORM PAVER – 01 NOS		
Equipment information	Name of manufacturer WRITGEN	Model and power rating MODEL SP-850 / 9.0M / 300HP
	Capacity Width – 9.0 Meters	Year of manufacture 2010
Current status	Current location Surat (India)	
	Details of current commitments Surat – Hazira Port Project.	
Source	Indicate source of the equipment <input checked="" type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	

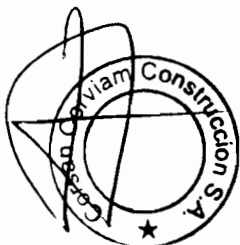


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Contractor

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

Man-Power Schedule as per requirement of Biding Document

No.	Position	Total Work Experience (years)	In Similar Works Experience (years)	Educational Qualification
1	Project Manager – 1 No	10	5	Degree in Civil Engg.
2	Highway Engineer – 1 No	5	3	Degree/ Diploma in Civil Engg.
3	Bridge Engineer – 1 No	5	3	Degree/ Diploma in Civil Engg.
4	Material Engineer – 1 No	5	3	Degree/ Diploma in Civil Engg.
5	Quantity Surveyor – 1 No	5	3	Degree/ Diploma in Civil Engg.
6	Equipment Maintenance Engineer – 1 No	5	3	Diploma in Mech. Engg.
7	Environment and Safety Manager – 1 No	3	1	Graduate with skill and experience in handling the Health, Environment, Safety issues



Form PER – 1: PROPOSED PERSONNEL

BY M/S CORSAN CORVIAM CONSTRUCCION S.A.

1.	Title of position* PROJECT MANAGER	Name – Mr. Sunil Pahalwan
2.	Title of position* HIGHWAY ENGINEER	Name –Mr. Vyas Narayan Dubey
3.	Title of position* BRIDGE ENGINEER	Name-Mr. Jesus Angel Labarra Blanco
4.	Title of position* MATERIAL ENGINEER	Name-Mr. Ruben Zamora Aguilera
5.	Title of position* QUANTITY SURVEYOR	Name-Mr. Jitendra Tamboli
6.	Title of position* EQUIPMENT MAINTENANCE ENGINEER	Name-Mr. Ashim Paul
7.	Title of position* ENVIRONMENT AND SAFETY MANAGER	Name-Mr. Ricardo Julio Paredes Barcena



## Resume of Proposed Personnel-1

Position-PROJECT MANAGER		
Personnel information	Name- Mr. Sunil Pahalwan	Date of birth-27.07.1961 Nationality : Indian
	Professional qualifications- Degree in Civil Engineering	
Present employment	Name of employer- M/S CORSAN CORVIAM CONSTRUCCION S.A	
	Address of employer – Caballero Andante 8, 28021, Madrid, Spain	
	Telephone: 0124-4823200	Contact (manager / personnel officer) Malaya Kumar Banerjee.
	Fax No:0124-4823210	E-mail:-mkbanerjee@isoluxcorsan.com
	Job title:-Project Manager	Years with present employer: 03 Years

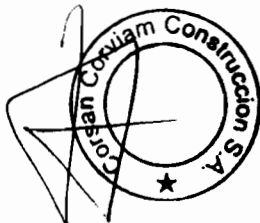
From	To	Company / Project / Position / Relevant technical and management experience
Dec' 10	Till Date	Corsan Corviam Construcccion S.A 4/6 Lanning of Gujrat Border – Surat – Hazira Port Section of NH-6 ( 130,79 Km)/Project Manager.
Dec' 07	Nov' 10	Valecha Engineering Ltd.. / 6 – lanning of existing 4- lanning 44.3 to 66.0 General Manager
April' 03	Dec' 07	DS Constructions Ltd. / 6 lanin of existing NH-8 from km (Delhi to Gurugaon) General Manager
July' 98	April' 03	M/s SOM DATT BUILDERS Ltd. / 4 lanning of existing 2 lane of NH-2 from Baunti k 470 to 38.(Total 51 km.)
April' 92	July' 98	M/s Birla GTM Enterprise Ltd. / 4 lanning of National Highway Km.162.50 to Km.231.00 / Sr. Manager
Dec' 88	April' 92	M/s SOM DATT BUILDERS Ltd. / Highway Project in Jordan. Length : 178 Km. / Sr. Engineer
Aug' 87	Dec' 88	M/s Continental Construction – Belfour Beatty (Joint Venture) / IFour lanning of National Highway No. 1 from to Km.130.00 / Dy. Manager
March' 85	Aug' 87	M/s Unitech Ltd., New Delhi / Thermal Powerhouse (Capacity 2x210 MW)at Kaperkhrda, Nagpur/Site Engineer



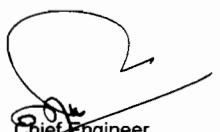
## Resume of Proposed Personnel-2

<b>Position- HIGHWAY ENGINEER</b>		
<b>Personnel information</b>	Name –Mr. VYAS NARAYAN DUBEY	Date of birth-15/10/63
	Professional qualifications:- Degree in Civil Engineering University of Cantabria	
<b>Present employment</b>	Name of employer- M/S CORSAN CORVIAM CONSTRUCCION S.A	
	Address of employer- Caballero Andante 8, 28021, Madrid, Spain.	
	Telephone: 0124-4823200	Contact (manager / personnel officer): Malaya Kumar Banerjee.
	Fax No:0124-4823210      E-mail:- mkbanerjee@isoluxcorsan.com	Job title:-Project Manager      Years with present employer:
	03 Years	

From	To	Company / Project / Position / Relevant technical and management experience
Nov-2009	Till Date	Corsan Corviam Construcccion S.A /6 Laning of KishaBeawar section with length of 44.14 km of NH-8 i te State of Rajasthan / Project Manager.
Nov-2005	Nov- 2009	KMC Constructions Ltd / widening of existing carriageway stretch of 61.149 Km Contract Package II (RJ-10) / Sr. Project Manager.
Nov-2001	Oct-2005	M S Associates Pvt. Ltd. Delhi / Widening of 4/6 lanes and of NH-6 from 17.600 Km to 72.000 km. (DANKUNI-KOLAGHAT) Project Manager
Mar-1998	Nov-2001	GSJ Envo Ltd. / Widening to 4/6 lanes and strengthening of NH-3 Project Manager
<u>Jan-1886</u>	Mar-1998	<i>H..J. Industries Ltd. (CK Birta group Co., Amlai (MP/civil to installation of 3 Nos. x 6.2 =18.6MW warstila make HFO base Power Plant / Engg. To Assist. Mamager Civil</i>



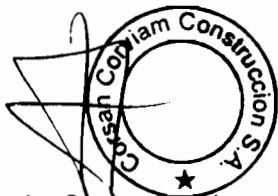
Corsan Corviam Construcccion S.A.  
Contractor

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

### Resume of Proposed Personnel-3

Position- : <b>BRIDGE ENGINEER</b>	
Personnel information	Name- MR. JESUS ANGEL LABARRA BLANCO      Date of birth-19/01/1973
	Professional qualifications- : Degree in Civil Engineering
Present employment	Name of employer- CORSAN CORVIAM CONSTRUCCION S.A
	Address of employer : Caballero Andante 8, 28021, Madrid, Spain
	Telephone: 0124-4823200      Contact (manager / personnel officer): Malaya Kumar Banerjee.
	Fax No:0124-4823210      E-mail:- mkbanerjee@isoluxcorsan.com
	Job title: Bridge / Structure Engineer      Years with present employer: 10 Years

From	To	Company / Project / Position / Relevant technical and management experience
Feb, 2002	Till Date	<p>Corsan Corviam Construcccion S.A – Extension of the Pasia Dock.(24.900.000Euro) Duration 26m,</p> <p>A-92 Motorway. Montilla-Aguilar de La Frontera Section (37.000.000E). Duration-29m.</p> <p>Cordoba-Malaga High Speed Line : Herrera-Rio Yeguas Section (49.000.000E). Duration 36m,</p> <p>Valecia High Speed Line. Enova-Pobla Llarga Section (36.800.000E). Duration 41m,</p> <p>Sant Boi-Llobregat High Speed Line (Barcelona). (241.000.000E). Duration 45m. Estimated Labour Force; 350</p> <p>East Dock Apron of Barajas Airport.(45.000.000E). Duration 13m</p> <p>Structure Engineer to Sr. Manager structure.</p>
May-1998	Feb'2001	<p>ACS Civil Works Projects department in central services/ HighSpeed R-3 Motorway, Extension of the Port of Almeria of the M-607/ Junior Structure Engineer</p>

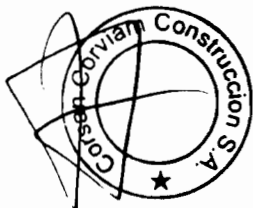




## Resume of Proposed Personnel-4

Position- : MATERIAL ENGINEER	
Personnel information	Name –Mr.Ruben Zomara Aguilera
	Date of birth:-01/11/1974 Nationality : Spanish
	Professional qualifications-Degree in Civil Engineering
Present employment	Name of employer- CORSAN CORVIAM CONSTRUCCION S.A
	Address of employer : Caballero Andante 8, 28021, Madrid, Spain
	Telephone: 0124-4823200
	Contact (manager / personnel officer): Malaya Kumar Banerjee.
	Fax No:0124-4823210
Job title: Sr. Material Manager	Years with present employer: 05 Years

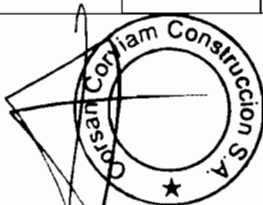
From	To	Company / Project / Position / Relevant technical and management experience
Jan-2008	Till date	Corsan Corviam Cobstruccion S.A – Varansi – Aurangabad se from Km. 786.000 to Km.987.400 iin the state of UP-Bihar Sr. Manager Materials.
June-2006	Dec'-2007	Groupo Isolux Corsan / MODIFIACATIO OF THE AGREEMENT FOR THE WORKS FOR THE CORDOBA-MALAGA EXPRESSWAY CORRIDOR PLAT FOR / HERRERA-LA RODA DE ANDALUCIA. Manager Materials
April-2000	May-2006	Corsan Corviam Cobstruccion S.A –/ MALAGA-NERJA MEDITERRANEAN MOTORWAY CN-340, FROM CADIZ TO BARCELONA VIA MALAGA./ Sr. Engineer Materials
Dec'-1998	April-2000	Material Engineer in LUBASA



## Resume of Proposed Personnel-5

Position- : QUANTITY SURVEYOR	
Personnel information	Name – Mr.JITENDRA TAMBOLI Date of birth:-19/05/1977 Nationality : Indian
	Professional qualifications -Degree in Civil Engineering, Construction Management.
Present employment	Name of employer- CORSAN CORVIAM CONSTRUCCION S.A
	Address of employer : Caballero Andante 8, 28021, Madrid, Spain
	Telephone: 0124-4823200 Contact (manager / personnel officer): Malaya Kumar Banerjee.
	Fax No:0124-4823210 E-mail:- mkbanerjee@isoluxcorsan.com
	Job title : Sr. Manager QS Years with present employer: 01 Years

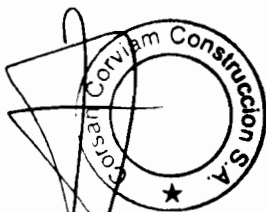
From	To	Company / Project / Position / Relevant technical and management experience
Jan'2010	Till date	Corsan Corviam Cobstruccion S.A – Beawar – Ajmer NH-8 Sr. Manager Materials.
		JMC Projects India Ltd., Posted at Head Office Mumbai Trichi-Madurai NH Project, TN-125 Kms, Badnawar-Thandla SH Project, MP-80 KM. Mandleswar-Pal SH Project, Karnataka(90Kms) Manager QS
		Oriental Strctural Engineers(p) limited, New Delhi. Angamali-Thodupuzha-Project Kerala,(45 Kms) Hungund – Pachgaon Project, Karnataka(90Kms) Manager QS
		Hindustan Constructions Company Limited, Mumbai. Kolaghat-Kharagpur Project, 64 Kms. West Bengal, Barhi – Gohar Project Jharkhand, Quantity Surveyor
		Contech reality Builders, Bhopal./ Multi Storied Residential Complex, Bhopal. Engineer



## Resume of Proposed Personnel-6

Position- : EQUIPMENT MAINTENANCE ENGINEER	
Personnel information	Name – Mr.Asim Paul
	Date of birth:-January 2, 1975 Nationality : Indian
	Professional qualifications -Degree in Mechanical Engineering,
Present employment	Name of employer- : CORSAN CORVIAM CONSTRUCCION S.A
	Address of employer : Caballero Andante 8, 28021, Madrid, Spain
	Telephone: 0124-4823200
	Contact (manager / personnel officer): Malaya Kumar Banerjee.
	Fax No:0124-4823210
	E-mail:- mkbanerjee@isoluxcorsan.com
	Job title : Manager (Plant & Equipment)
	Years with present employer: 02 Years

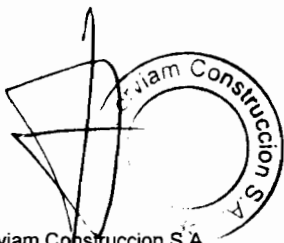
From	To	Company / Project / Position / Relevant technical and management experience
Jan' 2010	Till Date	Corsan Corviam Cobstruccion S.A – Varanasi – Aurangabad s 2 frm Km.786.000 to Km.987.4000 in the state of UP-Bihar / DGM Pant & machinary
April 2005	Jan'2010	JMC Projects (I) Ltd / Trichy – Madurai Road project NH-45B / Manager Plant & Equoipment
Dec'2002	April 2005	Hindustan ConstructionCo. Ltd. / NH-2, Grant Trunk Road Project Jharkhand Package -5B four Lane Concrete Road / Mechanical Engineer
May-2000	Nov-2002	Hindustan ConstructionCo. Ltd. / NH-2, Tala Hydro Electric Ptd. Package – C1 a 1020MW Dam Project / Mechanical Engineer
Feb-1998	May-2000	Hindustan ConstructionCo. Ltd. / Mumbai Pune Express way Package –B a Six Lane Concrete Road / Junior Mechanical Engineer

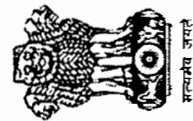


## Resume of Proposed Personnel-7

Position- : ENVIRONMENT & SAFETY ENGINER	
Personnel information	Name – Mr.RICARDO JULIO PAREDES BARCENA Date of birth:- 20.11. 1965 Nationality : Spanish
	Professional qualifications - : Degree in Civil Engineering
Present employment	Name of employer- : CORSAN CORVIAM CONSTRUCCION S.A
	Address of employer : Caballero Andante 8, 28021, Madrid, Spain
	Telephone: 0124-4823200 Contact (manager / personnel officer): Malaya Kumar Banerjee.
	Fax No:0124-4823210 E-mail:- mkbanerjee@isoluxcorsan.com
	Job title : Manager (Plant & Equipment) Years with present employer: 10 Years

From	To	Company / Project / Position / Relevant technical and management experience
Jan' 2001	Till Date	Corsan Corviam Cobstruccion S.A – Sr. Manager safety, Quality and Environment
May 1998	Jun'2000	Trabajos de Maquinaria Pesada, S.A. Manager Safety, and Environment
Dec'2002	April 2005	CONSTRUCCIONES SARRION, S.A. Works Manager
May-2000	Nov-2002	DRAGADOS Y CONSTRUCCIONES, S.A. Engineering Department Manager





**INDIA NON JUDICIAL**

Government of National Capital Territory of Delhi

**e-Stamp**

Certificate No. : IN-DL09686929258913L  
 Certificate Issued Date : 02-May-2013 10:28 AM  
 Account Reference : IMPACC (NY) 01741803-DEL-II-DL-DLH  
 Unique Doc. Reference : SUBIN-DL-DL11803-878304436972EL  
 Purchased By : Central Bank of India  
 Article 5 General Agreement : Not Applicable  
 Property Description : 0  
 Consideration Price (Rs.) : 0  
 (Zero)  
 First Party : Central Bank of India  
 Second Party : Not Applicable  
 Stamp Duty Paid By : Central Bank of India  
 Stamp Duty Amount (Rs.) : 100  
 (One Hundred only)



Please write or type below this line.....

पिन नं. 12 4060969/ -  
 दि. 24/05/2013  
 ए.आई.सी. (सिविल), दिल्ली

Statutory Audit  
 For details of the Stamp Duty, please refer to the website of the Government of India.

*(Signature)*  
 Chief Engineer,  
 World Bank Projects, Odisha  
 Employer  
 to the E.I.C.(Civil), Odisha  
 Bhubaneswar

**Performance Bank Guarantee**

पिन नं. 12 4060969/ -  
 दि. 24/05/2013  
 ए.आई.सी. (सिविल), दिल्ली

Central Bank of India, at Corporate Finance Branch, Parliament Street, New Delhi-110001  
 Beneficiary:- Chief Engineer, World Bank Projects, Odisha, Bhubaneswar. Address-O/o the E.I.C (Civil), Odisha, Nirman Soudha, Unit-V, Bhubaneswar-751001.

Date: 24/05/2013  
**PERFORMANCE GUARANTEE No.: 0346413840000509**

We have been informed that **Corsan Corviam Construction S.A.** (hereinafter called "the Contractor") has entered into Contract No. **PMU-WB-1772013-34471** dated 8<sup>th</sup> August, 2013 with you, for the execution of **Construction for Widening & Strengthening of existing carriageway to 2-lane for Chandali-Bhadrak-Anadpur Road (Km. 0000 to Km. 45/000 of SH-9 & Km 0/000 to Km. 43/000 of SH-53) (Balance Work)** (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, a performance guarantee is required.

At the request of the Contractor, we Central Bank of India, at Corporate Finance Branch, Parliament Street, New Delhi-110001, hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of **12,40,60,969/- (Rs. Twelve Crore Forty lakh Sixty Thousand Nine Hundred Sixty Nine Only)** such sum being payable in the types and proportions of currencies in which the Contract Price is payable, upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation(s) under the Contract, without your needing to prove or to show grounds for your demand or the sum specified therein.

This guarantee shall expire, no later than the 4<sup>th</sup> Day of December, 2016, and any demand for payment under it must be received by us at this office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No.458, except that subparagraph (ii) of Sub-article 20(a) are hereby excluded

Notwithstanding anything contained herein.

- a) Our liability under this Bank Guarantee shall not exceed Rs 12,40,60,969/- (Rs Twelve Crore Forty lakh Sixty Thousand Nine Hundred Sixty Nine Only).
- b) This Bank Guarantee shall be valid up to 04th Dec. 2016.
- c) We are liable to pay the guarantee amount or part thereof under this Bank Guarantee only & only if your serve upon us a written claim or demand on or before 04th Dec, 2016.

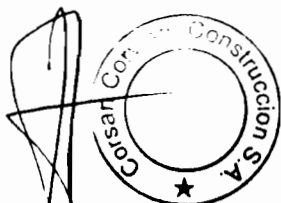
*(Signature)*  
 Chief Engineer,  
 World Bank Projects, Odisha  
 Employer  
 to the E.I.C.(Civil), Odisha  
 Bhubaneswar

Financial Resources			
S No.	Source of financing Indicating Name of Bank & Branch as Appropriate	Amount (INR)	Amount (US\$ Equivalent)
1	Networth as on 31.12.2011	7,312,530,460.00	134,917,536.16
1	BNP Paribas Sucursal Espana, Sited in C/Ribera del Loira, n28-28042-Madrid (Spain)	141,432,000.00	2,609,446.49
2	Banco Espirito Santo S.A.	9,900,240,000.00	182,661,254.61
<b>Total</b>		<b>17,354,202,460.00</b>	<b>320,188,237.27</b>

Exchange Rate considered : 1 US\$ = INR 54.200 as on 22nd April 2013  
 Exchange Rate considered : 1 Euro = INR 70.716 as on 22nd April 2013  
 (28 days before the bid Submission deadline)



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The undersigned Mr. Angel Navarro Escolar and Mr. Antonio Sáez Noriega, as holder of  
procuration of BNP PARIBAS SUCURSAL ESPAÑA, sited in C/ Ribera del Loira, nº  
28 28042 MADRID.

### HEREBY CERTIFY

That the firm **CORSAN CORVIAM CONSTRUCCION, S.A.**, with domicile in  
Madrid, C/ Caballero Andante, 8 is a subsidiary of GRUPO ISOLUX CORSAN S.A.,  
who is an old client of this Office where it is acknowledged as enjoying sufficient  
economic and financial solvency in connection with the commercial activity that it  
performs.

In addition, our experience in the development of the transactions made with said  
Company is excellent, the same as our experience with the payments made through this  
Office. There is no recorded in this Office of any default in payment of any acceptances  
domestic in said Company's account with us.

That we are currently granting in their favour credit facilities amounting approximately  
EUR 20.000.000.- This amount is all available today.

In witness whereof and at the request of the party in interest without this document  
having the nature of a bank guarantee but merely that of a business reference, we issue  
this certificate in Madrid on the 09<sup>th</sup> September of 2012.

BNP PARIBAS SUCURSAL ESPAÑA  
P.P.

Angel Navarro Escolar

Antonio Sáez Noriega



Corsan Corviam Construcción S.A.  
Contractor

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



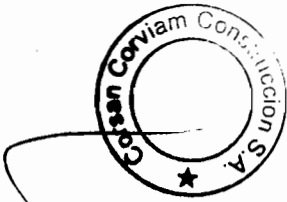
BANCO ESPIRITO SANTO, S.A. SUCURSAL EN ESPAÑA (SPAIN) AND ON ITS BEHALF, ENRIQUE RAMIREZ RODRIGUEZ, DULY AUTHORIZED,

CERTIFY

That the company CORSAN CORVIAM CONSTRUCCION, S.A. located in Madrid c/ Caballero Andante 8, Tax.Id. No. A79222709 is a client of this bank.

CORSAN CORVIAM CONSTRUCCION, S.A. is a company 100% participated by ISOLUX CORSAN, S.A /CORSAN CORVIAM CONSTRUCCION, S.A. is currently holding a Total risk amount of EUR +/- 140.000.000,00 in our Entity.

By request of the a.m. firm, we issue this certificate in Madrid, September 2012



Corsan Corviam Construccion S.A.  
Contractor

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



# Advance Payment Security

## Demand Guarantee

\_\_\_\_\_ [Bank's Name, and Address of Issuing Branch or Office]

**Beneficiary:** \_\_\_\_\_ [Name and Address of Employer]

**Date:** \_\_\_\_\_

**ADVANCE PAYMENT GUARANTEE No.:** \_\_\_\_\_

We have been informed that \_\_\_\_\_ [name of Contractor] (hereinafter called "the Contractor") has entered into Contract No. \_\_\_\_\_ [reference number of the contract] dated \_\_\_\_\_ with you, for the execution of \_\_\_\_\_ [name of contract and brief description of Works] (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, an advance payment in the sum \_\_\_\_\_ [amount in figures] (\_\_\_\_\_) [amount in words] is to be made against an advance payment guarantee.

At the request of the Contractor, we \_\_\_\_\_ [name of Bank] hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of \_\_\_\_\_ [amount in figures] (\_\_\_\_\_) [amount in words]<sup>1</sup> upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation under the Contract because the Contractor used the advance payment for purposes other than the costs of mobilization in respect of the Works.

It is a condition for any claim and payment under this guarantee to be made that the advance payment referred to above must have been received by the Contractor on its account number \_\_\_\_\_ at \_\_\_\_\_ [name and address of Bank].

The maximum amount of this guarantee shall be progressively reduced by the amount of the advance payment repaid by the Contractor as indicated in copies of interim statements or payment certificates which shall be presented to us. This guarantee shall expire, at the latest, upon our receipt of a copy of the interim payment certificate indicating that eighty (80) percent of the Contract Price has been certified for payment, or on the \_\_\_ day of \_\_\_, 2\_\_\_,<sup>2</sup>

<sup>1</sup> The Guarantor shall insert an amount representing the amount of the advance payment and denominated either in the currency(ies) of the advance payment as specified in the Contract, or in a freely convertible currency acceptable to the Employer.

<sup>2</sup> Insert the expected expiration date of the Time for Completion. The Employer should note that in the event of an extension of the time for completion of the Contract, the Employer would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee. In preparing this guarantee, the Employer might consider adding the following

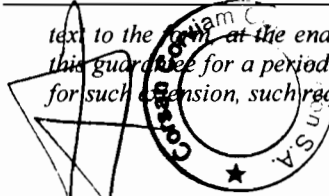
whichever is earlier. Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date..

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 458.

\_\_\_\_\_  
*[signature(s)]*

***Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.***

\_\_\_\_\_  
*text to the form at the end of the penultimate paragraph: "The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [six months][one year], in response to the Employer's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee."*



# Retention Money Security

## Demand Guarantee

\_\_\_\_\_ [Bank's Name, and Address of Issuing Branch or Office]

**Beneficiary:** \_\_\_\_\_ [Name and Address of Employer]

**Date:** \_\_\_\_\_

**RETENTION MONEY GUARANTEE No.:** \_\_\_\_\_

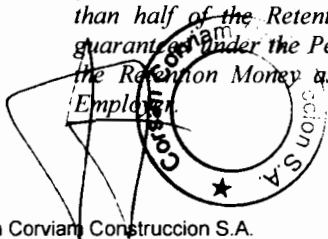
We have been informed that \_\_\_\_\_ [name of Contractor] (hereinafter called "the Contractor") has entered into Contract No. \_\_\_\_\_ [reference number of the contract] dated \_\_\_\_\_ with you, for the execution of \_\_\_\_\_ [name of contract and brief description of Works] (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, when the Taking-Over Certificate has been issued for the Works and the first half of the Retention Money has been certified for payment, payment of [insert the second half of the Retention Money or if the amount guaranteed under the Performance Guarantee when the Taking-Over Certificate is issued is less than half of the Retention Money, the difference between half of the Retention Money and the amount guaranteed under the Performance Security] is to be made against a Retention Money guarantee.

At the request of the Contractor, we \_\_\_\_\_ [name of Bank] hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of \_\_\_\_\_ [amount in figures] (\_\_\_\_\_ [amount in words]<sup>1</sup>) upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation under the Contract because the Contractor used the advance payment for purposes other than the costs of mobilization in respect of the Works.

It is a condition for any claim and payment under this guarantee to be made that the payment of the second half of the Retention Money referred to above must have been received by the Contractor on its account number \_\_\_\_\_ at \_\_\_\_\_ [name and address of Bank].

<sup>1</sup> The Guarantor shall insert an amount representing the amount of the second half of the Retention Money or if the amount guaranteed under the Performance Guarantee when the Taking-Over Certificate is issued is less than half of the Retention Money, the difference between half of the Retention Money and the amount guaranteed under the Performance Security and denominated either in the currency(ies) of the second half of the Retention Money as specified in the Contract, or in a freely convertible currency acceptable to the Employer.

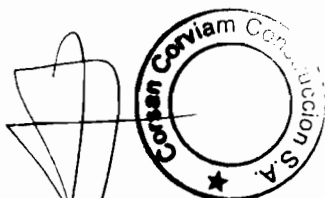


This guarantee shall expire, at the latest, 21 days after the date when the Employer has received a copy of the Performance Certificate issued by the Engineer. Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.


This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 458.

\_\_\_\_\_  
*[signature(s)]*

*Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.*



Corsan Corviam Construccion S.A.  
Contractor

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



GOVERNMENT OF ODISHA  
WORKS DEPARTMENT

CIVIL WORKS CONTRACT

**PACKAGE No. OSRP-Bal-P02**

*For*

Construction for Widening & Strengthening of Existing Carriageway  
to 2-Lane for Chandbali-Bhadrak-Anandpur Road  
(Km.0/000to Km.45/000 of SH-9 & Km.0/0 to Km.43/0 of SH-53)  
(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 CORSAN CORVIAM CONSTRUCCION S.A,**

India Office: 2nd Floor, Blok Two, Vatika Business Park,  
Sector-49, Sohna Road, Gurgaon-122001, Haryana (India)  
Tel. No.:(+91) 124 4823 200, Fax: (+91) 124 4823 210

**[VOLUME-II: CONTRACT DOCUMENTS]**

**Agreement Value: Rs. 248,12,19,385**

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

September 27, 2013



## CONTENTS of CONTRACT

<b>Volume – I</b>	:	Letter of Acceptance, Letter Bid and addenda
<b>Volume – II</b>	:	Particular Conditions and the General Conditions;
<b>Volume – III</b>	:	Specifications
<b>Volume – IV</b>	:	Drawings
<b>Volume – V</b>	:	Completed Schedules,

## CONTENTS of VOLUME II

Sl.	Description	Page No.
1	<b>PARTICULAR CONDITIONS</b>	1
	PART – A : Contract Data	2
	PART B : Specific Provisions	8
	Annexure – A1 : Salient features of some major Labour Laws applicable to establishments engaged in Construction of Civil works	15
	Annexure AII : Safety and Welfare Provisions for labour to be employed by the Contractor.	18
2	<b>GENERAL CONDITIONS</b>	24

  
  
Corviam Construccion S.A.  
Contractor

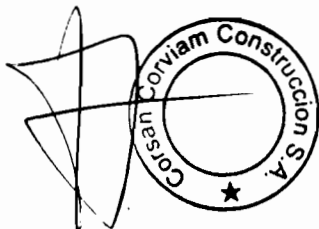
  
Chief Engineer  
World Bank Projects, Odisha  
Employer  
Chief Engineer  
World Bank Project  
O/o the E.I.C.(Civil), Odisha  
Bhubaneswar.





## Particular Conditions (PC)

The following Particular Conditions shall supplement the GC. Whenever there is a conflict, the provisions herein shall prevail over those in the GC.

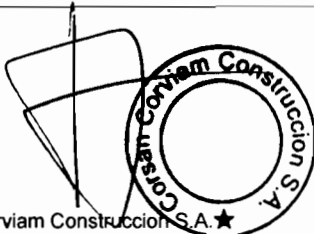


Corsan Corviam Construccion S.A.  
Contractor

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

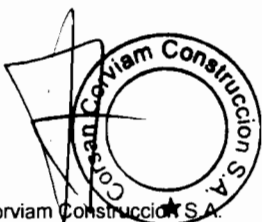
### Part A - Contract Data

Conditions	Sub-Clause	Data
Employer's name and address	1.1.2.2 & 1.3	Chief Engineer, World Bank Projects, Odisha, O/o the E.I.C(Civil), Odisha, Nirman Soudha, Unit-V Bhubaneswar – 751 001
Engineer's name and address	1.1.2.4 & 1.3	Resident Engineer M/s MSV International Inc. USA Bhagawati Bhawan, In front of Circuit House, Madhav Nagar, Bhadrak, Odisha, India
Bank's name	1.1.2.11	International Bank for Reconstruction and Development, ( The World Bank )
Borrower's name	1.1.2.12	Government of Odisha through Government of India
Time for Completion	1.1.3.3	<u>27 Months</u> <i>Refer to Table: Summary of Sections below</i>
Defects Notification Period	1.1.3.7	365 days.
Sections	1.1.5.6	<i>Refer to Table: Summary of Sections below</i>
Electronic transmission systems	1.3	Fax No- +91 674 239 0080 Email: pmuosrp@gmail.com
Governing Law	1.4	Law in force in the Union of India.
Ruling language	1.4	English
Language for communications	1.4	English
Time for the Parties entering into a Contract Agreement	1.6	28 days
Time for access to the Site	2.1	<u>Section-I</u> 33.5 kms in different stretches, will be handed over for execution prior to issuance of advance payments under Clause 14.2 as detailed below. Km. 1/000 to Km.11/000 & km13/000 to km 17/000 of SH 9 and

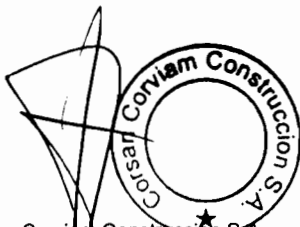


Conditions	Sub-Clause	Data
		<p>Km 4/000 to km11/000 , km12/000 to km 17/000 and km 21/000 to km 28/500 of SH 53</p> <p><u>Section-II</u> 32.5 Kms in a different stretches, will be handed over for execution within 3 months of date of commencement as detailed below.</p> <p>Km 18/000 to Km 45/000 of SH 9 and Km 32/500 to Km 38/000 of SH 53</p> <p><u>Section-III</u> Balance 22 km different stretches, will be handed over for execution within 6 months of date of commencement as detailed below.</p> <p>Km 0/000 to km 1/000, km 11/000 to km 13/000 &amp; km17/000 to 18/000 of SH-9 and</p> <p>Km 0/000 to 4/000, km 11/000 to km 12/000, km 17/000 to km 21/000, km 28/500 to km 32/500 and 38/000 to km 43/000 of SH 53</p> <p><b>Within two weeks of handing over of each stretch, the contractor needs to examine and provide acceptance of receiving encumbrance free land or inform the employer, with details of encumbrances if any.</b></p> <p><b>The Employer may reschedule the above Sections before the handing over time mentioned above considering the ground conditions. However, it shall be ensured to maintain the length of the Sections as far as possible.</b></p>
<b>Engineer's Duties and Authority</b>	3.1(b)(ii)	Variations resulting in an increase of the Accepted Contract Amount in excess of 2 % shall require approval of the Employer in aggregate subject to restrictions

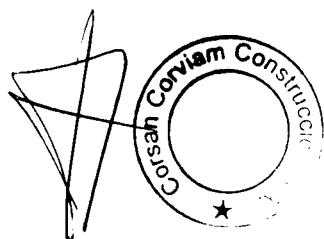
Conditions	Sub-Clause	Data
		imposed pursuant to Sub-Clause 3.1 of Particular Conditions
<b>Performance Security</b>	4.2	<p>The performance security will be in the form of an unconditional Bank Guarantee and in the same currency(ies). If the Bank Guarantee is issued by a financial institution located outside India, such financial institution shall have a correspondent financial institution located in India.</p> <p>The performance security shall be for an amount as stated below.</p> <p>(a) 5 percent of the Accepted Contract Amount</p> <p>(b) Additional performance security of 5% of the accepted contract amount in case the contractor is a Joint Venture and</p> <p>(c) additional security for unbalanced bids determined in accordance with the Cl.34.5 of ITB</p>
<b>Normal working hours</b>	6.5	08:00 Hours to 18:00 Hours Except otherwise stipulated by the Government of Odisha in exceptional climatic conditions.
<b>Commencement of Works</b>	8.1 (c)	Possessions of sites shall be given as mentioned in Sub-Clause 2.1 above.
<b>Delay damages for the Works</b>	8.7 & 14.15(b)	Refer to Table: Summary of Sections below
<b>Maximum amount of delay damages</b>	8.7	10 % of the final Contract Price.
<b>Provisional Sums</b>	13.5.(b)(ii)	NIL
<b>Adjustments for Changes in Cost</b>	13.8	Period "n" applicable to the adjustment multiplier "Pn": 3 months



Conditions	Sub-Clause	Data
<b>Total advance payment</b>	14.2	<u>5</u> % Percentage 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 mentioned in Sub-Clause 2.1 by the contractor.  The Bank Guarantee shall be for the amount equivalent to the advance given to the contractor and shall not be an interest bearing advance.
<b>Repayment amortization rate of advance payment</b>	14.2(b)	10 % Repayment will begin when amount of work certified by the Engineer attains 30% of the Contract Price
<b>Percentage of Retention</b>	14.3	10 %
<b>Limit of Retention Money</b>	14.3	5 % of the Accepted Contract Amount
<b>Plant and Materials</b>	14.5(b)(i)	Not Applicable
	14.5(c)(i)	Not Applicable
	14.5(c)(ii)	On the following materials, subject to maximum of 2% of the accepted contract amount against Bank Guarantee of equal value, at any point of time, as required for utilization in the permanent works subject to maximum of 35% of the contract amount.  1. Reinforced Steel 2. Processed Aggregates complying with the relevant specifications.
<b>Minimum Amount of Interim Payment Certificates</b>	14.6	(i) 1 % of the Accepted Contract Amount till 10% of contract amount is achieved. (ii) 3 % of the Accepted Contract Amount between 10.01% to 85% of contract amount. (ii) 5% of the Accepted Contract Amount beyond 85.01% of contract amount.



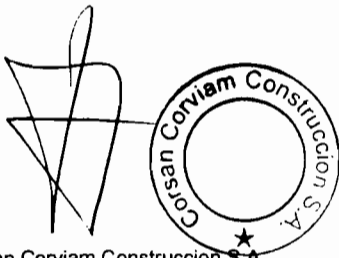
Conditions	Sub-Clause	Data
<b>Publishing source of commercial interest rates for financial charges in case of delayed payment</b>	14.8	These financing charges shall be calculated at 1% over the PLR rate fixed by Reserve Bank of India to Commercial Banks for payment in local currencies (INR) and at 2% over the 3 month's London Inter Bank Offer Rate (LIBOR) for foreign currencies.
<b>Maximum total liability of the Contractor to the Employer</b>	17.6	The accepted contract amount
<b>Periods for submission of insurance:</b> a. evidence of insurance. b. relevant policies	18.1	14 days 28 days
<b>Maximum amount of deductibles for insurance of the Employer's risks</b>	18.2(d)	<i>US\$ 5000 or Rs. 250,000 per occurrence</i>
<b>Minimum amount of third party insurance</b>	18.3	<i>Rs. 10,000,000 per occurrence with unlimited number of occurrences</i>
<b>Date by which the DB shall be appointed</b>	20.2	30 days after the Commencement date
<b>The DB shall be comprised of</b>	20.2	Three Members from IRC panel
<b>List of potential DB sole members</b>	20.2	<i>None</i>
<b>Appointment (if not agreed) to be made by</b>	20.3	<i>Secretary General of Indian Roads Congress.</i>
<b>Rules of arbitration</b>	20.6(a)	<i>Rules and Procedures laid out for Arbitration &amp; Reconciliation Act, 1996 of Government of India or any amendment thereof.</i>



**Table: Summary of Sections**

The following table shows the time for completion and delay damages for different sections. In case the Contractor delays in any of the sections but completes the total work within total completion period then the liquidated damages deducted for delay in a particular section shall be refunded back to the Contractor.

<b>Section Name/Description (Sub-Clause 1.1.5.6)</b>	<b>Time for Completion (Sub-Clause 1.1.3.3)</b>	<b>Damages for Delay (Sub-Clause 8.7)</b>
Section-I: 33.5 kms as mentioned in Cl. 2.1	14 (Fourteen) Months from Commencement of Works	<u>INR. 303,000 per day</u>
Section-II: 32.5 Kms	21 (Twenty one) Months from Commencement of Works	<u>INR. 587,000 per day</u>
Section-III: Balance length of 22.0 Kms	27 (Twenty-seven) Months from Commencement of Works	<u>INR. 397,000 per day</u>

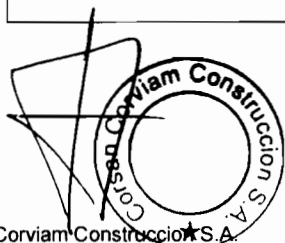


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Contractor

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

## Part B - Specific Provisions

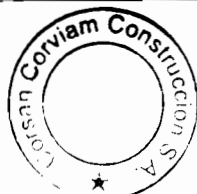
<p><b>Clause 1.5</b> <b>Priority of Documents</b></p>	<p>Delete sub paragraphs (a) to (i) in Sub-Clause 1.5 and substitute with the following:</p> <ul style="list-style-type: none"> <li>a. the Contract Agreement (if any),</li> <li>b. the Letter of Acceptance,</li> <li>c. the record of pre-award clarifications ( if any),</li> <li>d. the letter of Tender alongwith addenda,</li> <li>e. the Particular Conditions- Part-A-Contract Data</li> <li>f. the Particular Conditions-Part-B-Specific Provisions,</li> <li>g. the General Conditions</li> <li>h. Works Requirement             <ul style="list-style-type: none"> <li>(a) Part-I General Specifications</li> <li>(b) Part-II-Supplimentary Technical Specifications including additional Technical Specifications.</li> <li>(c) Part-III-Technical Specifications for Building Work                 <ul style="list-style-type: none"> <li>i. the Drawings</li> </ul> </li> </ul> </li> <li>(j) the Priced Bill of Quantities</li> <li>(k) the Environment Management Plan (EMP) and</li> <li>(l) any other documents forming part of the Contract</li> </ul>
<p><b>Sub-Clause 4.1</b> <b>Contractor's</b> <b>General</b> <b>Obligations</b></p>	<p>Add the following at the end of 5<sup>th</sup> Paragraph.</p> <p>Working Drawings / fabrication drawings for temporary works (such as form work, staging, centering, scaffolding, specialized construction, handling and launching facilities and the like), material list for structural fabrication as well as detailed drawings for anchorage and temporary support details for pre-stressing cables as well as bar bending and cutting schedules for reinforcement etc. shall be prepared by the Contractor at his own cost and forwarded in triplicate to the Engineer at least four weeks in advance of actual constructional requirements. The Engineer will scrutinize and return one copy of the same for the Contractor's use with amendments, if any, noted in red ink within two weeks of submission. Such approval shall not relieve the Contractor of any of his responsibilities in connection with temporary works. The Contractor will supply six copies of the approved drawings for the Engineer's use. The cost of preparing all such items of work shall be deemed to have been included in the respective rates/prices quoted by the Contractor in the Bill of Quantities.</p> <p>The Contractor shall ensure that his representative or Senior Site Representative attends all the periodic review meetings notified by the Engineer / Employer / Employer's representative.</p>





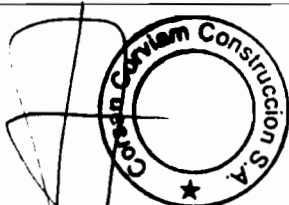
	<p><u>Maintenance of Road</u></p> <p>As regards to maintenance of road, the contractor's obligations shall be limited to the portions/ stretches/ structures handed over to him by the Employer. Other stretches not handed over to him shall be maintained by the Employer till handing over.</p>
<b>Clause 4.2 Performance Security</b>	Substitute the words ' an entity and from within a country(or other jurisdiction)' starting in the 4th line of 2nd paragraph of Sub-Clause 4.2 with 'any Nationalized/ Scheduled Commercial Bank located in India or a Foreign Bank with counter guarantee from a Nationalized/ Scheduled Commercial Bank located in India'
<b>Clause 4.4 Sub-Contractors</b>	Replace the words 'the whole of Works' with 'more than 30% of the Works in terms of value including the Work subcontracted to
<b>Clause 4.7 Setting Out</b>	Add the following paragraph after 1st paragraph of sub-Clause "The Contractor shall give to the Engineer not less than 48 (forty eight) hours notice of his intention to set out or give levels for any part of the Works so that timely arrangement may be made for checking or issuing instructions."
<b>Clause 4.14 Avoidance of Interference</b>	Add the following paras (c), (d) and (e) after para (b) as follows: (c) "In case, any operation connected with traffic necessitated diversion, obstruction or closure of any road, railway or any other Right of Way, the approval of the Engineer or the Engineer's Representative and the concerned authorities shall be obtained well in advance by the Contractor." (d) The Contractor shall so conduct his operations as to have under construction no greater length or amount of work than he can carry out efficiently with due regard to the convenience of the public. (e) The Contractor shall maintain the existing road in its normal condition suitable for the season of the year, from the time he commences the work on Site until the completion of the works.
<b>Sub-Clause 6.4 Staff and Labour</b>	Add the following at end of Sub-Clause 6.4: The employees of the Contractor and the Sub-contractor shall in no case 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 Construction of Civil Works are given in Annexure A-1 for reference purpose.  The contractor and sub contractor shall comply with the safety and welfare provisions as detailed in Annexure A-II

<b>Sub-Clause 7.3 Inspection</b>	Amend the first line of last para as follows: The Contractor shall give <b>“not less than 48 (forty eight) hours”</b> notice to the Engineer whenever any...
<b>Clause 8.3 Programme</b>	Insert the words ‘for his consent in five hard copies and 2 versions on compact discs’ after ‘Engineer’ in the 1st sentence of Sub-Clause 8.3. Delete sub paragraph (a) of Sub Clause 8.3 and replace with the following: (a) the order in which the Contractor intends to carry out the works including; (i) A detailed works programme indicating the anticipated timing of each stage of construction. The work programme shall be prepared using MS Project or Primavera Project Management software.  (ii) A detailed mobilization programme with all principal mobilization events including the anticipated timing of procurement, delivery to site, construction, erection and commissioning, provision of facilities for the Employer’s and Engineer’s personnel, mobilization of key personnel, etc. This programme will provide the basis for the stage release of advance payments as prescribed under Clause 14.2.
<b>Clause 10.1 Taking Over of Works and Sections</b>	Add the following additional paragraph after second paragraph of Sub-Clause 10.1: ‘Before the Works are taken over in accordance with this Clause 10, the Contractor shall supply all drawings as appropriate of the Work as-built. Unless otherwise agreed, the Work shall not be considered to be completed for the purpose of Taking Over until such drawings have been approved by the Engineer and submitted to the Employer.’
<b>Clause 12.3 Evaluation</b>	Replace ‘0.25%’ with ‘1%’ in sub-para (a) (ii) of Sub-Clause 12.3. Delete sub-para (a) (iii) of sub-Clause 12.3 and renumber the sub-para (a) (iv) as (a) (iii) Add the following after sub-para (a) (iii): The new rate fixed by the Engineer shall be applicable only to the quantity exceeding the BOQ quantity. Provided further that no change in the rate for any item contained in the BOQ shall be considered in case of any decrease in the actual quantity of work executed.
<b>Sub-Clause 14.1 The Contract Price</b>	<i>Add</i> (a) Notwithstanding the provisions of subparagraph (b), Contractor's Equipment, including essential spare parts

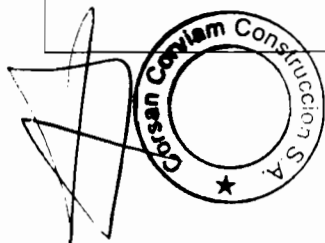


	<p>therefore, imported by the Contractor for the sole purpose of executing the Contract shall be temporarily exempt from the payment of import duties and taxes upon initial importation, provided the Contractor shall post with the customs authorities at the port of entry an approved export bond or bank guarantee, valid until the Time for Completion plus six months, in an amount equal to the full import duties and taxes which would be payable on the assessed imported value of such Contractor's Equipment and spare parts, and callable in the event the Contractor's Equipment is not exported from the Country on completion of the Contract. A copy of the bond or bank guarantee endorsed by the customs authorities shall be provided by the Contractor to the Employer upon the importation of individual items of Contractor's Equipment and spare parts. Upon export of individual items of Contractor's Equipment or spare parts, or upon the completion of the Contract, the Contractor shall prepare, for approval by the customs authorities, an assessment of the residual value of the Contractor's Equipment and spare part to be exported, based on the depreciation scale(s) and other criteria used by the customs authorities for such purposes under the provisions of the applicable Laws. Import duties and taxes shall be due and payable to the customs authorities by the Contractor on (a) the difference between the initial imported value and the residual value of the Contractor's Equipment and spare parts to be exported; and (b) on the initial imported value of Contractor's Equipment and spare parts remaining in the Country after completion of the Contract. Upon payment of such dues within 28 days of being invoiced, the bond or bank guarantee shall be reduced or released accordingly; otherwise the security shall be called in the full amount remaining.</p>
<p><b>Clause 14.13</b> Issue of Final Payment Certificate</p>	<p>Replace the word '28' with '42' in the 1st sentence of 1st paragraph of Sub-Clause 14.13 Replace the word '28' with '42' in the last paragraph of Sub-Clause 14.13</p>
<p><b>Clause 14.15</b> Currencies of Payment</p>	<p>Replace sub paragraph (e) of sub-Clause 14.15 with the following: 'if no rates of exchange are stated in the Schedule of Payment Currencies, they shall be those prevailing on the Base Date and shall be average buying and average selling rate of the foreign currency determined by the Reserve bank of India.</p>

<p><b>17.2 Contractor's Care of the Works</b></p>	<p>Add the following after end of para:</p> <p>(A) <u>Failure to Maintain the Road during construction</u></p> <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> <ol style="list-style-type: none"> <li>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.</li> <li>2. Shoulders : In case of failure to maintain the shoulders , a penalty shall be levied at the rate Rs.500/- per km per day.</li> </ol> <p>(B) <u>Failure to take up Road Safety measures during construction</u></p> <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>Deduction for non-performance</p> <ol style="list-style-type: none"> <li><b>1.Diversion:-</b> (a) Rs. 1,20,000/- per location plus Rs.1500/- per day per location towards maintenance from the date of installation till removal of the diversion (b) A penalty of Rs.5000/- per day per location shall be imposed from the date of occurrence till installation of the safety items.</li> <li><b>2.Part Road Barricading:-</b> (a) Rs. 75,000/- per location of 250 mtr. or less plus Rs.1500/- per day per location towards maintenance from the date of installation till completion of the stretch (b) A penalty of Rs.5000/- per day per location shall be imposed from the date of occurrence till installation of the safety items.</li> </ol>
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	<p>(C) <u>Failure to adhere to Environmental Mitigation Measures during construction</u></p> <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> <ol style="list-style-type: none"> <li>1. Not filling up of the post of Environment and Safety Officer- Penalty @ Rs. 50,000/- per month</li> <li>2. No proper sanitation &amp; waste disposal arrangements at the labour camp site- Penalty @ Rs. 10,000/- per single violation compounded to Rs. 50,000/- at any single instance</li> <li>3. No dust control measures at site- Penalty @ Rs. 5,000/- per location per single violation compounded to Rs. 50,000/- at any single instance</li> <li>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</li> <li>5. Improper disposal of debris/ residues- Penalty @ Rs. 10,000/- per single violation compounded to Rs. 50,000/- at any single instance</li> <li>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</li> <li>7. Persons not using Personal Protective Equipments (PPE)- Penalty @ Rs. 200/- per single violation per person</li> <li>8. Burrow area/ quarry management not done- Penalty @ Rs. 10,000/- per location per instance.</li> </ol>
<p><b>Clause 20.6 Arbitration</b></p>	<p>Substitute sub paragraph (a) with the following:</p> <p>(a) A dispute with an Indian Contractor shall be finally settled by arbitration in accordance with the Arbitration &amp; Conciliation Act, 1996, or any statutory amendment thereof. The arbitral tribunal shall consist of 3 (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 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 in the last, the Presiding arbitrator shall be appointed by the Appointing Authority as specified in the Bid Data Sheet. For the purposes of this Sub-Clause, the term</p>



	<p>“Indian Contractor” means a Contractor who is registered in India and is a juridical person created under Indian law as well as a joint venture between such a Contractor and a Foreign Contractor.</p> <p>In case of a dispute with a Foreign Contractor, the dispute shall be finally settled in accordance with the provisions of UNCITRAL Arbitration Rules. For the purposes of this Sub-Clause, the term “Foreign Contractor” means a Contractor who is not registered in India and is not a juridical person created under Indian Law.</p>
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Corsan Corviam Construcción S.A.  
Contractor

Handwritten signature and circular stamp of the Chief Engineer, World Bank Projects, Odisha. The stamp contains the text 'Chief Engineer, World Bank Projects, Odisha' around a central graphic.

Chief Engineer,  
World Bank Projects, Odisha  
Employer  
Via the E.I.C.(Civil), Odisha  
Bhubaneswar

**Annexure-AI****Salient features of some major Labour Laws applicable to establishments engaged in Construction of Civil Works****(i) Workmen Compensation Act, 1923**

The Act provides for compensation in case of injury by accident arising out of and during the course of employment.

**(ii) 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 at the rate of 15 days wages for every completed year of service. The Act is applicable to all establishments employing 10 or more employees.

**(iii) Employees' PF and Miscellaneous Provisions Act, 1952**

The Act provides for monthly contributions by the employer plus workers @10 % or 8.33 %. The benefits payable under the Act are:

- (a) Pension or family pension on retirement or death as the case may be.
- (b) Deposit linked insurance on the death in harness of the worker.
- (c) Payment of PF accumulation on retirement/death etc.

**(iv) Maternity Benefit Act, 1951**

The Act provides for leave and some other benefits to women employees in case of confinement or miscarriage etc.

**(v) Contract Labour (Regulation and Abolition) Act, 1970**

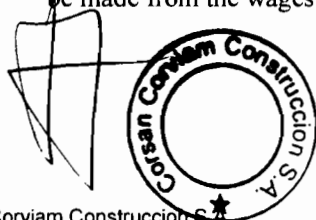
The Act provides for certain welfare measures to be provided by the Contractor to contract labour and in case the Contractor fails to provide, the same are required to be provided by the Principal Employer by Law. The principal employer is required to take Certificate of Registration and the Contractor is required to take a 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.

**(vi) 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, and Runways are scheduled employment.

**(vii) 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.



**(viii) Equal Remuneration Act, 1979**

The Act provides for payment of equal wages for work of equal nature to Male and Female workers and not for making discrimination against Female employees in the matters of transfers, training and promotions etc.

**(ix) Payment of Bonus Act, 1965**

The Act is applicable to all establishments employing 20 or more workmen. 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. 3,500/- per month or less. The bonus to be paid to employees getting Rs. 2,500/- per month or above up to Rs.3, 500/- per month shall be worked out by taking wages as Rs.2, 500/- 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 the Act.

**(x) 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.

**(xi) 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.

**(xii) Trade Unions Act, 1926**

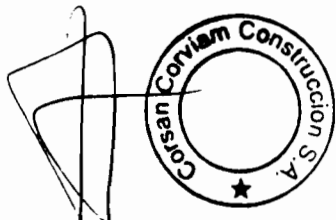
The Act lays down the procedure for registration of trade unions of workmen and employees. The trade unions registered under the Act have been given certain immunities from civil and criminal liabilities.

**(xiii) Child Labour (Prohibition and 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.

**(xiv) Inter-State Migrant Workmen's (Regulation of Employment and 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



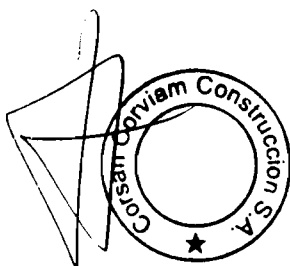


**(xv) The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 and The Building and Other Construction workers Welfare Cess Act of 1996**


All the establishments who carry on any building or other construction work and employ 10 or more workers are covered under this Act. All such establishments are required to pay Cess @ 1% of the cost of construction as notified by the Labour and Employment Department, Government of Odisha vide Resolution dated December 15, 2008. The employer of the establishment is required to provide safety measures at the Building or Construction work and other welfare measures, such as Canteens, First-aid facilities, Ambulance, Housing accommodation for Workers near the workplace etc. The employer to whom the Act applies has to obtain a registration certificate from the Registering Officer appointed by the Government.

**(xvi) The Factories Act, 1948**

The Act lays down the procedure for approval of 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.



Corsan Corviam Construcccion S.A.  
Contractor

  
Chief Engineer,  
World Bank Projects, Odisha  
World Bank Project Employer  
E.I.C.(Civil), Odisha  
Bhubaneswar

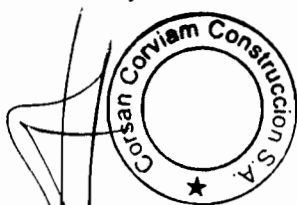
**Annexure-A II****Safety & Welfare Provisions for labour to be employed by the Contractor**

All necessary personal safety equipment as considered adequate by the Engineer shall be available for use of persons employed on the Site and maintained in a condition suitable for immediate use; and the Contractor shall take adequate steps to ensure proper use of such equipment by those concerned.

**1. Safety Provisions:**

The Contractor shall comply with all the precautions as required for the safety of the workmen.

- (i) All workmen at site shall be provided with safety helmets and yellow/orange jackets. Workmen required on site during night hours shall be provided with fluorescent yellow jackets with reflective lopes.
- (ii) Workers employed on mixing asphaltic materials, cement, lime mortars, concrete etc. shall be provided with protective footwear, protective goggles.
- (iii) Those engaged in handling any material, which is injurious to the eyes, shall be provided with protective goggles.
- (iv) Those engaged in welding works shall be provided with welder's protective eye-shield.
- (v) Stone breakers shall be provided with protective goggles and protective clothing and seated at sufficiently safe intervals.
- (vi) Suitable scaffolds shall be provided for workmen for all work that cannot safely be done from the ground, or from solid construction except for such short period work as can be done safely from ladders. When a ladder is used, an extra labourer shall be engaged for holding the ladder and if the ladder is used for carrying materials as well, suitable foot-holds and hand-holds shall be provided on the ladder, which shall be given an inclination not steeper than 1/4 to 1.
- (vii) Scaffolding or staging more than 3.25 metres above the ground or floor, swung or suspended from an overhead support or erected with stationary support, shall have a guard rail properly attached, bolted, braced and otherwise secured at least 1 metre high above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends thereof with only such openings as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the support or structure.
- (viii) Working platforms, gangways, and stairways shall be so constructed that they do not sag unduly or unequally, and if the height of any platform or gangway or stairway is more than 3.25 metres above ground level or floor level, it shall have closely spaced boards, have adequate width and be suitably provided with guard rails as described in (ii) above.
- (ix) Every opening in the floor of a structure or in a working platform shall be provided with suitable means to prevent fall of persons or materials by providing suitable fencing or railing with a minimum height of one metre.
- (x) Safe means of access and egress shall be provided to all working platforms and other working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9 metres in



length. The width between side rails in a rung ladder shall in no case be less than 30 cm for ladders up to and including 3 metres in length. For longer ladders the width shall be increased at least 6 mm for each additional 30 cm of length. Spacing of steps shall be uniform and shall not exceed 30 cm.

(xi) Adequate precautions shall be taken to prevent danger from electrical equipment. No materials on any of the sites shall be so stacked or placed as to cause danger or inconvenience to any person or the public. The Contractor shall provide all necessary fencing and lights to protect the public from accidents and shall be bound to bear the expenses of defending every suit, action or other proceedings at law that may be brought by any person for injury sustained owing to neglect of the above precautions and to pay any damages and costs which may be awarded in any such suit, action or proceedings to any such person or which may with the consent of the Contractor be paid to compromise any claim by any such person.

(xii) Excavation and Trenching: All trenches, 1.5 metres or more in depth, shall at all times be supplied with at least one ladder for each 20 metres in length or fraction thereof. Ladders shall be extended from the bottom of the trench to at least 1 metre above the surface of the ground. The sides of a trench, which is 1.5 metres or more in depth shall be stepped back to provide a suitable slope, or be securely held by timber bracing so as to avoid the danger of side collapse. Excavated material shall not be placed within 1.5 metres of the edge of any trench or half the depth of the trench, whichever is more. Excavation shall be made from the top to the bottom. Under no circumstances shall undermining or undercutting be done.

(xiii) When workers are employed in sewers and manholes, which are in use, the Contractor shall ensure that manhole covers are open and manholes are ventilated at least for an hour before workers are allowed to go into them. Manholes so open shall be cordoned off with suitable railing and provide warning signals or boards to prevent accidents to the public.

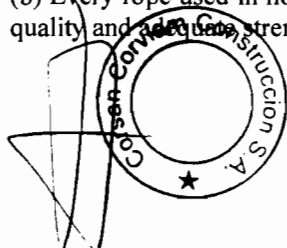
(xiv) Demolition: Before any demolition work is commenced and also during the process of the work:

- a) All roads and open areas adjacent to the work site shall either be closed or suitably protected.
- b) No electric cable or apparatus, which is liable to be a source of danger other than a cable or apparatus used by operators, shall remain electrically charged:
- c) All practical steps shall be taken to prevent danger to persons employed by the Employer, from risk of fire or explosion, or flooding. No floor, roof or other part of a building shall be so overloaded with debris or materials as to render it unsafe.

(xv) When work is performed near any place where there is risk of drowning all necessary equipment shall be provided and kept ready for use and all necessary steps taken for prompt first aid treatment of all injuries likely to be sustained during the course of the work.

(xvi) Use of hoisting machines and tackle including their attachments, anchorage and supports shall conform to the following:

- (a) These shall be of good mechanical construction, sound material and adequate strength and free from patent defects and shall be kept in good working order be regularly inspected and properly maintained.
- (b) Every rope used in hoisting or lowering materials or as a means of suspension shall be of durable quality and adequate strength, and free from defects.



(c) For every hoisting machine and every chain hook, shackle, swivel and pulley block used in hoisting, lowering or as means of suspension, safe working load shall be ascertained by adequate means. Every hoisting machine and all gear referred to above shall be plainly marked with safe working load. In case of a hoisting machine or a variable safe working load, each safe working load and conditions under which it is applicable shall be clearly indicated. No part of any machine or any gear referred to in the paragraph above shall be loaded beyond safe working load except for the purpose of testing

(xvii) Motors, gearing, transmission, electric wiring and other dangerous parts of hoisting appliances shall be provided with efficient safeguards; hoisting appliances shall be provided with such means as will reduce the risk of accident during descent of load to the minimum. Adequate precautions shall be taken to reduce to the minimum risk of any part of a suspended load becoming accidentally displaced. When workers are employed on electrical installations which are already energised, insulating mats, working apparel such as gloves, sleeves and boots, as may be necessary, shall be provided. Workers shall not wear any rings, watches and carry keys or other material which are good conductors of electricity.

(xviii) All scaffolds, ladders and other safety devices mentioned or described herein shall be maintained in a safe condition and no scaffold, ladder or equipment shall be altered or removed while it is in use. Adequate washing facilities shall be provided at or near places of work.

(xix) These safety provisions shall be brought to the notice of all concerned by displaying on a notice board at a prominent place at the work location. Persons responsible for ensuring compliance with the Safety Code shall be named therein by the Contractor.

(xx) To ensure effective enforcement of the rules and regulations relating to safety precautions, arrangements made by the Contractor shall be open to inspection by the Engineer or his Representative.

(xxi) Notwithstanding anything contained in condition (i) to (xv) above, the Contractor shall remain liable to comply with the provisions of all acts, rules, regulations and bylaws for the time being in force in India and applicable in this matter.

The Contractor shall be responsible for observance, by his sub-contractors, of the foregoing provisions.

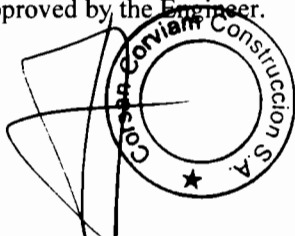
## 2. Labour Welfare Provisions:

### (i) First Aid:

At every workplace, there shall be maintained in a readily accessible place first aid appliances including an adequate supply of sterilised dressings and sterilised cotton wool as prescribed in the Factory Rules of the State in which the work is carried on. The appliances shall be kept in good order and, in large work places, they shall be placed under the charge of a responsible person who shall be readily available during working hours.

### (ii) Accommodation for Labour:

The Contractor shall during the progress of the work provide, erect and maintain necessary temporary living accommodation and ancillary facilities for labour at his own expense to standards and scales approved by the Engineer.



**(iii) Drinking Water:**

In every workplace, there shall be provided and maintained at suitable places easily accessible to labour, a sufficient supply of cold water fit for drinking.

Where drinking water is obtained from an intermittent public water supply each workplace shall be provided with storage tanks where drinking water shall be stored.

Every water supply storage shall be at a distance of not less than 15 metres from any latrine, drain or other source of pollution. Where water has to be drawn from an existing well, which is within such proximity of any latrine, drain or any other source of pollution, the well shall be properly chlorinated before water is drawn from it for drinking. All such wells shall be entirely closed in and be provided with a trap door, which shall be dust proof and waterproof.

A reliable pump shall be fitted to each covered well. The trap door shall be kept locked and opened only for cleaning or inspection, which shall be done at least once a month.

**(iv) Washing and Bathing Places:**

Adequate washing and bathing places shall be provided separately for men and women. Such places shall be kept in clean and drained condition.

**(v) Scale of Accommodation in Latrines and Urinals:**

There shall be provided within the precincts of every workplace, latrines and urinals in an accessible place, and the accommodation, separately for each for these, shall not be less than at the following scale:

No. of Seats

(a) Where number of persons does not exceed 50 2

(b) Where number of persons exceed 50 but does

not exceed 100 3

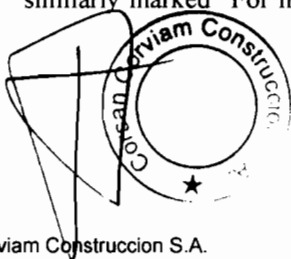
(c) For additional persons per 100 or part thereof 3

In particular cases, the Engineer shall have the power to increase the requirement, wherever necessary.

**(vi) Latrines and Urinals:**

Except in workplaces provided with water-flushed latrines connected with a water borne sewage system, all latrines shall be provided with dry-earth system (receptacles) which shall be cleaned at least four times daily and at least twice during working hours and kept in a strictly sanitary condition. Receptacles shall be tarred inside and outside at least once a year.

If women are employed, separate latrines and urinals, screened from those for men and marked in the vernacular in conspicuous letters "For women only", shall be provided. Those for men shall be similarly marked "For men only". A poster showing the figure of a man and a woman shall also be



exhibited at the entrance to latrines for each sex. There shall be adequate supply of water, close to latrines and urinals.

**(vii) Construction of Latrines:**

Inside walls shall be constructed of masonry or other non-absorbent material and shall be cement-washed inside and outside at least once a year. The dates of cement washing shall be noted in a register maintained for the purpose and kept available for inspection. Latrines shall have at least a thatched roof.

**(viii) Disposal of Excreta:**

Unless otherwise arranged for by the local sanitary authority, arrangement for proper disposal of excreta by incineration at the workplace shall be made by means of a suitable incinerator approved by the local medical health and municipal or cantonment authorities. Alternatively, excreta may be disposed of by putting a layer of night soils at the bottom of a pucca tank prepared for the purpose and covering it with a 15 cm layer of waste or refuse and then covering it with a layer of earth for a fortnight (when it will turn into manure).

The Contractor shall, at his own expense, carry out all instructions issued to him by the Engineer to effect proper disposal of soil and other conservancy work in respect of Contractor's work-purpose or employees on the site. The Contractor shall be responsible for payment of any charges, which may be levied by municipal or cantonment authority for execution of such work on his behalf.

**(ix) Provisions of shelters during rest:**

At every workplace, there shall be provided, free of cost, four suitable sheds, two for meals and two others for rest, separately for use of men and women labour. The height of each shelter shall not be less than 3 metres from floor level to lowest part of roof. Sheds shall be kept clean and the space provided shall be on the basis of at least 0.5 sq.m. per head.

**(x) Crèches:**

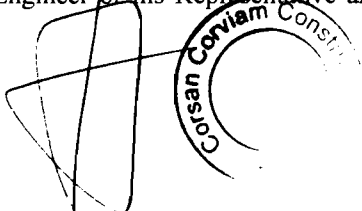
At a place where women are ordinarily employed, there shall be provided at least one hut for use of children under the age of 6 years belonging to such women. Huts shall not be constructed to a standard lower than that of thatched roof, mud floor and wall with wooden planks spread over mud floor and covered with matting.

Huts shall be provided with suitable and sufficient openings, for light and ventilation. There shall be adequate provision of sweepers to keep the places clean. There shall be a maidservant in attendance. Sanitary utensils shall be provided to the satisfaction of local medical, health a municipal or cantonment authorities. Use of huts shall be restricted to children, their attendants and mothers of children.

**(xi) Canteen:**

A cooked food canteen on a moderate scale shall be provided for the benefit of workers wherever it is considered necessary.

(xii) Planning, siting and erection of the above mentioned structures shall be approved by the Engineer or his Representative and the whole of such temporary accommodation shall at all times



during the progress of the Works be kept tidy and in a clean and sanitary condition to the satisfaction of the Engineer or his Representative and at the Contractor's expense. The Contractor shall conform generally to sanitary requirements of local medical, health and municipal or cantonment authorities and at all times adopt such precautions as may be necessary to prevent soil pollution of the Site.

On completion of the Works, the whole of such temporary structures shall be cleared away, all rubbish burnt, excreta or other disposal pits or trenches filled in and effectively sealed off and the whole of the site left clean and tidy, at the Contractor's expense, to the entire satisfaction of the Engineer.

**(xiii) Anti-malarial precautions:**

The Contractor shall, at his own expense, conform to all anti malarial instructions given to him by the Engineer, including filling up any borrow pits which may have been dug by him.

**(xiv) Awareness and Education of HIV/AIDS**

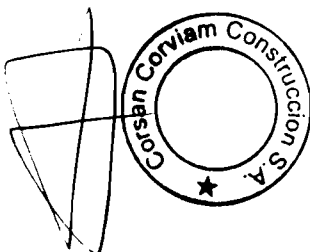
The contractor shall provide/carryout HIV/AIDS awareness and training programme to its labour and management, at least twice per year during the construction period.

**(xv) Child Labour Prohibition**

The contractor shall not employ Child Labour for any works or in any manner under the Contract at any time. In the event that the Contractor uses child labour, the Employer shall terminate the Contract.

**(xvi) Amendments:**

The Employer may, from time to time, add to, or amend these Rules and issue such directions as it may be considered necessary for the proper implementation of these Rules or for the purpose of removing any difficulty, which may arise in the administration thereof

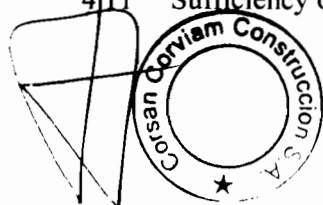




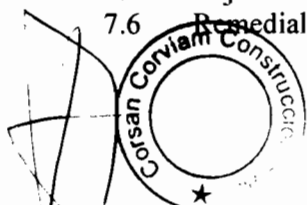


## General Conditions (GC)

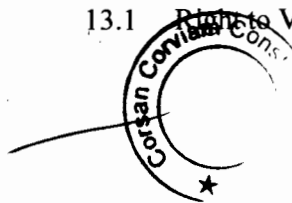
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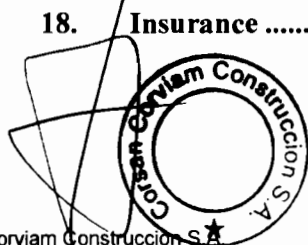
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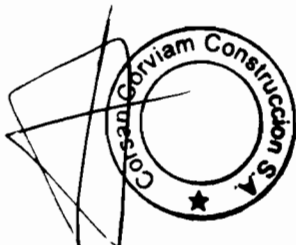
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## General Conditions (GC)

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

**CIVIL WORKS CONTRACT [ PACKAGE NO. OSRP-Bal-P02]**

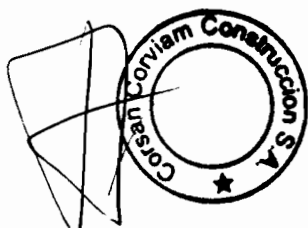
For

**Construction for Widening & Strengthening of existing carriageway to 2-lane  
for Chandbali-Bhadrak-Anadpur Road (Km. 0/000 to Km. 45/000 of SH – 9 &  
Km 0/000 to Km. 43/000 of SH – 53) (Balance Work)**

under

**Odisha State Roads Project**

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Corsan Corviam Construcción S.A.  
Contractor

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

## General Conditions

### 1. General Provisions

#### 1.1 Definitions

In the Conditions of Contract (“these Conditions”), which include Particular Conditions, Parts A and B, and these General Conditions, the following words and expressions shall have the meanings stated. Words indicating persons or parties include corporations and other legal entities, except where the context requires otherwise.

#### 1.1.1 The Contract

1.1.1.1 “Contract” means the Contract Agreement, the Letter of Acceptance, the Letter of Tender, these Conditions, the Specification, the Drawings, the Schedules, and the further documents (if any) which are listed in the Contract Agreement or in the Letter of Acceptance.

1.1.1.2 “Contract Agreement” means the contract agreement referred to in Sub-Clause 1.6 [Contract Agreement].

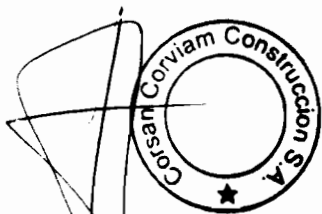
1.1.1.3 “Letter of Acceptance” means the letter of formal acceptance, signed by the Employer, of the Letter of Tender, including any annexed memoranda comprising agreements between and signed by both Parties. If there is no such letter of acceptance, the expression “Letter of Acceptance” means the Contract Agreement and the date of issuing or receiving the Letter of Acceptance means the date of signing the Contract Agreement.

1.1.1.4 “Letter of Tender” means the document entitled letter of tender or letter of bid, which was completed by the Contractor and includes the signed offer to the Employer for the Works.

1.1.1.5 “Specification” means the document entitled specification, as included in the Contract, and any additions and modifications to the specification in accordance with the Contract. Such document specifies the Works.

1.1.1.6 “Drawings” means the drawings of the Works, as included in the Contract, and any additional and modified drawings issued by (or on behalf of) the Employer in accordance with the Contract.

1.1.1.7 “Schedules” means the document(s) entitled schedules, completed by the Contractor and



submitted with the Letter of Tender, as included in the Contract. Such document may include the Bill of Quantities, data, lists, and schedules of rates and/or prices.

1.1.1.8 “Tender” means the Letter of Tender and all other documents which the Contractor submitted with the Letter of Tender, as included in the Contract.

1.1.1.9 “Bill of Quantities”, “Daywork Schedule” and “Schedule of Payment Currencies” mean the documents so named (if any) which are comprised in the Schedules.

1.1.1.10 “Contract Data” means the pages completed by the Employer entitled contract data which constitute Part A of the Particular Conditions.

## 1.1.2 Parties and Persons

1.1.2.1 “Party” means the Employer or the Contractor, as the context requires.

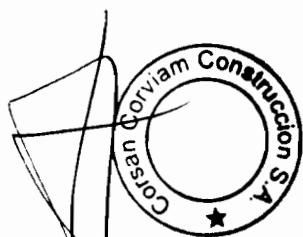
1.1.2.2 “Employer” means the person named as employer in the Contract Data and the legal successors in title to this person.

1.1.2.3 “Contractor” means the person(s) named as contractor in the Letter of Tender accepted by the Employer and the legal successors in title to this person(s).

1.1.2.4 “Engineer” means the person appointed by the Employer to act as the Engineer for the purposes of the Contract and named in the Contract Data, or other person appointed from time to time by the Employer and notified to the Contractor under Sub-Clause 3.4 [Replacement of the Engineer].

1.1.2.5 “Contractor’s Representative” means the person named by the Contractor in the Contract or appointed from time to time by the Contractor under Sub-Clause 4.3 [Contractor’s Representative], who acts on behalf of the Contractor.

1.1.2.6 “Employer’s Personnel” means the Engineer, the assistants referred to in Sub-Clause 3.2 [Delegation by the Engineer] and all other staff, labour and other employees of the Engineer and of the Employer; and any other personnel notified to the Contractor, by the





Employer or the Engineer, as Employer's Personnel.

1.1.2.7 "Contractor's Personnel" means the Contractor's Representative and all personnel whom the Contractor utilises on Site, who may include the staff, labour and other employees of the Contractor and of each Subcontractor; and any other personnel assisting the Contractor in the execution of the Works.

1.1.2.8 "Subcontractor" means any person named in the Contract as a subcontractor, or any person appointed as a subcontractor, for a part of the Works; and the legal successors in title to each of these persons.

1.1.2.9 "DB" means the person or three persons appointed under Sub-Clause 20.2 [Appointment of the Dispute Board] or Sub-Clause 20.3 [Failure to Agree on the Composition of the Dispute Board]

1.1.2.10 "FIDIC" means the Fédération Internationale des Ingénieurs-Conseils, the international federation of consulting engineers.

1.1.2.11 "Bank" means the financing institution (if any) named in the Contract Data.

1.1.2.12 "Borrower" means the person (if any) named as the borrower in the Contract Data.

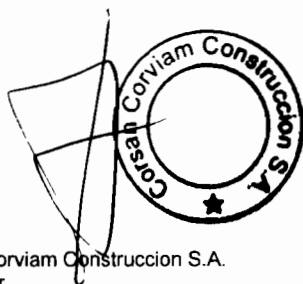
### 1.1.3 Dates, Tests, Periods and Completion

1.1.3.1 "Base Date" means the date 28 days prior to the latest date for submission of the Tender.

1.1.3.2 "Commencement Date" means the date notified under Sub-Clause 8.1 [Commencement of Works].

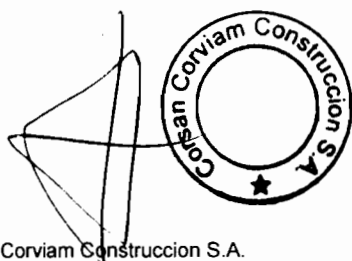
1.1.3.3 "Time for Completion" means the time for completing the Works or a Section (as the case may be) under Sub-Clause 8.2 [Time for Completion], as stated in the Contract Data (with any extension under Sub-Clause 8.4 [Extension of Time for Completion]), calculated from the Commencement Date.

1.1.3.4 "Tests on Completion" means the tests which are specified in the Contract or agreed by both Parties or instructed as a Variation, and which are carried out under Clause 9 [Tests on Completion] before the Works or a Section (as the case may be) are taken over by the Employer.



- 1.1.3.5 “Taking-Over Certificate” means a certificate issued under Clause 10 [Employer’s Taking Over].
- 1.1.3.6 “Tests after Completion” means the tests (if any) which are specified in the Contract and which are carried out in accordance with the Specification after the Works or a Section (as the case may be) are taken over by the Employer.
- 1.1.3.7 “Defects Notification Period” means the period for notifying defects in the Works or a Section (as the case may be) under Sub-Clause 11.1 [Completion of Outstanding Work and Remedying Defects], which extends over twelve months except if otherwise stated in the Contract Data (with any extension under Sub-Clause 11.3 [Extension of Defects Notification Period]), calculated from the date on which the Works or Section is completed as certified under Sub-Clause 10.1 [Taking Over of the Works and Sections].
- 1.1.3.8 “Performance Certificate” means the certificate issued under Sub-Clause 11.9 [Performance Certificate].
- 1.1.3.9 “day” means a calendar day and “year” means 365 days.
- 1.1.4.1 “Accepted Contract Amount” means the amount accepted in the Letter of Acceptance for the execution and completion of the Works and the remedying of any defects.
- 1.1.4.2 “Contract Price” means the price defined in Sub-Clause 14.1 [The Contract Price], and includes adjustments in accordance with the Contract.
- 1.1.4.3 “Cost” means all expenditure reasonably incurred (or to be incurred) by the Contractor, whether on or off the Site, including overhead and similar charges, but does not include profit.
- 1.1.4.4 “Final Payment Certificate” means the payment certificate issued under Sub-Clause 14.13 [Issue of Final Payment Certificate].
- 1.1.4.5 “Final Statement” means the statement defined in Sub-Clause 14.11 [Application for Final Payment Certificate].

#### 1.1.4 Money and Payments



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- 1.1.4.6 “Foreign Currency” means a currency in which part (or all) of the Contract Price is payable, but not the Local Currency.
- 1.1.4.7 “Interim Payment Certificate” means a payment certificate issued under Clause 14 [Contract Price and Payment], other than the Final Payment Certificate.
- 1.1.4.8 “Local Currency” means the currency of the Country.
- 1.1.4.9 “Payment Certificate” means a payment certificate issued under Clause 14 [Contract Price and Payment].
- 1.1.4.10 “Provisional Sum” means a sum (if any) which is specified in the Contract as a provisional sum, for the execution of any part of the Works or for the supply of Plant, Materials or services under Sub-Clause 13.5 [Provisional Sums].
- 1.1.4.11 “Retention Money” means the accumulated retention moneys which the Employer retains under Sub-Clause 14.3 [Application for Interim Payment Certificates] and pays under Sub-Clause 14.9 [Payment of Retention Money].
- 1.1.4.12 “Statement” means a statement submitted by the Contractor as part of an application, under Clause 14 [Contract Price and Payment], for a payment certificate.

### 1.1.5 Works and Goods

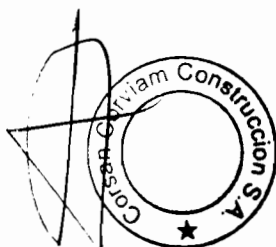
- 1.1.5.1 “Contractor’s Equipment” means all apparatus, machinery, vehicles and other things required for the execution and completion of the Works and the remedying of any defects. However, Contractor’s Equipment excludes Temporary Works, Employer’s Equipment (if any), Plant, Materials and any other things intended to form or forming part of the Permanent Works.
- 1.1.5.2 “Goods” means Contractor’s Equipment, Materials, Plant and Temporary Works, or any of them as appropriate.
- 1.1.5.3 “Materials” means things of all kinds (other than Plant) intended to form or forming part of the Permanent Works, including the supply-only materials (if any) to be supplied by the Contractor under the Contract.
- 1.1.5.4 “Permanent Works” means the permanent works to be

executed by the Contractor under the Contract.

- 1.1.5.5 “Plant” means the apparatus, machinery and other equipment intended to form or forming part of the Permanent Works, including vehicles purchased for the Employer and relating to the construction or operation of the Works.
- 1.1.5.6 “Section” means a part of the Works specified in the Contract Data as a Section (if any).
- 1.1.5.7 “Temporary Works” means all temporary works of every kind (other than Contractor’s Equipment) required on Site for the execution and completion of the Permanent Works and the remedying of any defects.
- 1.1.5.8 “Works” mean the Permanent Works and the Temporary Works, or either of them as appropriate.

#### 1.1.6 Other Definitions

- 1.1.6.1 “Contractor’s Documents” means the calculations, computer programs and other software, drawings, manuals, models and other documents of a technical nature (if any) supplied by the Contractor under the Contract.
- 1.1.6.2 “Country” means the country in which the Site (or most of it) is located, where the Permanent Works are to be executed.
- 1.1.6.3 “Employer’s Equipment” means the apparatus, machinery and vehicles (if any) made available by the Employer for the use of the Contractor in the execution of the Works, as stated in the Specification; but does not include Plant which has not been taken over by the Employer.
- 1.1.6.4 “Force Majeure” is defined in Clause 19 [Force Majeure].
- 1.1.6.5 “Laws” means all national (or state) legislation, statutes, ordinances and other laws, and regulations and by-laws of any legally constituted public authority.
- 1.1.6.6 “Performance Security” means the security (or securities, if any) under Sub-Clause 4.2 [Performance Security].
- 1.1.6.7 “Site” means the places where the Permanent Works are to be executed including storage and working



areas and to which Plant and Materials are to be delivered, and any other places as may be specified in the Contract as forming part of the Site.

1.1.6.8 “Unforeseeable” means not reasonably foreseeable by an experienced contractor by the Base Date.

1.1.6.9 “Variation” means any change to the Works, which is instructed or approved as a variation under Clause 13 [Variations and Adjustments].

## 1.2 Interpretation

In the Contract, except where the context requires otherwise:

- (a) words indicating one gender include all genders;
- (b) words indicating the singular also include the plural and words indicating the plural also include the singular;
- (c) provisions including the word “agree,” “agreed” or “agreement” require the agreement to be record in writing;
- (d) “written” or “in writing” means hand-written, type-written, printed or electronically made, and resulting in a permanent record; and
- (e) the word “tender” is synonymous with “bid”, and “tenderer” with “bidder” and the words “tender documents” with “bidding documents”

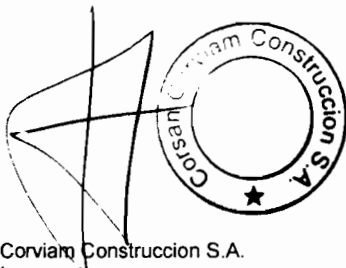
The marginal words and other headings shall not be taken into consideration in the interpretation of these Conditions.

In these Conditions, provisions including the expression "Cost plus profit" require this profit to be one-twentieth (5%) of this Cost unless otherwise indicated in the Contract Data.

## 1.3 Communications

Wherever these Conditions provide for the giving or issuing of approvals, certificates, consents, determinations, notices, requests and discharges, these communications shall be:

- (a) in writing and delivered by hand (against receipt), sent by mail or courier, or transmitted using any of the agreed systems of electronic transmission as stated in the Contract Data; and
- (b) delivered, sent or transmitted to the address for the recipient’s communications as stated in the Contract



Data. However:

- (i) if the recipient gives notice of another address, communications shall thereafter be delivered accordingly; and
- (ii) if the recipient has not stated otherwise when requesting an approval or consent, it may be sent to the address from which the request was issued.

Approvals, certificates, consents and determinations shall not be unreasonably withheld or delayed. When a certificate is issued to a Party, the certifier shall send a copy to the other Party. When a notice is issued to a Party, by the other Party or the Engineer, a copy shall be sent to the Engineer or the other Party, as the case may be.

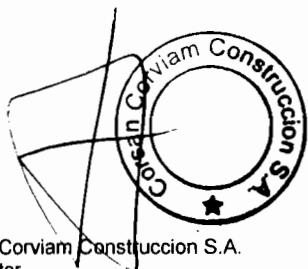
**1.4 Law and Language** The Contract shall be governed by the law of the country or other jurisdiction stated in the Contract Data.

The ruling language of the Contract shall be that stated in the Contract Data.


The language for communications shall be that stated in the Contract Data. If no language is stated there, the language for communications shall be the ruling language of the Contract.

**1.5 Priority of Documents** The documents forming the Contract are to be taken as mutually explanatory of one another. For the purposes of interpretation, the priority of the documents shall be in accordance with the following sequence:

- (a) the Contract Agreement (if any),
- (b) the Letter of Acceptance,
- (c) the Tender,
- (d) the Particular Conditions – Part A,
- (e) the Particular Conditions – Part B
- (f) these General Conditions
- (g) the Specification,
- (h) the Drawings, and
- (i) the Schedules and any other documents forming part of the Contract.



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Contractor

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

If an ambiguity or discrepancy is found in the documents, the Engineer shall issue any necessary clarification or instruction.

#### 1.6 Contract Agreement

The Parties shall enter into a Contract Agreement within 28 days after the Contractor receives the Letter of Acceptance, unless the Particular Conditions establish otherwise. The Contract Agreement shall be based upon the form annexed to the Particular Conditions. The costs of stamp duties and similar charges (if any) imposed by law in connection with entry into the Contract Agreement shall be borne by the Employer.

#### 1.7 Assignment

Neither Party shall assign the whole or any part of the Contract or any benefit or interest in or under the Contract. However, either Party:

- (a) may assign the whole or any part with the prior agreement of the other Party, at the sole discretion of such other Party, and
- (b) may, as security in favour of a bank or financial institution, assign its right to any moneys due, or to become due, under the Contract.

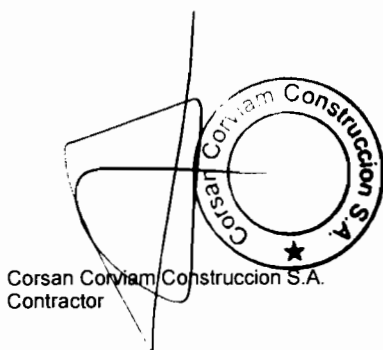
#### 1.8 Care and Supply of Documents

The Specification and Drawings shall be in the custody and care of the Employer. Unless otherwise stated in the Contract, two copies of the Contract and of each subsequent Drawing shall be supplied to the Contractor, who may make or request further copies at the cost of the Contractor.

Each of the Contractor's Documents shall be in the custody and care of the Contractor, unless and until taken over by the Employer. Unless otherwise stated in the Contract, the Contractor shall supply to the Engineer six copies of each of the Contractor's Documents.

The Contractor shall keep, on the Site, a copy of the Contract, publications named in the Specification, the Contractor's Documents (if any), the Drawings and Variations and other communications given under the Contract. The Employer's Personnel shall have the right of access to all these documents at all reasonable times.

If a Party becomes aware of an error or defect in a document which was prepared for use in executing the Works, the Party shall promptly give notice to the other Party of such error or defect.



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Employer  
World Bank Project  
Via the E.I.C.(Civil), Odisha  
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### 1.9 Delayed Drawings or Instructions

The Contractor shall give notice to the Engineer whenever the Works are likely to be delayed or disrupted if any necessary drawing or instruction is not issued to the Contractor within a particular time, which shall be reasonable. The notice shall include details of the necessary drawing or instruction, details of why and by when it should be issued, and the nature and amount of the delay or disruption likely to be suffered if it is late.

If the Contractor suffers delay and/or incurs Cost as a result of a failure of the Engineer to issue the notified drawing or instruction within a time which is reasonable and is specified in the notice with supporting details, the Contractor shall give a further notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

- (a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
- (b) payment of any such Cost plus profit, which shall be included in the Contract Price.

After receiving this further notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

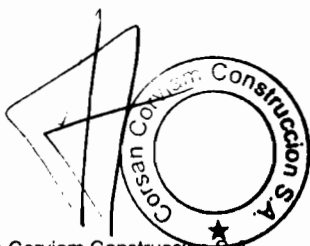
However, if and to the extent that the Engineer's failure was caused by any error or delay by the Contractor, including an error in, or delay in the submission of, any of the Contractor's Documents, the Contractor shall not be entitled to such extension of time, Cost or profit

### 1.10 Employer's Use of Contractor's Documents

As between the Parties, the Contractor shall retain the copyright and other intellectual property rights in the Contractor's Documents and other design documents made by (or on behalf of) the Contractor.

The Contractor shall be deemed (by signing the Contract) to give to the Employer a non-terminable transferable non-exclusive royalty-free licence to copy, use and communicate the Contractor's Documents, including making and using modifications of them. This licence shall:

- (a) apply throughout the actual or intended working life (whichever is longer) of the relevant parts of the Works,
- (b) entitle any person in proper possession of the relevant



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Chief Engineer, Employer  
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Bhubaneswar.



part of the Works to copy, use and communicate the Contractor's Documents for the purposes of completing, operating, maintaining, altering, adjusting, repairing and demolishing the Works, and

- (c) in the case of Contractor's Documents which are in the form of computer programs and other software, permit their use on any computer on the Site and other places as envisaged by the Contract, including replacements of any computers supplied by the Contractor.

The Contractor's Documents and other design documents made by (or on behalf of) the Contractor shall not, without the Contractor's consent, be used, copied or communicated to a third party by (or on behalf of) the Employer for purposes other than those permitted under this Sub-Clause.

### 1.11 Contractor's Use of Employer's Documents

As between the Parties, the Employer shall retain the copyright and other intellectual property rights in the Specification, the Drawings and other documents made by (or on behalf of) the Employer. The Contractor may, at his cost, copy, use, and obtain communication of these documents for the purposes of the Contract. They shall not, without the Employer's consent, be copied, used or communicated to a third party by the Contractor, except as necessary for the purposes of the Contract.

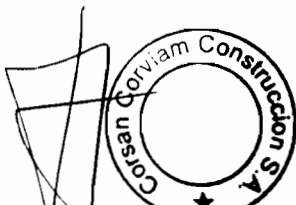
### 1.12 Confidential Details

The Contractor's and the Employer's Personnel shall disclose all such confidential and other information as may be reasonably required in order to verify the Contractor's compliance with the Contract and allow its proper implementation.

Each of them shall treat the details of the Contract as private and confidential, except to the extent necessary to carry out their respective obligations under the Contract or to comply with applicable Laws. Each of them shall not publish or disclose any particulars of the Works prepared by the other Party without the previous agreement of the other Party. However, the Contractor shall be permitted to disclose any publicly available information, or information otherwise required to establish his qualifications to compete for other projects.

### 1.13 Compliance with Laws

The Contractor shall, in performing the Contract, comply with applicable Laws. Unless otherwise stated in the Particular Conditions:



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- (a) the Employer shall have obtained (or shall obtain) the planning, zoning, building permit or similar permission for the Permanent Works, and any other permissions described in the Specification as having been (or to be) obtained by the Employer; and the Employer shall indemnify and hold the Contractor harmless against and from the consequences of any failure to do so; and
- (b) the Contractor shall give all notices, pay all taxes, duties and fees, and obtain all permits, licences and approvals, as required by the Laws in relation to the execution and completion of the Works and the remedying of any defects; and the Contractor shall indemnify and hold the Employer harmless against and from the consequences of any failure to do so, unless the Contractor is impeded to accomplish these actions and shows evidence of its diligence.

#### 1.14 Joint and Several Liability

If the Contractor constitutes (under applicable Laws) a joint venture or other unincorporated grouping of two or more persons:

- (a) these persons shall be deemed to be jointly and severally liable to the Employer for the performance of the Contract;
- (b) these persons shall notify the Employer of their leader who shall have authority to bind the Contractor and each of these persons; and
- (c) the Contractor shall not alter its composition or legal status without the prior consent of the Employer.

#### 1.15 Inspections and Audit by the Bank

The Contractor shall permit, and shall cause its Subcontractors and subconsultants to permit, the Bank and/or persons appointed by the Bank to inspect the Site and all accounts and records relating to the performance of the Contract and the submission of the bid, and to have such accounts and records audited by auditors appointed by the Bank if requested by the Bank. The Contractor's and its Subcontractors' and subconsultants' attention is drawn to Sub-Clause 15.6 [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 1.15 constitute a prohibited practice subject to contract termination (as well as to a determination of ineligibility pursuant to the Bank's prevailing sanctions procedures).

## 2. The Employer

### 2.1 Right of Access to the Site

The Employer shall give the Contractor right of access to, and possession of, all parts of the Site within the time (or times) stated in the Contract Data. The right and possession may not be exclusive to the Contractor. If, under the Contract, the Employer is required to give (to the Contractor) possession of any foundation, structure, plant or means of access, the Employer shall do so in the time and manner stated in the Specification. However, the Employer may withhold any such right or possession until the Performance Security has been received.

If no such time is stated in the Contract Data, the Employer shall give the Contractor right of access to, and possession of, the Site within such times as required to enable the Contractor to proceed without disruption in accordance with the programme submitted under Sub-Clause 8.3 [Programme].

If the Contractor suffers delay and/or incurs Cost as a result of a failure by the Employer to give any such right or possession within such time, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

- (a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
- (b) payment of any such Cost plus profit, which shall be included in the Contract Price.

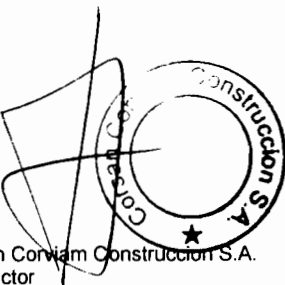
After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

However, if and to the extent that the Employer's failure was caused by any error or delay by the Contractor, including an error in, or delay in the submission of, any of the Contractor's Documents, the Contractor shall not be entitled to such extension of time, Cost or profit.

### 2.2 Permits, Licences or Approvals

The Employer shall provide, at the request of the Contractor, such reasonable assistance as to allow the Contractor to obtain properly:

- (a) copies of the Laws of the Country which are relevant to the Contract but are not readily available, and
- (b) any permits, licences or approvals required by the Laws



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of the Country:

- (i) which the Contractor is required to obtain under Sub-Clause 1.13 [Compliance with Laws],
- (ii) for the delivery of Goods, including clearance through customs, and
- (iii) for the export of Contractor's Equipment when it is removed from the Site.

### 2.3 Employer's Personnel

The Employer shall be responsible for ensuring that the Employer's Personnel and the Employer's other contractors on the Site:

- (a) co-operate with the Contractor's efforts under Sub-Clause 4.6 [Co-operation], and
- (b) take actions similar to those which the Contractor is required to take under sub-paragraphs (a), (b) and (c) of Sub-Clause 4.8 [Safety Procedures] and under Sub-Clause 4.18 [Protection of the Environment].

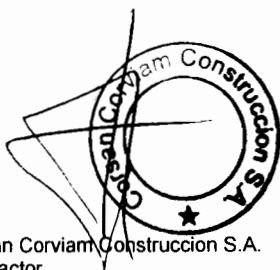
### 2.4 Employer's Financial Arrangements

The Employer shall submit, before the Commencement Date and thereafter within 28 days after receiving any request from the Contractor, reasonable evidence that financial arrangements have been made and are being maintained which will enable the Employer to pay the Contract Price punctually (as estimated at that time) in accordance with Clause 14 [Contract Price and Payment]. Before the Employer makes any material change to his financial arrangements, the Employer shall give notice to the Contractor with detailed particulars.

In addition, if the Bank has notified to the Borrower that the Bank has suspended disbursements under its loan, which finances in whole or in part the execution of the Works, the Employer shall give notice of such suspension to the Contractor with detailed particulars, including the date of such notification, with a copy to the Engineer, within 7 days of the Borrower having received the suspension notification from the Bank. If alternative funds will be available in appropriate currencies to the Employer to continue making payments to the Contractor beyond a date 60 days after the date of Bank notification of the suspension, the Employer shall provide reasonable evidence in such notice of the extent to which such funds will be available.

### 2.5 Employer's Claims

If the Employer considers himself to be entitled to any payment under any Clause of these Conditions or otherwise in connection with the Contract, and/or to any extension of the



Defects Notification Period, the Employer or the Engineer shall give notice and particulars to the Contractor. However, notice is not required for payments due under Sub-Clause 4.19 [Electricity, Water and Gas], under Sub-Clause 4.20 [Employer's Equipment and Free-Issue Material], or for other services requested by the Contractor.

The notice shall be given as soon as practicable and no longer than 28 days after the Employer became aware, or should have become aware, of the event or circumstances giving rise to the claim. A notice relating to any extension of the Defects Notification Period shall be given before the expiry of such period.

The particulars shall specify the Clause or other basis of the claim, and shall include substantiation of the amount and/or extension to which the Employer considers himself to be entitled in connection with the Contract. The Engineer shall then proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine (i) the amount (if any) which the Employer is entitled to be paid by the Contractor, and/or (ii) the extension (if any) of the Defects Notification Period in accordance with Sub-Clause 11.3 [Extension of Defects Notification Period].

This amount may be included as a deduction in the Contract Price and Payment Certificates. The Employer shall only be entitled to set off against or make any deduction from an amount certified in a Payment Certificate, or to otherwise claim against the Contractor, in accordance with this Sub-Clause.

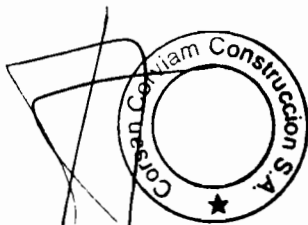
### 3. The Engineer

#### 3.1 Engineer's Duties and Authority

The Employer shall appoint the Engineer who shall carry out the duties assigned to him in the Contract. The Engineer's staff shall include suitably qualified engineers and other professionals who are competent to carry out these duties.

The Engineer shall have no authority to amend the Contract.

The Engineer may exercise the authority attributable to the Engineer as specified in or necessarily to be implied from the Contract. If the Engineer is required to obtain the approval of the Employer before exercising a specified authority, the requirements shall be as stated in the Particular Conditions. The Employer shall promptly inform the Contractor of any change to



the authority attributed to the Engineer.

However, whenever the Engineer exercises a specified authority for which the Employer's approval is required, then (for the purposes of the Contract) the Employer shall be deemed to have given approval.

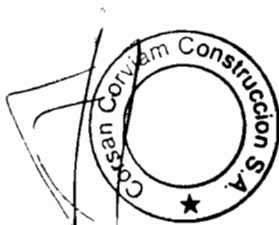
Except as otherwise stated in these Conditions:

- (a) whenever carrying out duties or exercising authority, specified in or implied by the Contract, the Engineer shall be deemed to act for the Employer;
- (b) the Engineer has no authority to relieve either Party of any duties, obligations or responsibilities under the Contract; and
- (c) any approval, check, certificate, consent, examination, inspection, instruction, notice, proposal, request, test, or similar act by the Engineer (including absence of disapproval) shall not relieve the Contractor from any responsibility he has under the Contract, including responsibility for errors, omissions, discrepancies and non-compliances.
- (d) Any act by the Engineer in response to a Contractor's request except otherwise expressly specified shall be notified in writing to the Contractor within 28 days of receipt.


The following provisions shall apply:

The Engineer shall obtain the specific approval of the Employer before taking action under the following Sub-Clauses of these Conditions:

- (a) Sub-Clause 4.12 [Unforeseeable Physical Conditions]: Agreeing or determining an extension of time and/or additional cost.
- (b) Sub-Clause 13.1 [Right to Vary]: Instructing a Variation, except;
  - (i) in an emergency situation as determined by the Engineer, or
  - (ii) if such a Variation would increase the Accepted Contract Amount by less than the percentage



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Contractor

  
Chief Engineer,  
World Bank Projects, Odisha  
Employer  
Chief Engineer  
World Bank Project  
O/o the E.J.C.(Civil), Odisha

specified in the Contract Data.

- (c) Sub-Clause 13.3 [Variation Procedure]: Approving a proposal for Variation submitted by the Contractor in accordance with Sub Clause 13.1 [Right to Vary] or 13.2 [Value Engineering].
- (d) Sub-Clause 13.4 [Payment in Applicable Currencies]: Specifying the amount payable in each of the applicable currencies

Notwithstanding the obligation, as set out above, to obtain approval, if, in the opinion of the Engineer, an emergency occurs affecting the safety of life or of the Works or of adjoining property, he may, without relieving the Contractor of any of his duties and responsibility under the Contract, instruct the Contractor to execute all such work or to do all such things as may, in the opinion of the Engineer, be necessary to abate or reduce the risk. The Contractor shall forthwith comply, despite the absence of approval of the Employer, with any such instruction of the Engineer. The Engineer shall determine an addition to the Contract Price, in respect of such instruction, in accordance with Clause 13 [Variations and Adjustments] and shall notify the Contractor accordingly, with a copy to the Employer.

### 3.2 Delegation by the Engineer

The Engineer may from time to time assign duties and delegate authority to assistants, and may also revoke such assignment or delegation. These assistants may include a resident engineer, and/or independent inspectors appointed to inspect and/or test items of Plant and/or Materials. The assignment, delegation or revocation shall be in writing and shall not take effect until copies have been received by both Parties.

However, unless otherwise agreed by both Parties, the Engineer shall not delegate the authority to determine any matter in accordance with Sub-Clause 3.5 [Determinations].

Assistants shall be suitably qualified persons, who are competent to carry out these duties and exercise this authority, and who are fluent in the language for communications defined in Sub-Clause 1.4 [Law and Language].

Each assistant, to whom duties have been assigned or authority has been delegated, shall only be authorised to issue instructions to the Contractor to the extent defined by the delegation. Any approval, check, certificate, consent, examination, inspection, instruction, notice, proposal, request, test, or similar act by an



assistant, in accordance with the delegation, shall have the same effect as though the act had been an act of the Engineer. However:

- (a) any failure to disapprove any work, Plant or Materials shall not constitute approval, and shall therefore not prejudice the right of the Engineer to reject the work, Plant or Materials;
- (b) if the Contractor questions any determination or instruction of an assistant, the Contractor may refer the matter to the Engineer, who shall promptly confirm, reverse or vary the determination or instruction.

### 3.3 Instructions of the Engineer

The Engineer may issue to the Contractor (at any time) instructions and additional or modified Drawings which may be necessary for the execution of the Works and the remedying of any defects, all in accordance with the Contract. The Contractor shall only take instructions from the Engineer, or from an assistant to whom the appropriate authority has been delegated under this Clause. If an instruction constitutes a Variation, Clause 13 [Variations and Adjustments] shall apply.

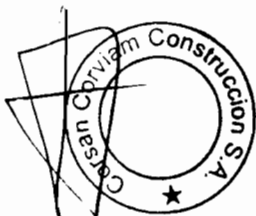
The Contractor shall comply with the instructions given by the Engineer or delegated assistant, on any matter related to the Contract. Whenever practicable, their instructions shall be given in writing. If the Engineer or a delegated assistant:

- (a) gives an oral instruction,
- (b) receives a written confirmation of the instruction, from (or on behalf of) the Contractor, within two working days after giving the instruction, and
- (c) does not reply by issuing a written rejection and/or instruction within two working days after receiving the confirmation,

then the confirmation shall constitute the written instruction of the Engineer or delegated assistant (as the case may be).

### 3.4 Replacement of the Engineer

If the Employer intends to replace the Engineer, the Employer shall, not less than 21 days before the intended date of replacement, give notice to the Contractor of the name, address and relevant experience of the intended replacement Engineer. If the Contractor considers the intended replacement Engineer to be unsuitable, he has the right to raise objection against him by notice to the Employer, with supporting particulars, and the Employer shall give full and fair consideration to this objection.





### 3.5 Determinations

Whenever these Conditions provide that the Engineer shall proceed in accordance with this Sub-Clause 3.5 to agree or determine any matter, the Engineer shall consult with each Party in an endeavour to reach agreement. If agreement is not achieved, the Engineer shall make a fair determination in accordance with the Contract, taking due regard of all relevant circumstances.

The Engineer shall give notice to both Parties of each agreement or determination, with supporting particulars within 28 days from the receipt of the corresponding claim or request except when otherwise specified. Each Party shall give effect to each agreement or determination unless and until revised under Clause 20 [Claims, Disputes and Arbitration].

## 4. The Contractor

### 4.1 Contractor's General Obligations

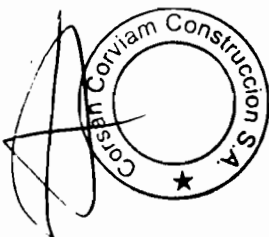
The Contractor shall design (to the extent specified in the Contract), execute and complete the Works in accordance with the Contract and with the Engineer's instructions, and shall remedy any defects in the Works.

The Contractor shall provide the Plant and Contractor's Documents specified in the Contract, and all Contractor's Personnel, Goods, consumables and other things and services, whether of a temporary or permanent nature, required in and for this design, execution, completion and remedying of defects.

All equipment, material, and services to be incorporated in or required for the Works shall have their origin in any eligible source country as defined by the Bank.

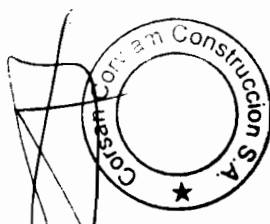
The Contractor shall be responsible for the adequacy, stability and safety of all Site operations and of all methods of construction. Except to the extent specified in the Contract, the Contractor (i) shall be responsible for all Contractor's Documents, Temporary Works, and such design of each item of Plant and Materials as is required for the item to be in accordance with the Contract, and (ii) shall not otherwise be responsible for the design or specification of the Permanent Works.

The Contractor shall, whenever required by the Engineer, submit details of the arrangements and methods which the Contractor proposes to adopt for the execution of the Works. No significant alteration to these arrangements and methods shall be made without this having previously been notified to the Engineer.



If the Contract specifies that the Contractor shall design any part of the Permanent Works, then unless otherwise stated in the Particular Conditions:

- (a) the Contractor shall submit to the Engineer the Contractor's Documents for this part in accordance with the procedures specified in the Contract;
- (b) these Contractor's Documents shall be in accordance with the Specification and Drawings, shall be written in the language for communications defined in Sub-Clause 1.4 [Law and Language], and shall include additional information required by the Engineer to add to the Drawings for co-ordination of each Party's designs;
- (c) the Contractor shall be responsible for this part and it shall, when the Works are completed, be fit for such purposes for which the part is intended as are specified in the Contract; and
- (d) prior to the commencement of the Tests on Completion, the Contractor shall submit to the Engineer the "as-built" documents and, if applicable, operation and maintenance manuals in accordance with the Specification and in sufficient detail for the Employer to operate, maintain, dismantle, reassemble, adjust and repair this part of the Works. Such part shall not be considered to be completed for the purposes of taking-over under Sub-Clause 10.1 [Taking Over of the Works and Sections] until these documents and manuals have been submitted to the Engineer.



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Contractor



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

#### 4.2 Performance Security

The Contractor shall obtain (at his cost) a Performance Security for proper performance, in the amount and currencies stated in the Contract Data. If an amount is not stated in the Contract Data, this Sub-Clause shall not apply.

The Contractor shall deliver the Performance Security to the Employer within 28 days after receiving the Letter of Acceptance, and shall send a copy to the Engineer. The Performance Security shall be issued by an entity and from within a country (or other jurisdiction) approved by the Employer, and shall be in the form annexed to the Particular Conditions or in another form approved by the Employer.

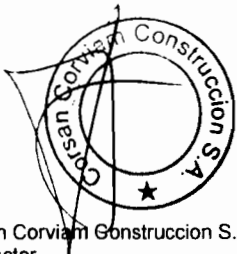
The Contractor shall ensure that the Performance Security is valid and enforceable until the Contractor has executed and completed the Works and remedied any defects. If the terms of the Performance Security specify its expiry date, and the Contractor has not become entitled to receive the Performance Certificate by the date 28 days prior to the expiry date, the Contractor shall extend the validity of the Performance Security until the Works have been completed and any defects have been remedied.

The Employer shall not make a claim under the Performance Security, except for amounts to which the Employer is entitled under the Contract.

The Employer shall indemnify and hold the Contractor harmless against and from all damages, losses and expenses (including legal fees and expenses) resulting from a claim under the Performance Security to the extent to which the Employer was not entitled to make the claim.

The Employer shall return the Performance Security to the Contractor within 21 days after receiving a copy of the Performance Certificate.

Without limitation to the provisions of the rest of this Sub-Clause, whenever the Engineer determines an addition or a reduction to the Contract Price as a result of a change in cost and/or legislation or as a result of a Variation amounting to more than 25 percent of the portion of the Contract Price payable in a specific currency, the Contractor shall at the Engineer's request promptly increase, or may decrease, as the case may be, the value of the Performance Security in that currency by an equal percentage.



#### 4.3 Contractor's Representative

The Contractor shall appoint the Contractor's Representative and shall give him all authority necessary to act on the Contractor's behalf under the Contract.

Unless the Contractor's Representative is named in the Contract, the Contractor shall, prior to the Commencement Date, submit to the Engineer for consent the name and particulars of the person the Contractor proposes to appoint as Contractor's Representative. If consent is withheld or subsequently revoked in terms of Sub-Clause 6.9 [Contractor's Personnel], or if the appointed person fails to act as Contractor's Representative, the Contractor shall similarly submit the name and particulars of another suitable person for such appointment.

The Contractor shall not, without the prior consent of the Engineer, revoke the appointment of the Contractor's Representative or appoint a replacement.

The whole time of the Contractor's Representative shall be given to directing the Contractor's performance of the Contract. If the Contractor's Representative is to be temporarily absent from the Site during the execution of the Works, a suitable replacement person shall be appointed, subject to the Engineer's prior consent, and the Engineer shall be notified accordingly.

The Contractor's Representative shall, on behalf of the Contractor, receive instructions under Sub-Clause 3.3 [Instructions of the Engineer].

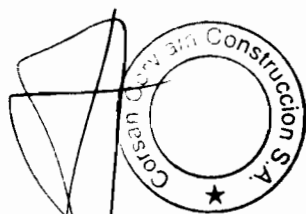
The Contractor's Representative may delegate any powers, functions and authority to any competent person, and may at any time revoke the delegation. Any delegation or revocation shall not take effect until the Engineer has received prior notice signed by the Contractor's Representative, naming the person and specifying the powers, functions and authority being delegated or revoked.

The Contractor's Representative shall be fluent in the language for communications defined in Sub-Clause 1.4 [Law and Language]. If the Contractor's Representative's delegates are not fluent in the said language, the Contractor shall make competent interpreters available during all working hours in a number deemed sufficient by the Engineer.

#### 4.4 Subcontractors

The Contractor shall not subcontract the whole of the Works.

The Contractor shall be responsible for the acts or defaults of any Subcontractor, his agents or employees, as if they were the acts or defaults of the Contractor. Unless otherwise stated in the



**Particular Conditions:**

- (a) the Contractor shall not be required to obtain consent to suppliers solely of Materials, or to a subcontract for which the Subcontractor is named in the Contract;
- (b) the prior consent of the Engineer shall be obtained to other proposed Subcontractors;
- (c) the Contractor shall give the Engineer not less than 28 days' notice of the intended date of the commencement of each Subcontractor's work, and of the commencement of such work on the Site; and
- (d) each subcontract shall include provisions which would entitle the Employer to require the subcontract to be assigned to the Employer under Sub-Clause 4.5 [Assignment of Benefit of Subcontract] (if or when applicable) or in the event of termination under Sub-Clause 15.2 [Termination by Employer].

The Contractor shall ensure that the requirements imposed on the Contractor by Sub-Clause 1.12 [Confidential Details] apply equally to each Subcontractor.

Where practicable, the Contractor shall give fair and reasonable opportunity for contractors from the Country to be appointed as Subcontractors.

**4.5 Assignment of Benefit of Subcontract**

If a Subcontractor's obligations extend beyond the expiry date of the relevant Defects Notification Period and the Engineer, prior to this date, instructs the Contractor to assign the benefit of such obligations to the Employer, then the Contractor shall do so. Unless otherwise stated in the assignment, the Contractor shall have no liability to the Employer for the work carried out by the Subcontractor after the assignment takes effect.

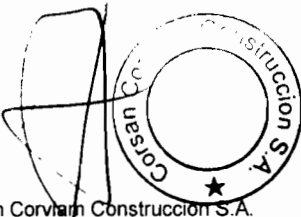
**4.6 Co-operation**


The Contractor shall, as specified in the Contract or as instructed by the Engineer, allow appropriate opportunities for carrying out work to:

- (a) the Employer's Personnel,
- (b) any other contractors employed by the Employer, and
- (c) the personnel of any legally constituted public authorities,

who may be employed in the execution on or near the Site of any work not included in the Contract.

Any such instruction shall constitute a Variation if and to the

  
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Contractor

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

extent that it causes the Contractor to suffer delays and/or to incur Unforeseeable Cost. Services for these personnel and other contractors may include the use of Contractor's Equipment, Temporary Works or access arrangements which are the responsibility of the Contractor.

If, under the Contract, the Employer is required to give to the Contractor possession of any foundation, structure, plant or means of access in accordance with Contractor's Documents, the Contractor shall submit such documents to the Engineer in the time and manner stated in the Specification.

#### 4.7 Setting Out

The Contractor shall set out the Works in relation to original points, lines and levels of reference specified in the Contract or notified by the Engineer. The Contractor shall be responsible for the correct positioning of all parts of the Works, and shall rectify any error in the positions, levels, dimensions or alignment of the Works.

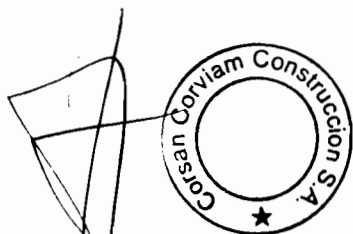
The Employer shall be responsible for any errors in these specified or notified items of reference, but the Contractor shall use reasonable efforts to verify their accuracy before they are used.

If the Contractor suffers delay and/or incurs Cost from executing work which was necessitated by an error in these items of reference, and an experienced contractor could not reasonably have discovered such error and avoided this delay and/or Cost, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

- (a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
- (b) payment of any such Cost plus profit, which shall be included in the Contract Price.

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine (i) whether and (if so) to what extent the error could not reasonably have been discovered, and (ii) the matters described in sub-paragraphs (a) and (b) above related to this extent.

#### 4.8 Safety Procedures The Contractor shall:



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Contractor

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World Bank, Employer  
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- (a) comply with all applicable safety regulations,
- (b) take care for the safety of all persons entitled to be on the Site,
- (c) use reasonable efforts to keep the Site and Works clear of unnecessary obstruction so as to avoid danger to these persons,
- (d) provide fencing, lighting, guarding and watching of the Works until completion and taking over under Clause 10 [Employer's Taking Over], and
- (e) provide any Temporary Works (including roadways, footways, guards and fences) which may be necessary, because of the execution of the Works, for the use and protection of the public and of owners and occupiers of adjacent land.

#### 4.9 Quality Assurance

The Contractor shall institute a quality assurance system to demonstrate compliance with the requirements of the Contract. The system shall be in accordance with the details stated in the Contract. The Engineer shall be entitled to audit any aspect of the system.

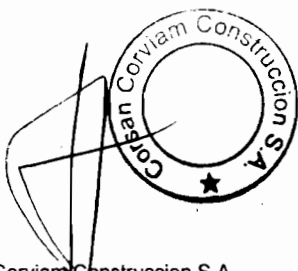
Details of all procedures and compliance documents shall be submitted to the Engineer for information before each design and execution stage is commenced. When any document of a technical nature is issued to the Engineer, evidence of the prior approval by the Contractor himself shall be apparent on the document itself.

Compliance with the quality assurance system shall not relieve the Contractor of any of his duties, obligations or responsibilities under the Contract.

#### 4.10 Site Data

The Employer shall have made available to the Contractor for his information, prior to the Base Date, all relevant data in the Employer's possession on sub-surface and hydrological conditions at the Site, including environmental aspects. The Employer shall similarly make available to the Contractor all such data which come into the Employer's possession after the Base Date. The Contractor shall be responsible for interpreting all such data.

To the extent which was practicable (taking account of cost and time), the Contractor shall be deemed to have obtained all necessary information as to risks, contingencies and other circumstances which may influence or affect the Tender or



Works. To the same extent, the Contractor shall be deemed to have inspected and examined the Site, its surroundings, the above data and other available information, and to have been satisfied before submitting the Tender as to all relevant matters, including (without limitation):

- (a) the form and nature of the Site, including sub-surface conditions,
- (b) the hydrological and climatic conditions,
- (c) the extent and nature of the work and Goods necessary for the execution and completion of the Works and the remedying of any defects,
- (d) the Laws, procedures and labour practices of the Country, and
- (e) the Contractor's requirements for access, accommodation, facilities, personnel, power, transport, water and other services.

**4.11 Sufficiency of the Accepted Contract Amount**

The Contractor shall be deemed to:

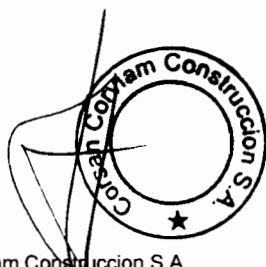
- (a) have satisfied himself as to the correctness and sufficiency of the Accepted Contract Amount, and
- (b) have based the Accepted Contract Amount on the data, interpretations, necessary information, inspections, examinations and satisfaction as to all relevant matters referred to in Sub-Clause 4.10 [Site Data].

Unless otherwise stated in the Contract, the Accepted Contract Amount covers all the Contractor's obligations under the Contract (including those under Provisional Sums, if any) and all things necessary for the proper execution and completion of the Works and the remedying of any defects.

**4.12 Unforeseeable Physical Conditions**

In this Sub-Clause, "physical conditions" means natural physical conditions and man-made and other physical obstructions and pollutants, which the Contractor encounters at the Site when executing the Works, including sub-surface and hydrological conditions but excluding climatic conditions.

If the Contractor encounters adverse physical conditions which he considers to have been Unforeseeable, the Contractor shall give notice to the Engineer as soon as practicable.





This notice shall describe the physical conditions, so that they can be inspected by the Engineer, and shall set out the reasons why the Contractor considers them to be Unforeseeable. The Contractor shall continue executing the Works, using such proper and reasonable measures as are appropriate for the physical conditions, and shall comply with any instructions which the Engineer may give. If an instruction constitutes a Variation, Clause 13 [Variations and Adjustments] shall apply.

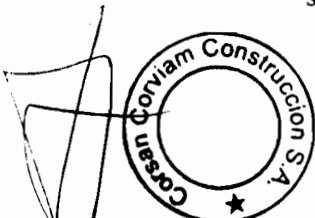
If and to the extent that the Contractor encounters physical conditions which are Unforeseeable, gives such a notice, and suffers delay and/or incurs Cost due to these conditions, the Contractor shall be entitled subject to notice under Sub-Clause 20.1 [Contractor's Claims] to:

- (a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
- (b) payment of any such Cost, which shall be included in the Contract Price.

Upon receiving such notice and inspecting and/or investigating these physical conditions, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine (i) whether and (if so) to what extent these physical conditions were Unforeseeable, and (ii) the matters described in sub-paragraphs (a) and (b) above related to this extent.

However, before additional Cost is finally agreed or determined under sub-paragraph (ii), the Engineer may also review whether other physical conditions in similar parts of the Works (if any) were more favourable than could reasonably have been foreseen when the Contractor submitted the Tender. If and to the extent that these more favourable conditions were encountered, the Engineer may proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine the reductions in Cost which were due to these conditions, which may be included (as deductions) in the Contract Price and Payment Certificates. However, the net effect of all adjustments under sub-paragraph (b) and all these reductions, for all the physical conditions encountered in similar parts of the Works, shall not result in a net reduction in the Contract Price.

The Engineer shall take account of any evidence of the physical conditions foreseen by the Contractor when submitting the Tender, which shall be made available by the Contractor, but shall not be bound by the Contractor's interpretation of any such



evidence.

#### 4.13 Rights of Way and Facilities

Unless otherwise specified in the Contract the Employer shall provide access to and possession of the Site including special and/or temporary rights-of-way which are necessary for the Works. The Contractor shall obtain, at his risk and cost, any additional rights of way or facilities outside the Site which he may require for the purposes of the Works.

#### 4.14 Avoidance of Interference

The Contractor shall not interfere unnecessarily or improperly with:

- (a) the convenience of the public, or
- (b) the access to and use and occupation of all roads and footpaths, irrespective of whether they are public or in the possession of the Employer or of others.


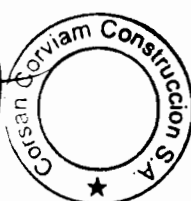
The Contractor shall indemnify and hold the Employer harmless against and from all damages, losses and expenses (including legal fees and expenses) resulting from any such unnecessary or improper interference.

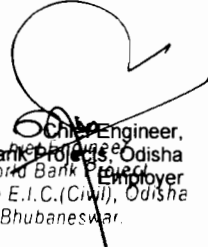
#### 4.15 Access Route

The Contractor shall be deemed to have been satisfied as to the suitability and availability of access routes to the Site at Base Date. The Contractor shall use reasonable efforts to prevent any road or bridge from being damaged by the Contractor's traffic or by the Contractor's Personnel. These efforts shall include the proper use of appropriate vehicles and routes.

Except as otherwise stated in these Conditions:

- (a) the Contractor shall (as between the Parties) be responsible for any maintenance which may be required for his use of access routes;
- (b) the Contractor shall provide all necessary signs or directions along access routes, and shall obtain any permission which may be required from the relevant authorities for his use of routes, signs and directions;
- (c) the Employer shall not be responsible for any claims which may arise from the use or otherwise of any access route;
- (d) the Employer does not guarantee the suitability or availability of particular access routes; and
- (e) Costs due to non-suitability or non-availability, for the use required by the Contractor, of access routes shall be borne



  
 Corsan Corviam Construction S.A.  
 Contractor


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

by the Contractor.

#### 4.16 Transport of Goods

Unless otherwise stated in the Particular Conditions:

- (a) the Contractor shall give the Engineer not less than 21 days' notice of the date on which any Plant or a major item of other Goods will be delivered to the Site;
- (b) the Contractor shall be responsible for packing, loading, transporting, receiving, unloading, storing and protecting all Goods and other things required for the Works; and
- (c) the Contractor shall indemnify and hold the Employer harmless against and from all damages, losses and expenses (including legal fees and expenses) resulting from the transport of Goods, and shall negotiate and pay all claims arising from their transport.

#### 4.17 Contractor's Equipment

The Contractor shall be responsible for all Contractor's Equipment. When brought on to the Site, Contractor's Equipment shall be deemed to be exclusively intended for the execution of the Works. The Contractor shall not remove from the Site any major items of Contractor's Equipment without the consent of the Engineer. However, consent shall not be required for vehicles transporting Goods or Contractor's Personnel off Site.

#### 4.18 Protection of the Environment

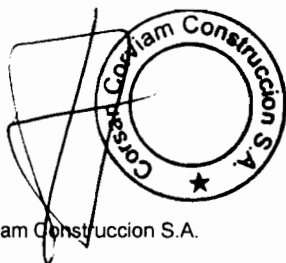
The Contractor shall take all reasonable steps to protect the environment (both on and off the Site) and to limit damage and nuisance to people and property resulting from pollution, noise and other results of his operations.

The Contractor shall ensure that emissions, surface discharges and effluent from the Contractor's activities shall not exceed the values stated in the Specification or prescribed by applicable Laws.

#### 4.19 Electricity, Water and Gas

The Contractor shall, except as stated below, be responsible for the provision of all power, water and other services he may require for his construction activities and to the extent defined in the Specifications, for the tests.

The Contractor shall be entitled to use for the purposes of the Works such supplies of electricity, water, gas and other services as may be available on the Site and of which details and prices are given in the Specification. The Contractor shall, at his risk and cost, provide any apparatus necessary for his use of these



services and for measuring the quantities consumed.

The quantities consumed and the amounts due (at these prices) for such services shall be agreed or determined by the Engineer in accordance with Sub-Clause 2.5 [Employer's Claims] and Sub-Clause 3.5 [Determinations]. The Contractor shall pay these amounts to the Employer.

**4.20 Employer's Equipment and Free-Issue Materials**

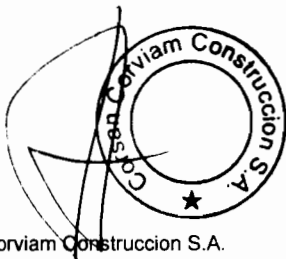
The Employer shall make the Employer's Equipment (if any) available for the use of the Contractor in the execution of the Works in accordance with the details, arrangements and prices stated in the Specification. Unless otherwise stated in the Specification:

- (a) the Employer shall be responsible for the Employer's Equipment, except that
- (b) the Contractor shall be responsible for each item of Employer's Equipment whilst any of the Contractor's Personnel is operating it, driving it, directing it or in possession or control of it.

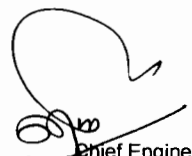
The appropriate quantities and the amounts due (at such stated prices) for the use of Employer's Equipment shall be agreed or determined by the Engineer in accordance with Sub-Clause 2.5 [Employer's Claims] and Sub-Clause 3.5 [Determinations]. The Contractor shall pay these amounts to the Employer.

The Employer shall supply, free of charge, the "free-issue materials" (if any) in accordance with the details stated in the Specification. The Employer shall, at his risk and cost, provide these materials at the time and place specified in the Contract. The Contractor shall then visually inspect them, and shall promptly give notice to the Engineer of any shortage, defect or default in these materials. Unless otherwise agreed by both Parties, the Employer shall immediately rectify the notified shortage, defect or default.

After this visual inspection, the free-issue materials shall come under the care, custody and control of the Contractor. The Contractor's obligations of inspection, care, custody and control shall not relieve the Employer of liability for any shortage, defect or default not apparent from a visual inspection.



Corsan Corviam Construcción S.A.  
Contractor

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

#### 4.21 Progress Reports

Unless otherwise stated in the Particular Conditions, monthly progress reports shall be prepared by the Contractor and submitted to the Engineer in six copies. The first report shall cover the period up to the end of the first calendar month following the Commencement Date. Reports shall be submitted monthly thereafter, each within 7 days after the last day of the period to which it relates.

Reporting shall continue until the Contractor has completed all work which is known to be outstanding at the completion date stated in the Taking-Over Certificate for the Works.

Each report shall include:

- (a) charts and detailed descriptions of progress, including each stage of design (if any), Contractor's Documents, procurement, manufacture, delivery to Site, construction, erection and testing; and including these stages for work by each nominated Subcontractor (as defined in Clause 5 [Nominated Subcontractors]),
- (b) photographs showing the status of manufacture and of progress on the Site;
- (c) for the manufacture of each main item of Plant and Materials, the name of the manufacturer, manufacture location, percentage progress, and the actual or expected dates of:
  - (i) commencement of manufacture,
  - (ii) Contractor's inspections,
  - (iii) tests, and
  - (iv) shipment and arrival at the Site;
- (d) the details described in Sub-Clause 6.10 [Records of Contractor's Personnel and Equipment];
- (e) copies of quality assurance documents, test results and certificates of Materials;
- (f) list of notices given under Sub-Clause 2.5 [Employer's Claims] and notices given under Sub-Clause 20.1 [Contractor's Claims];
- (g) safety statistics, including details of any hazardous

incidents and activities relating to environmental aspects and public relations; and

- (h) comparisons of actual and planned progress, with details of any events or circumstances which may jeopardise the completion in accordance with the Contract, and the measures being (or to be) adopted to overcome delays.

#### 4.22 Security of the Site

Unless otherwise stated in the Particular Conditions:

- (a) the Contractor shall be responsible for keeping unauthorised persons off the Site, and
- (b) authorised persons shall be limited to the Contractor's Personnel and the Employer's Personnel; and to any other personnel notified to the Contractor, by the Employer or the Engineer, as authorised personnel of the Employer's other contractors on the Site.

#### 4.23 Contractor's Operations on Site

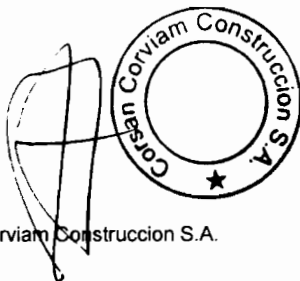
The Contractor shall confine his operations to the Site, and to any additional areas which may be obtained by the Contractor and agreed by the Engineer as additional working areas. The Contractor shall take all necessary precautions to keep Contractor's Equipment and Contractor's Personnel within the Site and these additional areas, and to keep them off adjacent land.

During the execution of the Works, the Contractor shall keep the Site free from all unnecessary obstruction, and shall store or dispose of any Contractor's Equipment or surplus materials. The Contractor shall clear away and remove from the Site any wreckage, rubbish and Temporary Works which are no longer required.

Upon the issue of a Taking-Over Certificate, the Contractor shall clear away and remove, from that part of the Site and Works to which the Taking-Over Certificate refers, all Contractor's Equipment, surplus material, wreckage, rubbish and Temporary Works. The Contractor shall leave that part of the Site and the Works in a clean and safe condition. However, the Contractor may retain on Site, during the Defects Notification Period, such Goods as are required for the Contractor to fulfil obligations under the Contract.

#### 4.24 Fossils

All fossils, coins, articles of value or antiquity, and structures and other remains or items of geological or archaeological interest found on the Site shall be placed under the care and authority of the Employer. The Contractor shall take reasonable precautions to prevent Contractor's Personnel or other persons



from removing or damaging any of these findings.

The Contractor shall, upon discovery of any such finding, promptly give notice to the Engineer, who shall issue instructions for dealing with it. If the Contractor suffers delay and/or incurs Cost from complying with the instructions, the Contractor shall give a further notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

- (a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
- (b) payment of any such Cost, which shall be included in the Contract Price.

After receiving this further notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

## 5. Nominated Subcontractors

### 5.1 Definition of "nominated Subcontractor"

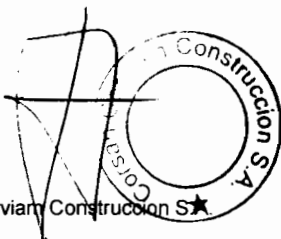
In the Contract, "nominated Subcontractor" means a Subcontractor:

- (a) who is stated in the Contract as being a nominated Subcontractor, or
- (b) whom the Engineer, under Clause 13 [Variations and Adjustments], instructs the Contractor to employ as a Subcontractor subject to Sub-Clause 5.2 [Objection to Notification].

### 5.2 Objection to Nomination

The Contractor shall not be under any obligation to employ a nominated Subcontractor against whom the Contractor raises reasonable objection by notice to the Engineer as soon as practicable, with supporting particulars. An objection shall be deemed reasonable if it arises from (among other things) any of the following matters, unless the Employer agrees in writing to indemnify the Contractor against and from the consequences of the matter:

- (a) there are reasons to believe that the Subcontractor does not have sufficient competence, resources or financial strength;
- (b) the nominated Subcontractor does not accept to indemnify the Contractor against and from any negligence or misuse of Goods by the nominated Subcontractor, his agents and



employees; or

- (c) the nominated Subcontractor does not accept to enter into a subcontract which specifies that, for the subcontracted work (including design, if any), the nominated Subcontractor shall:
- (i) undertake to the Contractor such obligations and liabilities as will enable the Contractor to discharge his obligations and liabilities under the Contract;
  - (ii) indemnify the Contractor against and from all obligations and liabilities arising under or in connection with the Contract and from the consequences of any failure by the Subcontractor to perform these obligations or to fulfil these liabilities; and
  - (iii) be paid only if and when the Contractor has received from the Employer payments for sums due under the Subcontract referred to under Sub-Clause 5.3 [Payment to nominated Subcontractors].

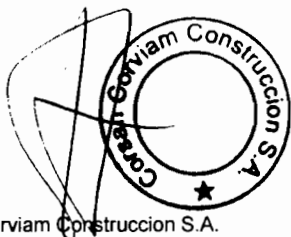
### 5.3 Payments to nominated Subcontractors

The Contractor shall pay to the nominated Subcontractor the amounts shown on the nominated Subcontractor's invoices approved by the Contractor which the Engineer certifies to be due in accordance with the subcontract. These amounts plus other charges shall be included in the Contract Price in accordance with sub-paragraph (b) of Sub-Clause 13.5 [Provisional Sums], except as stated in Sub-Clause 5.4 [Evidence of Payments].

### 5.4 Evidence of Payments

Before issuing a Payment Certificate which includes an amount payable to a nominated Subcontractor, the Engineer may request the Contractor to supply reasonable evidence that the nominated Subcontractor has received all amounts due in accordance with previous Payment Certificates, less applicable deductions for retention or otherwise. Unless the Contractor:

- (a) submits this reasonable evidence to the Engineer, or
- (b)
  - (i) satisfies the Engineer in writing that the Contractor is reasonably entitled to withhold or refuse to pay these amounts, and
  - (ii) submits to the Engineer reasonable evidence that the nominated Subcontractor has been notified of the





Contractor's entitlement,

then the Employer may (at his sole discretion) pay, direct to the nominated Subcontractor, part or all of such amounts previously certified (less applicable deductions) as are due to the nominated Subcontractor and for which the Contractor has failed to submit the evidence described in sub-paragraphs (a) or (b) above. The Contractor shall then repay, to the Employer, the amount which the nominated Subcontractor was directly paid by the Employer.

## 6. Staff and Labour

### 6.1 Engagement of Staff and Labour

Except as otherwise stated in the Specification, the Contractor shall make arrangements for the engagement of all staff and labour, local or otherwise, and for their payment, feeding, transport, and, when appropriate, housing.

The Contractor is encouraged, to the extent practicable and reasonable, to employ staff and labour with appropriate qualifications and experience from sources within the Country.

### 6.2 Rates of Wages and Conditions of Labour

The Contractor shall pay rates of wages, and observe conditions of labour, which are not lower than those established for the trade or industry where the work is carried out. If no established rates or conditions are applicable, the Contractor shall pay rates of wages and observe conditions which are not lower than the general level of wages and conditions observed locally by employers whose trade or industry is similar to that of the Contractor.

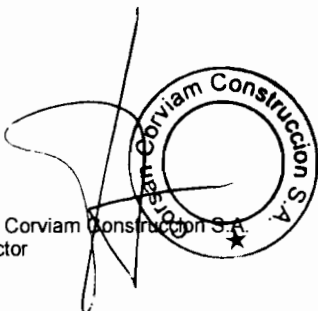
The Contractor shall inform the Contractor's Personnel about their liability to pay personal income taxes in the Country in respect of such of their salaries, wages, allowances and any benefits as are subject to tax under the Laws of the Country for the time being in force, and the Contractor shall perform such duties in regard to such deductions thereof as may be imposed on him by such Laws.

### 6.3 Persons in the Service of Employer

The Contractor shall not recruit, or attempt to recruit, staff and labour from amongst the Employer's Personnel.

### 6.4 Labour Laws

The Contractor shall comply with all the relevant labour Laws applicable to the Contractor's Personnel, including Laws relating to their employment, health, safety, welfare, immigration and emigration, and shall allow them all their legal rights.



The Contractor shall require his employees to obey all applicable Laws, including those concerning safety at work.

#### 6.5 Working Hours

No work shall be carried out on the Site on locally recognised days of rest, or outside the normal working hours stated in the Contract Data, unless:

- (a) otherwise stated in the Contract,
- (b) the Engineer gives consent, or
- (c) the work is unavoidable, or necessary for the protection of life or property or for the safety of the Works, in which case the Contractor shall immediately advise the Engineer.

#### 6.6 Facilities for Staff and Labour

Except as otherwise stated in the Specification, the Contractor shall provide and maintain all necessary accommodation and welfare facilities for the Contractor's Personnel. The Contractor shall also provide facilities for the Employer's Personnel as stated in the Specification.

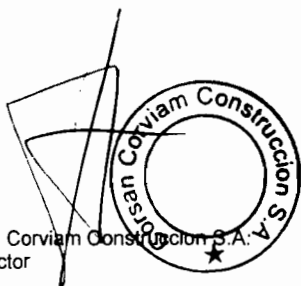
The Contractor shall not permit any of the Contractor's Personnel to maintain any temporary or permanent living quarters within the structures forming part of the Permanent Works.

#### 6.7 Health and Safety

The Contractor shall at all times take all reasonable precautions to maintain the health and safety of the Contractor's Personnel. In collaboration with local health authorities, the Contractor shall ensure that medical staff, first aid facilities, sick bay and ambulance service are available at all times at the Site and at any accommodation for Contractor's and Employer's Personnel, and that suitable arrangements are made for all necessary welfare and hygiene requirements and for the prevention of epidemics.

The Contractor shall appoint an accident prevention officer at the Site, responsible for maintaining safety and protection against accidents. This person shall be qualified for this responsibility, and shall have the authority to issue instructions and take protective measures to prevent accidents. Throughout the execution of the Works, the Contractor shall provide whatever is required by this person to exercise this responsibility and authority.

The Contractor shall send, to the Engineer, details of any accident as soon as practicable after its occurrence. The Contractor shall maintain records and make reports concerning




health, safety and welfare of persons, and damage to property, as the Engineer may reasonably require.


**HIV-AIDS Prevention.** The Contractor shall conduct an HIV-AIDS awareness programme via an approved service provider, and shall undertake such other measures as are specified in this Contract to reduce the risk of the transfer of the HIV virus between and among the Contractor's Personnel and the local community, to promote early diagnosis and to assist affected individuals.

The Contractor shall throughout the contract (including the Defects Notification Period): (i) conduct Information, Education and Consultation Communication (IEC) campaigns, at least every other month, addressed to all the Site staff and labour (including all the Contractor's employees, all Sub-Contractors and Consultants' employees, and all truck drivers and crew making deliveries to Site for construction activities) and to the immediate local communities, concerning the risks, dangers and impact, and appropriate avoidance behavior with respect to of Sexually Transmitted Diseases (STD)—or Sexually Transmitted Infections (STI) in general and HIV/AIDS in particular; (ii) provide male or female condoms for all Site staff and labour as appropriate; and (iii) provide for STI and HIV/AIDS screening, diagnosis, counseling and referral to a dedicated national STI and HIV/AIDS program, (unless otherwise agreed) of all Site staff and labour.

The Contractor shall include in the program to be submitted for the execution of the Works under Sub-Clause 8.3 [Programme] an alleviation program for Site staff and labour and their families in respect of Sexually Transmitted Infections (STI) and Sexually Transmitted Diseases (STD) including HIV/AIDS. The STI, STD and HIV/AIDS alleviation program shall indicate when, how and at what cost the Contractor plans to satisfy the requirements of this Sub-Clause and the related specification. For each component, the program shall detail the resources to be provided or utilized and any related sub-contracting proposed. The program shall also include provision of a detailed cost estimate with supporting documentation. Payment to the Contractor for preparation and implementation this program shall not exceed the Provisional Sum dedicated for this purpose.



Corsan Corviam Construcción S.A.  
Contractor



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

**6.8 Contractor's  
Superintendence**

Throughout the execution of the Works, and as long thereafter as is necessary to fulfil the Contractor's obligations, the Contractor shall provide all necessary superintendence to plan, arrange, direct, manage, inspect and test the work.

Superintendence shall be given by a sufficient number of persons having adequate knowledge of the language for communications (defined in Sub-Clause 1.4 [Law and Language]) and of the operations to be carried out (including the methods and techniques required, the hazards likely to be encountered and methods of preventing accidents), for the satisfactory and safe execution of the Works.

**6.9 Contractor's  
Personnel**

The Contractor's Personnel shall be appropriately qualified, skilled and experienced in their respective trades or occupations. The Engineer may require the Contractor to remove (or cause to be removed) any person employed on the Site or Works, including the Contractor's Representative if applicable, who:

- (a) persists in any misconduct or lack of care,
- (b) carries out duties incompetently or negligently,
- (c) fails to conform with any provisions of the Contract, or
- (d) persists in any conduct which is prejudicial to safety, health, or the protection of the environment.

If appropriate, the Contractor shall then appoint (or cause to be appointed) a suitable replacement person.

**6.10 Records of  
Contractor's  
Personnel and  
Equipment**

The Contractor shall submit, to the Engineer, details showing the number of each class of Contractor's Personnel and of each type of Contractor's Equipment on the Site. Details shall be submitted each calendar month, in a form approved by the Engineer, until the Contractor has completed all work which is known to be outstanding at the completion date stated in the Taking-Over Certificate for the Works.

**6.11 Disorderly  
Conduct**

The Contractor shall at all times take all reasonable precautions to prevent any unlawful, riotous or disorderly conduct by or amongst the Contractor's Personnel, and to preserve peace and protection of persons and property on and near the Site.

**6.12 Foreign  
Personnel**

The Contractor may bring in to the Country any foreign personnel who are necessary for the execution of the Works to the extent allowed by the applicable Laws. The Contractor shall ensure that these personnel are provided with the required residence visas and work permits. The Employer will, if

requested by the Contractor, use his best endeavours in a timely and expeditious manner to assist the Contractor in obtaining any local, state, national, or government permission required for bringing in the Contractor's personnel.

The Contractor shall be responsible for the return of these personnel to the place where they were recruited or to their domicile. In the event of the death in the Country of any of these personnel or members of their families, the Contractor shall similarly be responsible for making the appropriate arrangements for their return or burial.

**6.13 Supply of Foodstuffs**

The Contractor shall arrange for the provision of a sufficient supply of suitable food as may be stated in the Specification at reasonable prices for the Contractor's Personnel for the purposes of or in connection with the Contract.

**6.14 Supply of Water**

The Contractor shall, having regard to local conditions, provide on the Site an adequate supply of drinking and other water for the use of the Contractor's Personnel.

**6.15 Measures against Insect and Pest Nuisance**

The Contractor shall at all times take the necessary precautions to protect the Contractor's Personnel employed on the Site from insect and pest nuisance, and to reduce their danger to health. The Contractor shall comply with all the regulations of the local health authorities, including use of appropriate insecticide.

**6.16 Alcoholic Liquor or Drugs**

The Contractor shall not, otherwise than in accordance with the Laws of the Country, import, sell, give barter or otherwise dispose of any alcoholic liquor or drugs, or permit or allow importation, sale, gift barter or disposal thereto by Contractor's Personnel.

**6.17 Arms and Ammunition**

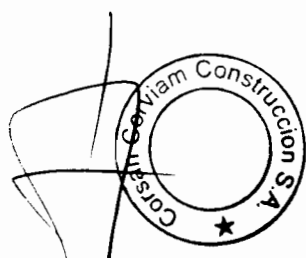
The Contractor shall not give, barter, or otherwise dispose of, to any person, any arms or ammunition of any kind, or allow Contractor's Personnel to do so.

**6.18 Festivals and Religious Customs**

The Contractor shall respect the Country's recognized festivals, days of rest and religious or other customs.

**6.19 Funeral Arrangements**

The Contractor shall be responsible, to the extent required by local regulations, for making any funeral arrangements for any of his local employees who may die while engaged upon the Works.



**6.20 Prohibition of Forced or Compulsory Labour**

The contractor shall not employ "forced or compulsory labour" in any form. "Forced or compulsory labour" consists of all work or service, not voluntarily performed, that is extracted from an individual under threat of force or penalty.

**6.21 Prohibition of Harmful Child Labour**

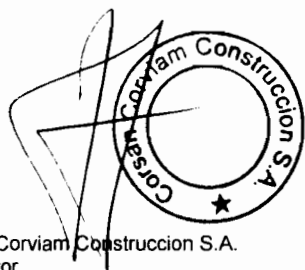
The Contractor shall not employ any child to perform any work that is economically exploitative, or is likely to be hazardous to, or to interfere with, the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development.

**6.22 Employment Records of Workers**

The Contractor shall keep complete and accurate records of the employment of labour at the Site. The records shall include the names, ages, genders, hours worked and wages paid to all workers. These records shall be summarized on a monthly basis and submitted to the Engineer, and these records shall be available for inspection by Auditors during normal working hours. These records shall be included in the details to be submitted by the Contractor under Sub-Clause 6.10 [Records of Contractor's Personnel and Equipment].

**6.23 Workers' Organisations**

In countries where the relevant labour laws recognise workers' rights to form and to join workers' organisations of their choosing without interference and to bargain collectively, the Contractor shall comply with such laws. Where the relevant labour laws substantially restrict workers' organisations, the Contractor shall enable alternative means for the Contractor's Personnel to express their grievances and protect their rights regarding working conditions and terms of employment. In either case described above, and where the relevant labour laws are silent, the Contractor shall not discourage the Contractor's Personnel from forming or joining workers' organisations of their choosing or from bargaining collectively, and shall not discriminate or retaliate against the Contractor's Personnel who participate, or seek to participate, in such organisations and bargain collectively. The Contractor shall engage with such workers' representatives. Workers' organisations are expected to fairly represent the workers in the workforce.



Corsan Corviam Construccion S.A.  
Contractor

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

**6.24 Non-Discrimination and Equal Opportunity**

The Contractor shall not make employment decisions on the basis of personal characteristics unrelated to inherent job requirements. The Contractor shall base the employment relationship on the principle of equal opportunity and fair treatment, and shall not discriminate with respect to aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, promotion, termination of employment or retirement, and discipline. In countries where the relevant labour laws provide for non discrimination in employment, the Contractor shall comply with such laws. When the relevant labour laws are silent on nondiscrimination in employment, the Contractor shall meet this Sub-Clause's requirements. Special measures of protection or assistance to remedy past discrimination or selection for a particular job based on the inherent requirements of the job shall not be deemed discrimination.

**7. Plant, Materials and Workmanship**

**7.1 Manner of Execution**

The Contractor shall carry out the manufacture of Plant, the production and manufacture of Materials, and all other execution of the Works:

- (a) in the manner (if any) specified in the Contract,
- (b) in a proper workmanlike and careful manner, in accordance with recognised good practice, and
- (c) with properly equipped facilities and non-hazardous Materials, except as otherwise specified in the Contract.

**7.2 Samples**

The Contractor shall submit the following samples of Materials, and relevant information, to the Engineer for consent prior to using the Materials in or for the Works:

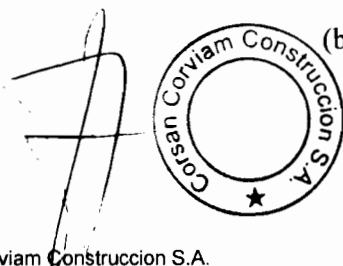
- (a) manufacturer's standard samples of Materials and samples specified in the Contract, all at the Contractor's cost, and
- (b) additional samples instructed by the Engineer as a Variation.

Each sample shall be labelled as to origin and intended use in the Works.

**7.3 Inspection**

The Employer's Personnel shall at all reasonable times:

- (a) have full access to all parts of the Site and to all places from which natural Materials are being obtained, and
- (b) during production, manufacture and construction (at the



Site and elsewhere), be entitled to examine, inspect, measure and test the materials and workmanship, and to check the progress of manufacture of Plant and production and manufacture of Materials.

The Contractor shall give the Employer's Personnel full opportunity to carry out these activities, including providing access, facilities, permissions and safety equipment. No such activity shall relieve the Contractor from any obligation or responsibility.

The Contractor shall give notice to the Engineer whenever any work is ready and before it is covered up, put out of sight, or packaged for storage or transport. The Engineer shall then either carry out the examination, inspection, measurement or testing without unreasonable delay, or promptly give notice to the Contractor that the Engineer does not require to do so. If the Contractor fails to give the notice, he shall, if and when required by the Engineer, uncover the work and thereafter reinstate and make good, all at the Contractor's cost.

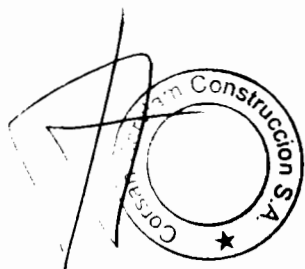
#### 7.4 Testing

This Sub-Clause shall apply to all tests specified in the Contract, other than the Tests after Completion (if any).

Except as otherwise specified in the Contract, the Contractor shall provide all apparatus, assistance, documents and other information, electricity, equipment, fuel, consumables, instruments, labour, materials, and suitably qualified and experienced staff, as are necessary to carry out the specified tests efficiently. The Contractor shall agree, with the Engineer, the time and place for the specified testing of any Plant, Materials and other parts of the Works.

The Engineer may, under Clause 13 [Variations and Adjustments], vary the location or details of specified tests, or instruct the Contractor to carry out additional tests. If these varied or additional tests show that the tested Plant, Materials or workmanship is not in accordance with the Contract, the cost of carrying out this Variation shall be borne by the Contractor, notwithstanding other provisions of the Contract.

The Engineer shall give the Contractor not less than 24 hours' notice of the Engineer's intention to attend the tests. If the Engineer does not attend at the time and place agreed, the Contractor may proceed with the tests, unless otherwise instructed by the Engineer, and the tests shall then be deemed to have been made in the Engineer's presence.



Corsan Corviam Construcción S.A.  
Contractor

Handwritten signature and circular stamp of the Chief Engineer. The stamp contains the text: Chief Engineer, World Bank Projects, Odisha, O/o the E.I.C. (Civil), Odisha, Bhubaneswar.



If the Contractor suffers delay and/or incurs Cost from complying with these instructions or as a result of a delay for which the Employer is responsible, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

- (a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
- (b) payment of any such Cost plus profit, which shall be included in the Contract Price.

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

The Contractor shall promptly forward to the Engineer duly certified reports of the tests. When the specified tests have been passed, the Engineer shall endorse the Contractor's test certificate, or issue a certificate to him, to that effect. If the Engineer has not attended the tests, he shall be deemed to have accepted the readings as accurate.

## 7.5 Rejection

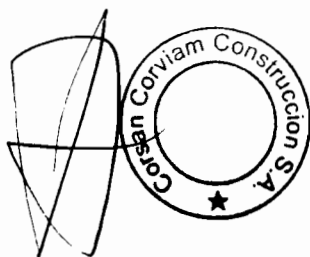
If, as a result of an examination, inspection, measurement or testing, any Plant, Materials or workmanship is found to be defective or otherwise not in accordance with the Contract, the Engineer may reject the Plant, Materials or workmanship by giving notice to the Contractor, with reasons. The Contractor shall then promptly make good the defect and ensure that the rejected item complies with the Contract.

If the Engineer requires this Plant, Materials or workmanship to be retested, the tests shall be repeated under the same terms and conditions. If the rejection and retesting cause the Employer to incur additional costs, the Contractor shall subject to Sub-Clause 2.5 [Employer's Claims] pay these costs to the Employer.

## 7.6 Remedial Work

Notwithstanding any previous test or certification, the Engineer may instruct the Contractor to:

- (a) remove from the Site and replace any Plant or Materials which is not in accordance with the Contract,
- (b) remove and re-execute any other work which is not in accordance with the Contract, and
- (c) execute any work which is urgently required for the safety



of the Works, whether because of an accident, unforeseeable event or otherwise.

The Contractor shall comply with the instruction within a reasonable time, which shall be the time (if any) specified in the instruction, or immediately if urgency is specified under subparagraph (c).

If the Contractor fails to comply with the instruction, the Employer shall be entitled to employ and pay other persons to carry out the work. Except to the extent that the Contractor would have been entitled to payment for the work, the Contractor shall subject to Sub-Clause 2.5 [Employer's Claims] pay to the Employer all costs arising from this failure.

#### **7.7 Ownership of Plant and Materials**

Except otherwise specified in the Contract, each item of Plant and Materials shall, to the extent consistent with the Laws of the Country, become the property of the Employer at whichever is the earlier of the following times, free from liens and other encumbrances:

- (a) when it is incorporated in the Works;
- (b) when the Contractor is paid the corresponding value of the Plant and Materials under Sub-Clause 8.10 [Payment for Plant and Materials in Event of Suspension].

#### **7.8 Royalties**

Unless otherwise stated in the Specification, the Contractor shall pay all royalties, rents and other payments for:

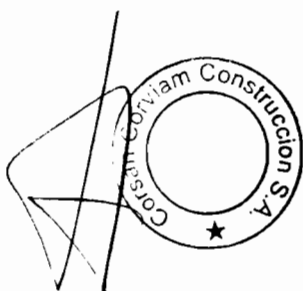
- (a) natural Materials obtained from outside the Site, and
- (b) the disposal of material from demolitions and excavations and of other surplus material (whether natural or man-made), except to the extent that disposal areas within the Site are specified in the Contract.

### **8. Commencement, Delays and Suspension**

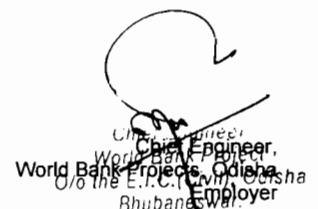
#### **8.1 Commencement of Works**

Except otherwise specified in the Particular Conditions, the Commencement Date shall be the date at which the following precedent conditions have all been fulfilled and the Engineer's instruction recording the agreement of both Parties on such fulfilment and instructing to commence the Works is received by the Contractor:

- (a) signature of the Contract Agreement by both Parties, and if required, approval of the Contract by relevant



Corsan Corviam Construcción S.A.  
Contractor



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

authorities in the Country;

- (b) delivery to the Contractor of reasonable evidence of the Employer's Financial arrangements (under Sub-Clause 2.4 [Employer's Financial Arrangements])
- (c) except if otherwise specified in the Contract Data, possession of the Site given to the Contractor together with such permission(s) under (a) of Sub-Clause 1.13 [Compliance with Laws] as required for the commencement of the Works; and
- (d) receipt by the Contractor of the Advance Payment under Sub-Clause 14.2 [Advance Payment] provided that the corresponding bank guarantee has been delivered by the Contractor.
- (e) If the said Engineer's instruction is not received by the Contractor within 180 days from his receipt of the Letter of Acceptance, the Contractor shall be entitled to terminate the Contract under Sub-Clause 16.2 [Termination by Contractor].

The Contractor shall commence the execution of the Works as soon as is reasonably practicable after the Commencement Date, and shall then proceed with the Works with due expedition and without delay.

## 8.2 Time for Completion

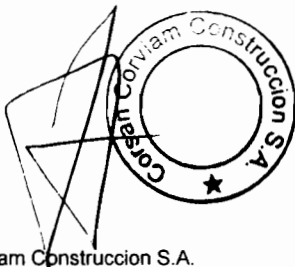
The Contractor shall complete the whole of the Works, and each Section (if any), within the Time for Completion for the Works or Section (as the case may be), including:

- (a) achieving the passing of the Tests on Completion, and
- (b) completing all work which is stated in the Contract as being required for the Works or Section to be considered to be completed for the purposes of taking-over under Sub-Clause 10.1 [Taking Over of the Works and Sections].

## 8.3 Programme

The Contractor shall submit a detailed time programme to the Engineer within 28 days after receiving the notice under Sub-Clause 8.1 [Commencement of Works]. The Contractor shall also submit a revised programme whenever the previous programme is inconsistent with actual progress or with the Contractor's obligations. Each programme shall include:

- (a) the order in which the Contractor intends to carry out the Works, including the anticipated timing of each stage of



design (if any), Contractor's Documents, procurement, manufacture of Plant, delivery to Site, construction, erection and testing,

- (b) each of these stages for work by each nominated Subcontractor (as defined in Clause 5 [Nominated Subcontractors]),
- (c) the sequence and timing of inspections and tests specified in the Contract, and
- (d) a supporting report which includes:
  - (i) a general description of the methods which the Contractor intends to adopt, and of the major stages, in the execution of the Works, and
  - (ii) details showing the Contractor's reasonable estimate of the number of each class of Contractor's Personnel and of each type of Contractor's Equipment, required on the Site for each major stage.

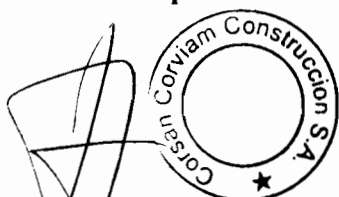
Unless the Engineer, within 21 days after receiving a programme, gives notice to the Contractor stating the extent to which it does not comply with the Contract, the Contractor shall proceed in accordance with the programme, subject to his other obligations under the Contract. The Employer's Personnel shall be entitled to rely upon the programme when planning their activities.

The Contractor shall promptly give notice to the Engineer of specific probable future events or circumstances which may adversely affect the work, increase the Contract Price, or delay the execution of the Works. The Engineer may require the Contractor to submit an estimate of the anticipated effect of the future event or circumstances, and/or a proposal under Sub-Clause 13.3 [Variation Procedure].

If, at any time, the Engineer gives notice to the Contractor that a programme fails (to the extent stated) to comply with the Contract or to be consistent with actual progress and the Contractor's stated intentions, the Contractor shall submit a revised programme to the Engineer in accordance with this Sub-Clause.

#### 8.4 Extension of Time for Completion

The Contractor shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to an extension of the Time for Completion if and to the extent that completion for the purposes of Sub-Clause 10.1 [Taking-Over of the Works and Sections] is



or will be delayed by any of the following causes:

- (a) a Variation (unless an adjustment to the Time for Completion has been agreed under Sub-Clause 13.3 [Variation Procedure]) or other substantial change in the quantity of an item of work included in the Contract,
- (b) a cause of delay giving an entitlement to extension of time under a Sub-Clause of these Conditions,
- (c) exceptionally adverse climatic conditions,
- (d) Unforeseeable shortages in the availability of personnel or Goods caused by epidemic or governmental actions, or
- (e) any delay, impediment or prevention caused by or attributable to the Employer, the Employer's Personnel, or the Employer's other contractors.

If the Contractor considers himself to be entitled to an extension of the Time for Completion, the Contractor shall give notice to the Engineer in accordance with Sub-Clause 20.1 [Contractor's Claims]. When determining each extension of time under Sub-Clause 20.1, the Engineer shall review previous determinations and may increase, but shall not decrease, the total extension of time.

#### 8.5 Delays Caused by Authorities

If the following conditions apply, namely:

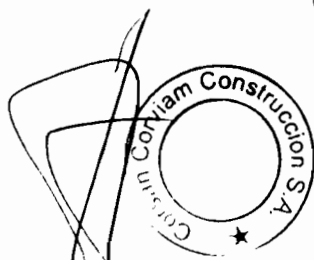
- (a) the Contractor has diligently followed the procedures laid down by the relevant legally constituted public authorities in the Country,
- (b) these authorities delay or disrupt the Contractor's work, and
- (c) the delay or disruption was Unforeseeable,

then this delay or disruption will be considered as a cause of delay under sub-paragraph (b) of Sub-Clause 8.4 [Extension of Time for Completion].

#### 8.6 Rate of Progress

If, at any time:

- (a) actual progress is too slow to complete within the Time for Completion, and/or
- (b) progress has fallen (or will fall) behind the current programme under Sub-Clause 8.3 [Programme],



other than as a result of a cause listed in Sub-Clause 8.4 [Extension of Time for Completion], then the Engineer may instruct the Contractor to submit, under Sub-Clause 8.3 [Programme], a revised programme and supporting report describing the revised methods which the Contractor proposes to adopt in order to expedite progress and complete within the Time for Completion.

Unless the Engineer notifies otherwise, the Contractor shall adopt these revised methods, which may require increases in the working hours and/or in the numbers of Contractor's Personnel and/or Goods, at the risk and cost of the Contractor. If these revised methods cause the Employer to incur additional costs, the Contractor shall subject to notice under Sub-Clause 2.5 [Employer's Claims] pay these costs to the Employer, in addition to delay damages (if any) under Sub-Clause 8.7 [Delay Damages] below.

Additional costs of revised methods, including acceleration measures, instructed by the Engineer to reduce delays resulting from causes listed under Sub-Clause 8.4 [Extension of Time for Completion] shall be paid by the Employer, without generating, however, any other additional payment benefit to the Contractor.

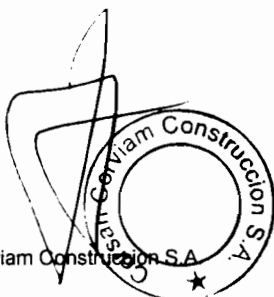
### 8.7 Delay Damages

If the Contractor fails to comply with Sub-Clause 8.2 [Time for Completion], the Contractor shall be subject to notice under Sub-Clause 2.5 [Employer's Claims] pay delay damages to the Employer for this default. These delay damages shall be the sum stated in the Contract Data, which shall be paid for every day which shall elapse between the relevant Time for Completion and the date stated in the Taking-Over Certificate. However, the total amount due under this Sub-Clause shall not exceed the maximum amount of delay damages (if any) stated in the Contract Data.

These delay damages shall be the only damages due from the Contractor for such default, other than in the event of termination under Sub-Clause 15.2 [Termination by Employer] prior to completion of the Works. These damages shall not relieve the Contractor from his obligation to complete the Works, or from any other duties, obligations or responsibilities which he may have under the Contract.

### 8.8 Suspension of Work

The Engineer may at any time instruct the Contractor to suspend progress of part or all of the Works. During such suspension, the Contractor shall protect, store and secure such part or the Works against any deterioration, loss or damage.



The Engineer may also notify the cause for the suspension. If and to the extent that the cause is notified and is the responsibility of the Contractor, the following Sub-Clauses 8.9 [Consequences of Suspension], 8.10 [Payment for Plant and Materials in Event of Suspension] and 8.11 [Prolonged Suspension] shall not apply.

#### **8.9 Consequences of Suspension**

If the Contractor suffers delay and/or incurs Cost from complying with the Engineer's instructions under Sub-Clause 8.8 [Suspension of Work] and/or from resuming the work, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

- (a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
- (b) payment of any such Cost, which shall be included in the Contract Price.

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

The Contractor shall not be entitled to an extension of time for, or to payment of the Cost incurred in, making good the consequences of the Contractor's faulty design, workmanship or materials, or of the Contractor's failure to protect, store or secure in accordance with Sub-Clause 8.8 [Suspension of Work].

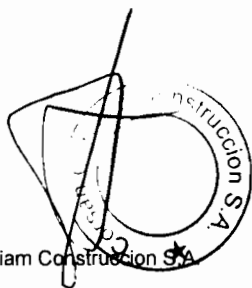
#### **8.10 Payment for Plant and Materials in Event of Suspension**

The Contractor shall be entitled to payment of the value (as at the date of suspension) of Plant and/or Materials which have not been delivered to Site, if:

- (a) the work on Plant or delivery of Plant and/or Materials has been suspended for more than 28 days, and
- (b) the Contractor has marked the Plant and/or Materials as the Employer's property in accordance with the Engineer's instructions.

#### **8.11 Prolonged Suspension**

If the suspension under Sub-Clause 8.8 [Suspension of Work] has continued for more than 84 days, the Contractor may request the Engineer's permission to proceed. If the Engineer does not give permission within 28 days after being requested to do so, the Contractor may, by giving notice to the Engineer, treat the suspension as an omission under Clause 13 [Variations and



Adjustments] of the affected part of the Works. If the suspension affects the whole of the Works, the Contractor may give notice of termination under Sub-Clause 16.2 [Termination by Contractor].

## 8.12 Resumption of Work

After the permission or instruction to proceed is given, the Contractor and the Engineer shall jointly examine the Works and the Plant and Materials affected by the suspension. The Contractor shall make good any deterioration or defect in or loss of the Works or Plant or Materials, which has occurred during the suspension after receiving from the Engineer an instruction to this effect under Clause 13 [Variations and Adjustments].

## 9. Tests on Completion

### 9.1 Contractor's Obligations

The Contractor shall carry out the Tests on Completion in accordance with this Clause and Sub-Clause 7.4 [Testing], after providing the documents in accordance with sub-paragraph (d) of Sub-Clause 4.1 [Contractor's General Obligations].

The Contractor shall give to the Engineer not less than 21 days' notice of the date after which the Contractor will be ready to carry out each of the Tests on Completion. Unless otherwise agreed, Tests on Completion shall be carried out within 14 days after this date, on such day or days as the Engineer shall instruct.

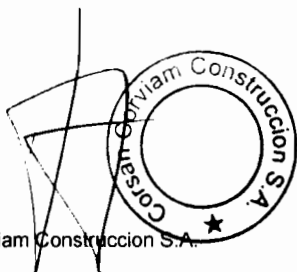
In considering the results of the Tests on Completion, the Engineer shall make allowances for the effect of any use of the Works by the Employer on the performance or other characteristics of the Works. As soon as the Works, or a Section, have passed any Tests on Completion, the Contractor shall submit a certified report of the results of these Tests to the Engineer.

### 9.2 Delayed Tests

If the Tests on Completion are being unduly delayed by the Employer, Sub-Clause 7.4 [Testing] (fifth paragraph) and/or Sub-Clause 10.3 [Interference with Tests on Completion] shall be applicable.

If the Tests on Completion are being unduly delayed by the Contractor, the Engineer may by notice require the Contractor to carry out the Tests within 21 days after receiving the notice. The Contractor shall carry out the Tests on such day or days within that period as the Contractor may fix and of which he shall give notice to the Engineer.

If the Contractor fails to carry out the Tests on Completion within the period of 21 days, the Employer's Personnel may





proceed with the Tests at the risk and cost of the Contractor. The Tests on Completion shall then be deemed to have been carried out in the presence of the Contractor and the results of the Tests shall be accepted as accurate.

### 9.3 Retesting

If the Works, or a Section, fail to pass the Tests on Completion, Sub-Clause 7.5 [Rejection] shall apply, and the Engineer or the Contractor may require the failed Tests, and Tests on Completion on any related work, to be repeated under the same terms and conditions.

### 9.4 Failure to Pass Tests on Completion

If the Works, or a Section, fail to pass the Tests on Completion repeated under Sub-Clause 9.3 [Retesting], the Engineer shall be entitled to:

- (a) order further repetition of Tests on Completion under Sub-Clause 9.3;
- (b) if the failure deprives the Employer of substantially the whole benefit of the Works or Section, reject the Works or Section (as the case may be), in which event the Employer shall have the same remedies as are provided in sub-paragraph (c) of Sub-Clause 11.4 [Failure to Remedy Defects]; or
- (c) issue a Taking-Over Certificate, if the Employer so requests.

In the event of sub-paragraph (c), the Contractor shall proceed in accordance with all other obligations under the Contract, and the Contract Price shall be reduced by such amount as shall be appropriate to cover the reduced value to the Employer as a result of this failure. Unless the relevant reduction for this failure is stated (or its method of calculation is defined) in the Contract, the Employer may require the reduction to be (i) agreed by both Parties (in full satisfaction of this failure only) and paid before this Taking-Over Certificate is issued, or (ii) determined and paid under Sub-Clause 2.5 [Employer's Claims] and Sub-Clause 3.5 [Determinations].

## 10. Employer's Taking Over

### 10.1 Taking Over of the Works and Sections

Except as stated in Sub-Clause 9.4 [Failure to Pass Tests on Completion], the Works shall be taken over by the Employer when (i) the Works have been completed in accordance with the Contract, including the matters described in Sub-Clause 8.2 [Time for Completion] and except as allowed in sub-paragraph (a) below, and (ii) a Taking-Over Certificate for the Works has been issued, or is deemed to have been issued in accordance

with this Sub-Clause.

The Contractor may apply by notice to the Engineer for a Taking-Over Certificate not earlier than 14 days before the Works will, in the Contractor's opinion, be complete and ready for taking over. If the Works are divided into Sections, the Contractor may similarly apply for a Taking-Over Certificate for each Section.

The Engineer shall, within 28 days after receiving the Contractor's application:

- (a) issue the Taking-Over Certificate to the Contractor, stating the date on which the Works or Section were completed in accordance with the Contract, except for any minor outstanding work and defects which will not substantially affect the use of the Works or Section for their intended purpose (either until or whilst this work is completed and these defects are remedied); or
- (b) reject the application, giving reasons and specifying the work required to be done by the Contractor to enable the Taking-Over Certificate to be issued. The Contractor shall then complete this work before issuing a further notice under this Sub-Clause.

If the Engineer fails either to issue the Taking-Over Certificate or to reject the Contractor's application within the period of 28 days, and if the Works or Section (as the case may be) are substantially in accordance with the Contract, the Taking-Over Certificate shall be deemed to have been issued on the last day of that period.

## 10.2 Taking Over of Parts of the Works

The Engineer may, at the sole discretion of the Employer, issue a Taking-Over Certificate for any part of the Permanent Works.

The Employer shall not use any part of the Works (other than as a temporary measure which is either specified in the Contract or agreed by both Parties) unless and until the Engineer has issued a Taking-Over Certificate for this part. However, if the Employer does use any part of the Works before the Taking-Over Certificate is issued:

- (a) the part which is used shall be deemed to have been taken over as from the date on which it is used,
- (b) the Contractor shall cease to be liable for the care of such part as from this date, when responsibility shall pass to the Employer, and



- (c) if requested by the Contractor, the Engineer shall issue a Taking-Over Certificate for this part.

After the Engineer has issued a Taking-Over Certificate for a part of the Works, the Contractor shall be given the earliest opportunity to take such steps as may be necessary to carry out any outstanding Tests on Completion. The Contractor shall carry out these Tests on Completion as soon as practicable before the expiry date of the relevant Defects Notification Period.

If the Contractor incurs Cost as a result of the Employer taking over and/or using a part of the Works, other than such use as is specified in the Contract or agreed by the Contractor, the Contractor shall (i) give notice to the Engineer and (ii) be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to payment of any such Cost plus profit, which shall be included in the Contract Price. After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine this Cost and profit.

If a Taking-Over Certificate has been issued for a part of the Works (other than a Section), the delay damages thereafter for completion of the remainder of the Works shall be reduced. Similarly, the delay damages for the remainder of the Section (if any) in which this part is included shall also be reduced. For any period of delay after the date stated in this Taking-Over Certificate, the proportional reduction in these delay damages shall be calculated as the proportion which the value of the part so certified bears to the value of the Works or Section (as the case may be) as a whole. The Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these proportions. The provisions of this paragraph shall only apply to the daily rate of delay damages under Sub-Clause 8.7 [Delay Damages], and shall not affect the maximum amount of these damages.

### 10.3 Interference with Tests on Completion

If the Contractor is prevented, for more than 14 days, from carrying out the Tests on Completion by a cause for which the Employer is responsible, the Employer shall be deemed to have taken over the Works or Section (as the case may be) on the date when the Tests on Completion would otherwise have been completed.

The Engineer shall then issue a Taking-Over Certificate accordingly, and the Contractor shall carry out the Tests on Completion as soon as practicable, before the expiry date of the Defects Notification Period. The Engineer shall require the

Tests on Completion to be carried out by giving 14 days' notice and in accordance with the relevant provisions of the Contract.

If the Contractor suffers delay and/or incurs Cost as a result of this delay in carrying out the Tests on Completion, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

- (a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
- (b) payment of any such Cost plus profit, which shall be included in the Contract Price.

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

#### 10.4 Surfaces Requiring Reinstatement

Except as otherwise stated in a Taking-Over Certificate, a certificate for a Section or part of the Works shall not be deemed to certify completion of any ground or other surfaces requiring reinstatement.

### 11. Defects Liability

#### 11.1 Completion of Outstanding Work and Remediating Defects

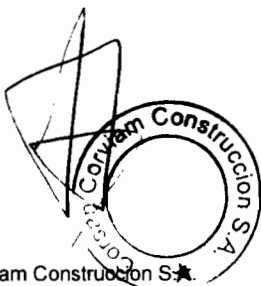
In order that the Works and Contractor's Documents, and each Section, shall be in the condition required by the Contract (fair wear and tear excepted) by the expiry date of the relevant Defects Notification Period or as soon as practicable thereafter, the Contractor shall:

- (a) complete any work which is outstanding on the date stated in a Taking-Over Certificate, within such reasonable time as is instructed by the Engineer, and
- (b) execute all work required to remedy defects or damage, as may be notified by (or on behalf of) the Employer on or before the expiry date of the Defects Notification Period for the Works or Section (as the case may be).

If a defect appears or damage occurs, the Contractor shall be notified accordingly, by (or on behalf of) the Employer.

#### 11.2 Cost of Remediating Defects

All work referred to in sub-paragraph (b) of Sub-Clause 11.1 [Completion of Outstanding Work and Remediating Defects] shall be executed at the risk and cost of the Contractor, if and to the extent that the work is attributable to:



- (a) any design for which the Contractor is responsible,
- (b) Plant, Materials or workmanship not being in accordance with the Contract, or
- (c) failure by the Contractor to comply with any other obligation.

If and to the extent that such work is attributable to any other cause, the Contractor shall be notified promptly by (or on behalf of) the Employer and Sub-Clause 13.3 [Variation Procedure] shall apply.

### 11.3 Extension of Defects Notification Period

The Employer shall be entitled subject to Sub-Clause 2.5 [Employer's Claims] to an extension of the Defects Notification Period for the Works or a Section if and to the extent that the Works, Section or a major item of Plant (as the case may be, and after taking over) cannot be used for the purposes for which they are intended by reason of a defect or by reason of a damage attributable to the Contractor. However, a Defects Notification Period shall not be extended by more than two years.

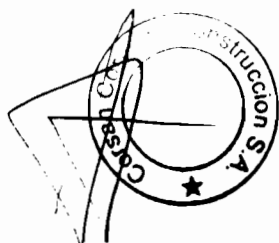
If delivery and/or erection of Plant and/or Materials was suspended under Sub-Clause 8.8 [Suspension of Work] or Sub-Clause 16.1 [Contractor's Entitlement to Suspend Work], the Contractor's obligations under this Clause shall not apply to any defects or damage occurring more than two years after the Defects Notification Period for the Plant and/or Materials would otherwise have expired.

### 11.4 Failure to Remedy Defects

If the Contractor fails to remedy any defect or damage within a reasonable time, a date may be fixed by (or on behalf of) the Employer, on or by which the defect or damage is to be remedied. The Contractor shall be given reasonable notice of this date.

If the Contractor fails to remedy the defect or damage by this notified date and this remedial work was to be executed at the cost of the Contractor under Sub-Clause 11.2 [Cost of Remedying Defects], the Employer may (at his option):

- (a) carry out the work himself or by others, in a reasonable manner and at the Contractor's cost, but the Contractor shall have no responsibility for this work; and the Contractor shall subject to Sub-Clause 2.5 [Employer's Claims] pay to the Employer the costs reasonably incurred by the Employer in remedying the defect or damage;
- (b) require the Engineer to agree or determine a reasonable



reduction in the Contract Price in accordance with Sub-Clause 3.5 [Determinations]; or

- (c) if the defect or damage deprives the Employer of substantially the whole benefit of the Works or any major part of the Works, terminate the Contract as a whole, or in respect of such major part which cannot be put to the intended use. Without prejudice to any other rights, under the Contract or otherwise, the Employer shall then be entitled to recover all sums paid for the Works or for such part (as the case may be), plus financing costs and the cost of dismantling the same, clearing the Site and returning Plant and Materials to the Contractor.

#### 11.5 Removal of Defective Work

If the defect or damage cannot be remedied expeditiously on the Site and the Employer gives consent, the Contractor may remove from the Site for the purposes of repair such items of Plant as are defective or damaged. This consent may require the Contractor to increase the amount of the Performance Security by the full replacement cost of these items, or to provide other appropriate security.

#### 11.6 Further Tests

If the work of remedying of any defect or damage may affect the performance of the Works, the Engineer may require the repetition of any of the tests described in the Contract. The requirement shall be made by notice within 28 days after the defect or damage is remedied.

These tests shall be carried out in accordance with the terms applicable to the previous tests, except that they shall be carried out at the risk and cost of the Party liable, under Sub-Clause 11.2 [Cost of Remedying Defects], for the cost of the remedial work.

#### 11.7 Right of Access

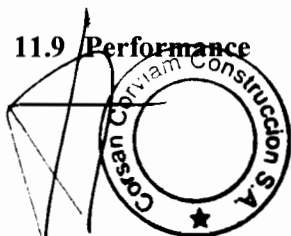
Until the Performance Certificate has been issued, the Contractor shall have such right of access to the Works as is reasonably required in order to comply with this Clause, except as may be inconsistent with the Employer's reasonable security restrictions.

#### 11.8 Contractor to Search

The Contractor shall, if required by the Engineer, search for the cause of any defect, under the direction of the Engineer. Unless the defect is to be remedied at the cost of the Contractor under Sub-Clause 11.2 [Cost of Remedying Defects], the Cost of the search plus profit shall be agreed or determined by the Engineer in accordance with Sub-Clause 3.5 [Determinations] and shall be included in the Contract Price.

#### 11.9 Performance

Performance of the Contractor's obligations shall not be



**Certificate**

considered to have been completed until the Engineer has issued the Performance Certificate to the Contractor, stating the date on which the Contractor completed his obligations under the Contract.

The Engineer shall issue the Performance Certificate within 28 days after the latest of the expiry dates of the Defects Notification Periods, or as soon thereafter as the Contractor has supplied all the Contractor's Documents and completed and tested all the Works, including remedying any defects. A copy of the Performance Certificate shall be issued to the Employer.

Only the Performance Certificate shall be deemed to constitute acceptance of the Works.

**11.10 Unfulfilled Obligations**

After the Performance Certificate has been issued, each Party shall remain liable for the fulfilment of any obligation which remains unperformed at that time. For the purposes of determining the nature and extent of unperformed obligations, the Contract shall be deemed to remain in force.

**11.11 Clearance of Site**

Upon receiving the Performance Certificate, the Contractor shall remove any remaining Contractor's Equipment, surplus material, wreckage, rubbish and Temporary Works from the Site.

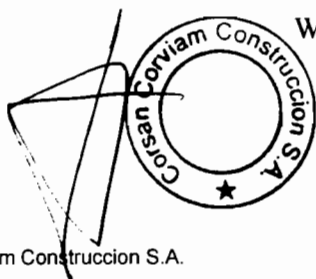
If all these items have not been removed within 28 days after receipt by the Contractor of the Performance Certificate, the Employer may sell or otherwise dispose of any remaining items. The Employer shall be entitled to be paid the costs incurred in connection with, or attributable to, such sale or disposal and restoring the Site.

Any balance of the moneys from the sale shall be paid to the Contractor. If these moneys are less than the Employer's costs, the Contractor shall pay the outstanding balance to the Employer.

**12. Measurement and Evaluation****12.1 Works to be Measured**

The Works shall be measured, and valued for payment, in accordance with this Clause. The Contractor shall show in each application under Sub-Clauses 14.3 [Application for Interim Payment Certificates], 14.10 [Statement at Completion], and 14.11 [Application for Final Payment Certificate] the quantities and other particulars detailing the amounts which he considers to be entitled under the Contract.

Whenever the Engineer requires any part of the Works to be



measured, reasonable notice shall be given to the Contractor's Representative, who shall:

- (a) promptly either attend or send another qualified representative to assist the Engineer in making the measurement, and
- (b) supply any particulars requested by the Engineer.

If the Contractor fails to attend or send a representative, the measurement made by (or on behalf of) the Engineer shall be accepted as accurate.

Except as otherwise stated in the Contract, wherever any Permanent Works are to be measured from records, these shall be prepared by the Engineer. The Contractor shall, as and when requested, attend to examine and agree the records with the Engineer, and shall sign the same when agreed. If the Contractor does not attend, the records shall be accepted as accurate.

If the Contractor examines and disagrees the records, and/or does not sign them as agreed, then the Contractor shall give notice to the Engineer of the respects in which the records are asserted to be inaccurate. After receiving this notice, the Engineer shall review the records and either confirm or vary them and certify the payment of the undisputed part. If the Contractor does not so give notice to the Engineer within 14 days after being requested to examine the records, they shall be accepted as accurate.

## 12.2 Method of Measurement

Except as otherwise stated in the Contract and notwithstanding local practice:

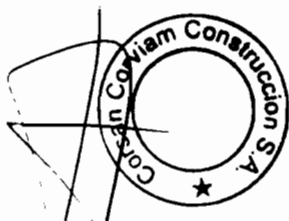
measurement shall be made of the net actual quantity of each item of the Permanent Works, and

the method of measurement shall be in accordance with the Bill of Quantities or other applicable Schedules.

## 12.3 Evaluation

Except as otherwise stated in the Contract, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine the Contract Price by evaluating each item of work, applying the measurement agreed or determined in accordance with the above Sub-Clauses 12.1 [Works to be Measured] and 12.2 [Method of Measurement] and the appropriate rate or price for the item.

For each item of work, the appropriate rate or price for the item shall be the rate or price specified for such item in the Contract





or, if there is no such item, specified for similar work.

Any item of work included in the Bill of Quantities for which no rate or price was specified shall be considered as included in other rates and prices in the Bill of Quantities and will not be paid for separately.

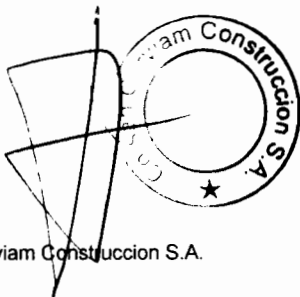
However, a new rate or price shall be appropriate for an item of work if:

- (a)
- (i) the measured quantity of the item is changed by more than 25% from the quantity of this item in the Bill of Quantities or other Schedule,
  - (ii) this change in quantity multiplied by such specified rate for this item exceeds 0.25% of the Accepted Contract Amount,
  - (iii) this change in quantity directly changes the Cost per unit quantity of this item by more than 1%, and
  - (iv) this item is not specified in the Contract as a "fixed rate item";

or

- (b)
- (i) the work is instructed under Clause 13 [Variations and Adjustments],
  - (ii) no rate or price is specified in the Contract for this item, and
  - (iii) no specified rate or price is appropriate because the item of work is not of similar character, or is not executed under similar conditions, as any item in the Contract.

Each new rate or price shall be derived from any relevant rates or prices in the Contract, with reasonable adjustments to take account of the matters described in sub-paragraph (a) and/or (b), as applicable. If no rates or prices are relevant for the derivation of a new rate or price, it shall be derived from the reasonable Cost of executing the work, together with profit, taking account of any other relevant matters.



Until such time as an appropriate rate or price is agreed or determined, the Engineer shall determine a provisional rate or price for the purposes of Interim Payment Certificates as soon as the concerned Works commences.

#### 12.4 Omissions

Whenever the omission of any work forms part (or all) of a Variation, the value of which has not been agreed, if:

- (a) the Contractor will incur (or has incurred) cost which, if the work had not been omitted, would have been deemed to be covered by a sum forming part of the Accepted Contract Amount;
- (b) the omission of the work will result (or has resulted) in this sum not forming part of the Contract Price; and
- (c) this cost is not deemed to be included in the evaluation of any substituted work;

then the Contractor shall give notice to the Engineer accordingly, with supporting particulars. Upon receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine this cost, which shall be included in the Contract Price.

### 13. Variations and Adjustments

#### 13.1 Right to Vary

Variations may be initiated by the Engineer at any time prior to issuing the Taking-Over Certificate for the Works, either by an instruction or by a request for the Contractor to submit a proposal.

The Contractor shall execute and be bound by each Variation, unless the Contractor promptly gives notice to the Engineer stating (with supporting particulars) that (i) the Contractor cannot readily obtain the Goods required for the Variation, or (ii) such Variation triggers a substantial change in the sequence or progress of the Works. Upon receiving this notice, the Engineer shall cancel, confirm or vary the instruction.

Each Variation may include:

- (a) changes to the quantities of any item of work included in the Contract (however, such changes do not necessarily constitute a Variation),
- (b) changes to the quality and other characteristics of any item of work,
- (c) changes to the levels, positions and/or dimensions of any

part of the Works,

- (d) omission of any work unless it is to be carried out by others,
- (e) any additional work, Plant, Materials or services necessary for the Permanent Works, including any associated Tests on Completion, boreholes and other testing and exploratory work, or
- (f) changes to the sequence or timing of the execution of the Works.

The Contractor shall not make any alteration and/or modification of the Permanent Works, unless and until the Engineer instructs or approves a Variation.

### 13.2 Value Engineering

The Contractor may, at any time, submit to the Engineer a written proposal which (in the Contractor's opinion) will, if adopted, (i) accelerate completion, (ii) reduce the cost to the Employer of executing, maintaining or operating the Works, (iii) improve the efficiency or value to the Employer of the completed Works, or (iv) otherwise be of benefit to the Employer.

The proposal shall be prepared at the cost of the Contractor and shall include the items listed in Sub-Clause 13.3 [Variation Procedure].

If a proposal, which is approved by the Engineer, includes a change in the design of part of the Permanent Works, then unless otherwise agreed by both Parties:

- (a) the Contractor shall design this part,
- (b) sub-paragraphs (a) to (d) of Sub-Clause 4.1 [Contractor's General Obligations] shall apply, and
- (c) if this change results in a reduction in the contract value of this part, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine a fee, which shall be included in the Contract Price. This fee shall be half (50%) of the difference between the following amounts:
  - (i) such reduction in contract value, resulting from the change, excluding adjustments under Sub-Clause 13.7 [Adjustments for Changes in Legislation] and Sub-Clause 13.8 [Adjustments for Changes in Cost], and

- (ii) the reduction (if any) in the value to the Employer of the varied works, taking account of any reductions in quality, anticipated life or operational efficiencies.

However, if amount (i) is less than amount (ii), there shall not be a fee.

### 13.3 Variation Procedure

If the Engineer requests a proposal, prior to instructing a Variation, the Contractor shall respond in writing as soon as practicable, either by giving reasons why he cannot comply (if this is the case) or by submitting:

- (a) a description of the proposed work to be performed and a programme for its execution,
- (b) the Contractor's proposal for any necessary modifications to the programme according to Sub-Clause 8.3 [Programme] and to the Time for Completion, and
- (c) the Contractor's proposal for evaluation of the Variation.

The Engineer shall, as soon as practicable after receiving such proposal (under Sub-Clause 13.2 [Value Engineering] or otherwise), respond with approval, disapproval or comments. The Contractor shall not delay any work whilst awaiting a response.

Each instruction to execute a Variation, with any requirements for the recording of Costs, shall be issued by the Engineer to the Contractor, who shall acknowledge receipt.

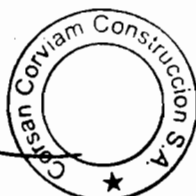
Each Variation shall be evaluated in accordance with Clause 12 [Measurement and Evaluation], unless the Engineer instructs or approves otherwise in accordance with this Clause.

### 13.4 Payment in Applicable Currencies

If the Contract provides for payment of the Contract Price in more than one currency, then whenever an adjustment is agreed, approved or determined as stated above, the amount payable in each of the applicable currencies shall be specified. For this purpose, reference shall be made to the actual or expected currency proportions of the Cost of the varied work, and to the proportions of various currencies specified for payment of the Contract Price.

### 13.5 Provisional Sums

Each Provisional Sum shall only be used, in whole or in part, in accordance with the Engineer's instructions, and the Contract Price shall be adjusted accordingly. The total sum paid to the Contractor shall include only such amounts, for the work, supplies or services to which the Provisional Sum relates, as the



Engineer shall have instructed. For each Provisional Sum, the Engineer may instruct:

- (a) work to be executed (including Plant, Materials or services to be supplied) by the Contractor and valued under Sub-Clause 13.3 [Variation Procedure]; and/or
- (b) Plant, Materials or services to be purchased by the Contractor, from a nominated Subcontractor (as defined in Clause 5 [Nominated Subcontractors]) or otherwise; and for which there shall be included in the Contract Price:
  - (i) the actual amounts paid (or due to be paid) by the Contractor, and
  - (ii) a sum for overhead charges and profit, calculated as a percentage of these actual amounts by applying the relevant percentage rate (if any) stated in the appropriate Schedule. If there is no such rate, the percentage rate stated in the Contract Data shall be applied.

The Contractor shall, when required by the Engineer, produce quotations, invoices, vouchers and accounts or receipts in substantiation.

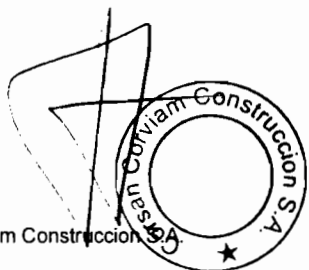
### 13.6 Daywork

For work of a minor or incidental nature, the Engineer may instruct that a Variation shall be executed on a daywork basis. The work shall then be valued in accordance with the Daywork Schedule included in the Contract, and the following procedure shall apply. If a Daywork Schedule is not included in the Contract, this Sub-Clause shall not apply.

Before ordering Goods for the work, the Contractor shall submit quotations to the Engineer. When applying for payment, the Contractor shall submit invoices, vouchers and accounts or receipts for any Goods.

Except for any items for which the Daywork Schedule specifies that payment is not due, the Contractor shall deliver each day to the Engineer accurate statements in duplicate which shall include the following details of the resources used in executing the previous day's work:

- (a) the names, occupations and time of Contractor's Personnel,
- (b) the identification, type and time of Contractor's Equipment and Temporary Works, and



(c) the quantities and types of Plant and Materials used.

One copy of each statement will, if correct, or when agreed, be signed by the Engineer and returned to the Contractor. The Contractor shall then submit priced statements of these resources to the Engineer, prior to their inclusion in the next Statement under Sub-Clause 14.3 [Application for Interim Payment Certificates].

### 13.7 Adjustments for Changes in Legislation

The Contract Price shall be adjusted to take account of any increase or decrease in Cost resulting from a change in the Laws of the Country (including the introduction of new Laws and the repeal or modification of existing Laws) or in the judicial or official governmental interpretation of such Laws, made after the Base Date, which affect the Contractor in the performance of obligations under the Contract.

If the Contractor suffers (or will suffer) delay and/or incurs (or will incur) additional Cost as a result of these changes in the Laws or in such interpretations, made after the Base Date, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

- (a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
- (b) payment of any such Cost, which shall be included in the Contract Price.

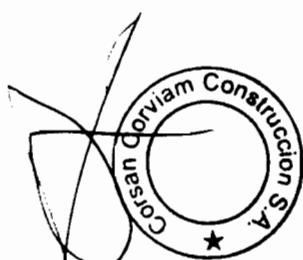
After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

Notwithstanding the foregoing, the Contractor shall not be entitled to an extension of time if the relevant delay has already been taken into account in the determination of a previous extension of time and such Cost shall not be separately paid if the same shall already have been taken into account in the indexing of any inputs to the table of adjustment data in accordance with the provisions of Sub-Clause 13.8 [Adjustments for Changes in Cost].

### 13.8 Adjustments for Changes in Cost

In this Sub-Clause, "table of adjustment data" means the completed table of adjustment data for local and foreign currencies included in the Schedules. If there is no such table of adjustment data, this Sub-Clause shall not apply.

If this Sub-Clause applies, the amounts payable to the



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Contractor

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

Contractor shall be adjusted for rises or falls in the cost of labour, Goods and other inputs to the Works, by the addition or deduction of the amounts determined by the formulae prescribed in this Sub-Clause. To the extent that full compensation for any rise or fall in Costs is not covered by the provisions of this or other Clauses, the Accepted Contract Amount shall be deemed to have included amounts to cover the contingency of other rises and falls in costs.

The adjustment to be applied to the amount otherwise payable to the Contractor, as valued in accordance with the appropriate Schedule and certified in Payment Certificates, shall be determined from formulae for each of the currencies in which the Contract Price is payable. No adjustment is to be applied to work valued on the basis of Cost or current prices. The formulae shall be of the following general type:

$P_n = a + b L_n / L_o + c E_n / E_o + d M_n / M_o + \dots$  where:

“P<sub>n</sub>” is the adjustment multiplier to be applied to the estimated contract value in the relevant currency of the work carried out in period “n”, this period being a month unless otherwise stated in the Contract Data ;

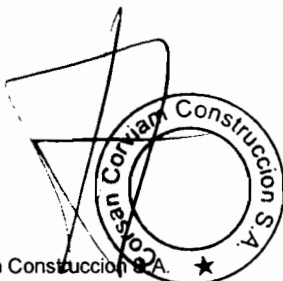
“a” is a fixed coefficient, stated in the relevant table of adjustment data, representing the non-adjustable portion in contractual payments;

“b”, “c”, “d”, ... are coefficients representing the estimated proportion of each cost element related to the execution of the Works, as stated in the relevant table of adjustment data; such tabulated cost elements may be indicative of resources such as labour, equipment and materials;

“L<sub>n</sub>”, “E<sub>n</sub>”, “M<sub>n</sub>”, ... are the current cost indices or reference prices for period “n”, expressed in the relevant currency of payment, each of which is applicable to the relevant tabulated cost element on the date 49 days prior to the last day of the period (to which the particular Payment Certificate relates); and

“L<sub>o</sub>”, “E<sub>o</sub>”, “M<sub>o</sub>”, ... are the base cost indices or reference prices, expressed in the relevant currency of payment, each of which is applicable to the relevant tabulated cost element on the Base Date.

The cost indices or reference prices stated in the table of adjustment data shall be used. If their source is in doubt, it shall be determined by the Engineer. For this purpose, reference shall be made to the values of the indices at stated dates (quoted in



the fourth and fifth columns respectively of the table) for the purposes of clarification of the source; although these dates (and thus these values) may not correspond to the base cost indices.

In cases where the "currency of index" (stated in the table) is not the relevant currency of payment, each index shall be converted into the relevant currency of payment at the selling rate, established by the central bank of the Country, of this relevant currency on the above date for which the index is required to be applicable.

Until such time as each current cost index is available, the Engineer shall determine a provisional index for the issue of Interim Payment Certificates. When a current cost index is available, the adjustment shall be recalculated accordingly.

If the Contractor fails to complete the Works within the Time for Completion, adjustment of prices thereafter shall be made using either (i) each index or price applicable on the date 49 days prior to the expiry of the Time for Completion of the Works, or (ii) the current index or price: whichever is more favourable to the Employer.

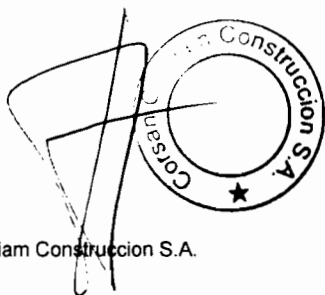
The weightings (coefficients) for each of the factors of cost stated in the table(s) of adjustment data shall only be adjusted if they have been rendered unreasonable, unbalanced or inapplicable, as a result of Variations.

## 14. Contract Price and Payment

### 14.1 The Contract Price

Unless otherwise stated in the Particular Conditions:

- (a) the Contract Price shall be agreed or determined under Sub-Clause 12.3 [Evaluation] and be subject to adjustments in accordance with the Contract;
- (b) the Contractor shall pay all taxes, duties and fees required to be paid by him under the Contract, and the Contract Price shall not be adjusted for any of these costs except as stated in Sub-Clause 13.7 [Adjustments for Changes in Legislation];
- (c) any quantities which may be set out in the Bill of Quantities or other Schedule are estimated quantities and are not to be taken as the actual and correct quantities:
  - (i) of the Works which the Contractor is required to



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Contractor

Handwritten signature and stamp of the Chief Engineer, World Bank/Project/Orissa  
World Bank Employer  
O/o the E.I.C.(Civil), Odisha  
Bhubaneswar



execute, or

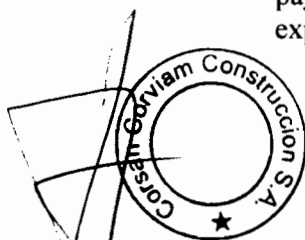
- (ii) for the purposes of Clause 12 [Measurement and Evaluation]; and
- (d) the Contractor shall submit to the Engineer, within 28 days after the Commencement Date, a proposed breakdown of each lump sum price in the Schedules. The Engineer may take account of the breakdown when preparing Payment Certificates, but shall not be bound by it.
- (e) Notwithstanding the provisions of subparagraph (b), Contractor's Equipment, including essential spare parts therefor, imported by the Contractor for the sole purpose of executing the Contract shall be exempt from the payment of import duties and taxes upon importation.

**14.2 Advance Payment** The Employer shall make an advance payment, as an interest-free loan for mobilisation and cash flow support, when the Contractor submits a guarantee in accordance with this Sub-Clause. The total advance payment, the number and timing of instalments (if more than one), and the applicable currencies and proportions, shall be as stated in the Contract Data.

Unless and until the Employer receives this guarantee, or if the total advance payment is not stated in the Contract Data, this Sub-Clause shall not apply.

The Engineer shall deliver to the Employer and to the Contractor an Interim Payment Certificate for the advance payment or its first instalment after receiving a Statement (under Sub-Clause 14.3 [Application for Interim Payment Certificates]) and after the Employer receives (i) the Performance Security in accordance with Sub-Clause 4.2 [Performance Security] and (ii) a guarantee in amounts and currencies equal to the advance payment. This guarantee shall be issued by an entity and from within a country (or other jurisdiction) approved by the Employer, and shall be in the form annexed to the Particular Conditions or in another form approved by the Employer.

The Contractor shall ensure that the guarantee is valid and enforceable until the advance payment has been repaid, but its amount shall be progressively reduced by the amount repaid by the Contractor as indicated in the Payment Certificates. If the terms of the guarantee specify its expiry date, and the advance payment has not been repaid by the date 28 days prior to the expiry date, the Contractor shall extend the validity of the



guarantee until the advance payment has been repaid.

Unless stated otherwise in the Contract Data, the advance payment shall be repaid through percentage deductions from the interim payments determined by the Engineer in accordance with Sub-Clause 14.6 [Issue of Interim Payment Certificates], as follows:.

- (a) deductions shall commence in the next interim Payment Certificate following that in which the total of all certified interim payments (excluding the advance payment and deductions and repayments of retention) exceeds 30 percent (30%) of the Accepted Contract Amount less Provisional Sums; and
- (b) deductions shall be made at the amortisation rate stated in the Contract Data of the amount of each Interim Payment Certificate (excluding the advance payment and deductions for its repayments as well as deductions for retention money) in the currencies and proportions of the advance payment until such time as the advance payment has been repaid; provided that the advance payment shall be completely repaid prior to the time when 90 per cent (90%) of the Accepted Contract Amount less Provisional Sums has been certified for payment.

If the advance payment has not been repaid prior to the issue of the Taking-Over Certificate for the Works or prior to termination under Clause 15 [Termination by Employer], Clause 16 [Suspension and Termination by Contractor] or Clause 19 [Force Majeure] (as the case may be), the whole of the balance then outstanding shall immediately become due and in case of termination under Clause 15 [Termination by Employer] and Sub-Clause 19.6 [Optional Termination, Payment and Release], payable by the Contractor to the Employer.

### 14.3 Application for Interim Payment Certificates

The Contractor shall submit a Statement in six copies to the Engineer after the end of each month, in a form approved by the Engineer, showing in detail the amounts to which the Contractor considers himself to be entitled, together with supporting documents which shall include the report on the progress during this month in accordance with Sub-Clause 4.21 [Progress Reports].

The Statement shall include the following items, as applicable, which shall be expressed in the various currencies in which the Contract Price is payable, in the sequence listed:

- (a) the estimated contract value of the Works executed and the

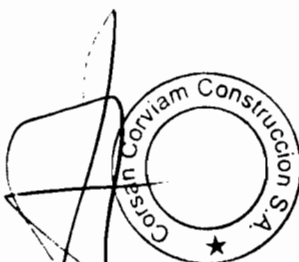
Contractor's Documents produced up to the end of the month (including Variations but excluding items described in sub-paragraphs (b) to (g) below);

- (b) any amounts to be added and deducted for changes in legislation and changes in cost, in accordance with Sub-Clause 13.7 [Adjustments for Changes in Legislation] and Sub-Clause 13.8 [Adjustments for Changes in Cost];
- (c) any amount to be deducted for retention, calculated by applying the percentage of retention stated in the Contract Data to the total of the above amounts, until the amount so retained by the Employer reaches the limit of Retention Money (if any) stated in the Contract Data;
- (d) any amounts to be added for the advance payment and (if more than one instalment) and to be deducted for its repayments in accordance with Sub-Clause 14.2 [Advance Payment];
- (e) any amounts to be added and deducted for Plant and Materials in accordance with Sub-Clause 14.5 [Plant and Materials intended for the Works];
- (f) any other additions or deductions which may have become due under the Contract or otherwise, including those under Clause 20 [Claims, Disputes and Arbitration]; and
- (g) the deduction of amounts certified in all previous Payment Certificates.

#### 14.4 Schedule of Payments

If the Contract includes a schedule of payments specifying the instalments in which the Contract Price will be paid, then unless otherwise stated in this schedule:

- (a) the instalments quoted in this schedule of payments shall be the estimated contract values for the purposes of subparagraph (a) of Sub-Clause 14.3 [Application for Interim Payment Certificates];
- (b) Sub-Clause 14.5 [Plant and Materials intended for the Works] shall not apply; and
- (c) if these instalments are not defined by reference to the actual progress achieved in executing the Works, and if actual progress is found to be less or more than that on which this schedule of payments was based, then the Engineer may proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine revised instalments, which shall take account of the extent to



which progress is less or more than that on which the instalments were previously based.

If the Contract does not include a schedule of payments, the Contractor shall submit non-binding estimates of the payments which he expects to become due during each quarterly period. The first estimate shall be submitted within 42 days after the Commencement Date. Revised estimates shall be submitted at quarterly intervals, until the Taking-Over Certificate has been issued for the Works.

**14.5 Plant and Materials intended for the Works**

If this Sub-Clause applies, Interim Payment Certificates shall include, under sub-paragraph (e) of Sub-Clause 14.3, (i) an amount for Plant and Materials which have been sent to the Site for incorporation in the Permanent Works, and (ii) a reduction when the contract value of such Plant and Materials is included as part of the Permanent Works under sub-paragraph (a) of Sub-Clause 14.3 [Application for Interim Payment Certificates].

If the lists referred to in sub-paragraphs (b)(i) or (c)(i) below are not included in the Schedules, this Sub-Clause shall not apply.

The Engineer shall determine and certify each addition if the following conditions are satisfied:

- (a) the Contractor has:
- (i) kept satisfactory records (including the orders, receipts, Costs and use of Plant and Materials) which are available for inspection, and
  - (ii) submitted a statement of the Cost of acquiring and delivering the Plant and Materials to the Site, supported by satisfactory evidence;

and either:

- (b) the relevant Plant and Materials:
- (i) are those listed in the Schedules for payment when shipped,
  - (ii) have been shipped to the Country, en route to the Site, in accordance with the Contract; and
  - (iii) are described in a clean shipped bill of lading or other evidence of shipment, which has been submitted to the Engineer together with evidence of payment of freight and insurance, any other documents reasonably required, and a bank guarantee in a form

and issued by an entity approved by the Employer in amounts and currencies equal to the amount due under this Sub-Clause: this guarantee may be in a similar form to the form referred to in Sub-Clause 14.2 [Advance Payment] and shall be valid until the Plant and Materials are properly stored on Site and protected against loss, damage or deterioration;

or

- (c) the relevant Plant and Materials:
- (i) are those listed in the Schedules for payment when delivered to the Site, and
  - (ii) have been delivered to and are properly stored on the Site, are protected against loss, damage or deterioration, and appear to be in accordance with the Contract.

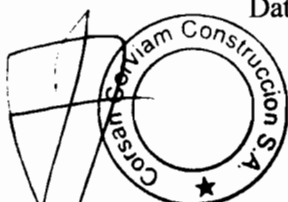
The additional amount to be certified shall be the equivalent of eighty percent of the Engineer's determination of the cost of the Plant and Materials (including delivery to Site), taking account of the documents mentioned in this Sub-Clause and of the contract value of the Plant and Materials.

The currencies for this additional amount shall be the same as those in which payment will become due when the contract value is included under sub-paragraph (a) of Sub-Clause 14.3 [Application for Interim Payment Certificates]. At that time, the Payment Certificate shall include the applicable reduction which shall be equivalent to, and in the same currencies and proportions as, this additional amount for the relevant Plant and Materials.

#### 14.6 Issue of Interim Payment Certificates

No amount will be certified or paid until the Employer has received and approved the Performance Security. Thereafter, the Engineer shall, within 28 days after receiving a Statement and supporting documents, deliver to the Employer and to the Contractor an Interim Payment Certificate which shall state the amount which the Engineer fairly determines to be due, with all supporting particulars for any reduction or withholding made by the Engineer on the Statement if any.

However, prior to issuing the Taking-Over Certificate for the Works, the Engineer shall not be bound to issue an Interim Payment Certificate in an amount which would (after retention and other deductions) be less than the minimum amount of Interim Payment Certificates (if any) stated in the Contract Data. In this event, the Engineer shall give notice to the



Contractor accordingly.

An Interim Payment Certificate shall not be withheld for any other reason, although:

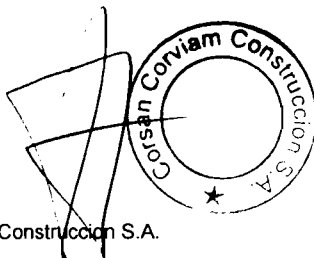
- (a) if any thing supplied or work done by the Contractor is not in accordance with the Contract, the cost of rectification or replacement may be withheld until rectification or replacement has been completed; and/or
- (b) if the Contractor was or is failing to perform any work or obligation in accordance with the Contract, and had been so notified by the Engineer, the value of this work or obligation may be withheld until the work or obligation has been performed.

The Engineer may in any Payment Certificate make any correction or modification that should properly be made to any previous Payment Certificate. A Payment Certificate shall not be deemed to indicate the Engineer's acceptance, approval, consent or satisfaction.

#### 14.7 Payment

The Employer shall pay to the Contractor:

- (a) the first instalment of the advance payment within 42 days after issuing the Letter of Acceptance or within 21 days after receiving the documents in accordance with Sub-Clause 4.2 [Performance Security] and Sub-Clause 14.2 [Advance Payment], whichever is later;
- (b) the amount certified in each Interim Payment Certificate within 56 days after the Engineer receives the Statement and supporting documents or, at a time when the Bank's loan or credit (from which part of the payments to the Contractor is being made) is suspended, the amount shown on any statement submitted by the Contractor, within 14 days after such statement is submitted, any discrepancy being rectified in the next payment to the Contractor; and
- (c) the amount certified in the Final Payment Certificate within 56 days after the Employer receives this Payment Certificate or, at a time when the Bank's loan or credit (from which part of the payments to the Contractor is being made) is suspended, the undisputed amount shown in the Final Statement, within 56 days after the date of notification of the suspension in accordance with Sub-Clause 16.2.



Corsan Corviam Construction S.A.  
Contractor

Handwritten signature of the Chief Engineer.  
Chief Engineer,  
World Bank Projects, Odisha  
Oro the E.I.C.(Civil), Odisha  
Employer  
Bhubaneswar.

Payment of the amount due in each currency shall be made into the bank account, nominated by the Contractor, in the payment country (for this currency) specified in the Contract.

**14.8 Delayed Payment** If the Contractor does not receive payment in accordance with Sub-Clause 14.7 [Payment], the Contractor shall be entitled to receive financing charges compounded monthly on the amount unpaid during the period of delay. This period shall be deemed to commence on the date for payment specified in Sub-Clause 14.7 [Payment], irrespective (in the case of its sub-paragraph (b)) of the date on which any Interim Payment Certificate is issued.

Unless otherwise stated in the Particular Conditions, these financing charges shall be calculated at the annual rate of three percentage points above the discount rate of the central bank in the country of the currency of payment, or if not available, the interbank offered rate, and shall be paid in such currency.

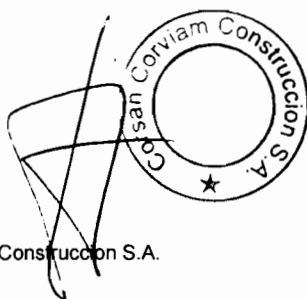
The Contractor shall be entitled to this payment without formal notice or certification, and without prejudice to any other right or remedy.

**14.9 Payment of Retention Money** When the Taking-Over Certificate has been issued for the Works, the first half of the Retention Money shall be certified by the Engineer for payment to the Contractor. If a

Taking-Over Certificate is issued for a Section or part of the Works, a proportion of the Retention Money shall be certified and paid. This proportion shall be half (50%) of the proportion calculated by dividing the estimated contract value of the Section or part, by the estimated final Contract Price.

Promptly after the latest of the expiry dates of the Defects Notification Periods, the outstanding balance of the Retention Money shall be certified by the Engineer for payment to the Contractor. If a Taking-Over Certificate was issued for a Section, a proportion of the second half of the Retention Money shall be certified and paid promptly after the expiry date of the Defects Notification Period for the Section. This proportion shall be half (50%) of the proportion calculated by dividing the estimated contract value of the Section by the estimated final Contract Price.

However, if any work remains to be executed under Clause 11 [Defects Liability], the Engineer shall be entitled to withhold certification of the estimated cost of this work until it has been



executed.

When calculating these proportions, no account shall be taken of any adjustments under Sub-Clause 13.7 [Adjustments for Changes in Legislation] and Sub-Clause 13.8 [Adjustments for Changes in Cost].

Unless otherwise stated in the Particular Conditions, when the Taking-Over Certificate has been issued for the Works and the first half of the Retention Money has been certified for payment by the Engineer, the Contractor shall be entitled to substitute a guarantee, in the form annexed to the Particular Conditions or in another form approved by the Employer and provided by an entity approved by the Employer, for the second half of the Retention Money. The Contractor shall ensure that the guarantee is in the amounts and currencies of the second half of the Retention Money and is valid and enforceable until the Contractor has executed and completed the Works and remedied any defects, as specified for the Performance Security in Sub-Clause 4.2. On receipt by the Employer of the required guarantee, the Engineer shall certify and the Employer shall pay the second half of the Retention Money. The release of the second half of the Retention Money against a guarantee shall then be in lieu of the release under the second paragraph of this Sub-Clause. The Employer shall return the guarantee to the Contractor within 21 days after receiving a copy of the Performance Certificate.

If the Performance Security required under Sub-Clause 4.2 is in the form of a demand guarantee, and the amount guaranteed under it when the Taking-Over Certificate is issued is more than half of the Retention Money, then the Retention Money guarantee will not be required. If the amount guaranteed under the Performance Security when the Taking-Over Certificate is issued is less than half of the Retention Money, the Retention Money guarantee will only be required for the difference between half of the Retention Money and the amount guaranteed under the Performance Security.

#### 14.10 Statement at Completion

Within 84 days after receiving the Taking-Over Certificate for the Works, the Contractor shall submit to the Engineer six copies of a Statement at completion with supporting documents, in accordance with Sub-Clause 14.3 [Application for Interim Payment Certificates], showing:

- (a) the value of all work done in accordance with the Contract up to the date stated in the Taking-Over Certificate for the



Works,

- (b) any further sums which the Contractor considers to be due, and
- (c) an estimate of any other amounts which the Contractor considers will become due to him under the Contract. Estimated amounts shall be shown separately in this Statement at completion.

The Engineer shall then certify in accordance with Sub-Clause 14.6 [Issue of Interim Payment Certificates].

#### 14.11 Application for Final Payment Certificate

Within 56 days after receiving the Performance Certificate, the Contractor shall submit, to the Engineer, six copies of a draft final statement with supporting documents showing in detail in a form approved by the Engineer:

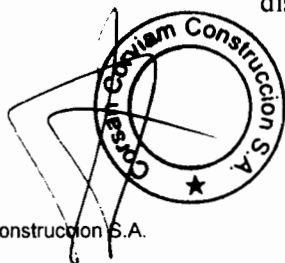
- (a) the value of all work done in accordance with the Contract, and
- (b) any further sums which the Contractor considers to be due to him under the Contract or otherwise.

If the Engineer disagrees with or cannot verify any part of the draft final statement, the Contractor shall submit such further information as the Engineer may reasonably require within 28 days from receipt of the said draft and shall make such changes in the draft as may be agreed between them. The Contractor shall then prepare and submit to the Engineer the final statement as agreed. This agreed statement is referred to in these Conditions as the "Final Statement".

However if, following discussions between the Engineer and the Contractor and any changes to the draft final statement which are agreed, it becomes evident that a dispute exists, the Engineer shall deliver to the Employer (with a copy to the Contractor) an Interim Payment Certificate for the agreed parts of the draft final statement. Thereafter, if the dispute is finally resolved under Sub-Clause 20.4 [Obtaining Dispute Board's Decision] or Sub-Clause 20.5 [Amicable Settlement], the Contractor shall then prepare and submit to the Employer (with a copy to the Engineer) a Final Statement.

#### 14.12 Discharge

When submitting the Final Statement, the Contractor shall submit a discharge which confirms that the total of the Final Statement represents full and final settlement of all moneys due to the Contractor under or in connection with the Contract. This discharge may state that it becomes effective when the



Contractor has received the Performance Security and the outstanding balance of this total, in which event the discharge shall be effective on such date.

#### **14.13 Issue of Final Payment Certificate**

Within 28 days after receiving the Final Statement and discharge in accordance with Sub-Clause 14.11 [Application for Final Payment Certificate] and Sub-Clause 14.12 [Discharge], the Engineer shall deliver to the Employer and to the Contractor, the Final Payment Certificate which shall state:

- (a) the amount which he fairly determines is finally due, and
- (b) after giving credit to the Employer for all amounts previously paid by the Employer and for all sums to which the Employer is entitled, the balance (if any) due from the Employer to the Contractor or from the Contractor to the Employer, as the case may be.

If the Contractor has not applied for a Final Payment Certificate in accordance with Sub-Clause 14.11 [Application for Final Payment Certificate] and Sub-Clause 14.12 [Discharge], the Engineer shall request the Contractor to do so. If the Contractor fails to submit an application within a period of 28 days, the Engineer shall issue the Final Payment Certificate for such amount as he fairly determines to be due.

#### **14.14 Cessation of Employer's Liability**

The Employer shall not be liable to the Contractor for any matter or thing under or in connection with the Contract or execution of the Works, except to the extent that the Contractor shall have included an amount expressly for it:

- (a) in the Final Statement and also
- (b) (except for matters or things arising after the issue of the Taking-Over Certificate for the Works) in the Statement at completion described in Sub-Clause 14.10 [Statement at Completion].

However, this Sub-Clause shall not limit the Employer's liability under his indemnification obligations, or the Employer's liability in any case of fraud, deliberate default or reckless misconduct by the Employer.

#### **14.15 Currencies of Payment**

The Contract Price shall be paid in the currency or currencies named in the Schedule of Payment Currencies. If more than one currency is so named, payments shall be made as follows:

- (a) if the Accepted Contract Amount was expressed in Local Currency only:



- (i) the proportions or amounts of the Local and Foreign Currencies, and the fixed rates of exchange to be used for calculating the payments, shall be as stated in the Schedule of Payment Currencies, except as otherwise agreed by both Parties;
  - (ii) payments and deductions under Sub-Clause 13.5 [Provisional Sums] and Sub-Clause 13.7 [Adjustments for Changes in Legislation] shall be made in the applicable currencies and proportions; and
  - (iii) other payments and deductions under sub-paragraphs (a) to (d) of Sub-Clause 14.3 [Application for Interim Payment Certificates] shall be made in the currencies and proportions specified in sub-paragraph (a)(i) above;
- (b) payment of the damages specified in the Contract Data, shall be made in the currencies and proportions specified in the Schedule of Payment Currencies;
  - (c) other payments to the Employer by the Contractor shall be made in the currency in which the sum was expended by the Employer, or in such currency as may be agreed by both Parties;
  - (d) if any amount payable by the Contractor to the Employer in a particular currency exceeds the sum payable by the Employer to the Contractor in that currency, the Employer may recover the balance of this amount from the sums otherwise payable to the Contractor in other currencies; and
  - (e) if no rates of exchange are stated in the Schedule of Payment Currencies, they shall be those prevailing on the Base Date and determined by the central bank of the Country.

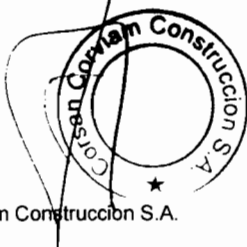
## 15. Termination by Employer

### 15.1 Notice to Correct

If the Contractor fails to carry out any obligation under the Contract, the Engineer may by notice require the Contractor to make good the failure and to remedy it within a specified reasonable time.

### 15.2 Termination by Employer

The Employer shall be entitled to terminate the Contract if the Contractor:



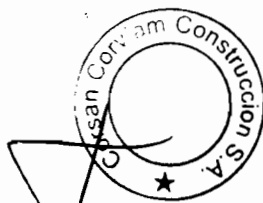
Corsan Corviam Construccion S.A.  
Contractor

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

- (a) fails to comply with Sub-Clause 4.2 [Performance Security] or with a notice under Sub-Clause 15.1 [Notice to Correct],
- (b) abandons the Works or otherwise plainly demonstrates the intention not to continue performance of his obligations under the Contract,
- (c) without reasonable excuse fails:
  - (i) to proceed with the Works in accordance with Clause 8 [Commencement, Delays and Suspension], or
  - (ii) to comply with a notice issued under Sub-Clause 7.5 [Rejection] or Sub-Clause 7.6 [Remedial Work], within 28 days after receiving it,
- (d) subcontracts the whole of the Works or assigns the Contract without the required agreement,
- (e) becomes bankrupt or insolvent, goes into liquidation, has a receiving or administration order made against him, compounds with his creditors, or carries on business under a receiver, trustee or manager for the benefit of his creditors, or if any act is done or event occurs which (under applicable Laws) has a similar effect to any of these acts or events, or
- (f) gives or offers to give (directly or indirectly) to any person any bribe, gift, gratuity, commission or other thing of value, as an inducement or reward:
  - (i) for doing or forbearing to do any action in relation to the Contract, or
  - (ii) for showing or forbearing to show favour or disfavour to any person in relation to the Contract,

or if any of the Contractor's Personnel, agents or Subcontractors gives or offers to give (directly or indirectly) to any person any such inducement or reward as is described in this sub-paragraph (f). However, lawful inducements and rewards to Contractor's Personnel shall not entitle termination.

In any of these events or circumstances, the Employer may, upon giving 14 days' notice to the Contractor, terminate the Contract and expel the Contractor from the Site. However, in the case of sub-paragraph (e) or (f), the Employer may by notice terminate the Contract immediately.



The Employer's election to terminate the Contract shall not prejudice any other rights of the Employer, under the Contract or otherwise.

The Contractor shall then leave the Site and deliver any required Goods, all Contractor's Documents, and other design documents made by or for him, to the Engineer. However, the Contractor shall use his best efforts to comply immediately with any reasonable instructions included in the notice (i) for the assignment of any subcontract, and (ii) for the protection of life or property or for the safety of the Works.

After termination, the Employer may complete the Works and/or arrange for any other entities to do so. The Employer and these entities may then use any Goods, Contractor's Documents and other design documents made by or on behalf of the Contractor.

The Employer shall then give notice that the Contractor's Equipment and Temporary Works will be released to the Contractor at or near the Site. The Contractor shall promptly arrange their removal, at the risk and cost of the Contractor. However, if by this time the Contractor has failed to make a payment due to the Employer, these items may be sold by the Employer in order to recover this payment. Any balance of the proceeds shall then be paid to the Contractor.

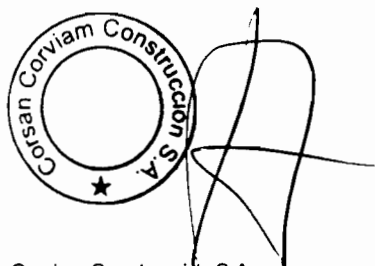
### 15.3 Valuation at Date of Termination

As soon as practicable after a notice of termination under Sub-Clause 15.2 [Termination by Employer] has taken effect, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine the value of the Works, Goods and Contractor's Documents, and any other sums due to the Contractor for work executed in accordance with the Contract.


### 15.4 Payment after Termination

After a notice of termination under Sub-Clause 15.2 [Termination by Employer] has taken effect, the Employer may:

- (a) proceed in accordance with Sub-Clause 2.5 [Employer's Claims],
- (b) withhold further payments to the Contractor until the costs of execution, completion and remedying of any defects, damages for delay in completion (if any), and all other costs incurred by the Employer, have been established, and/or
- (c) recover from the Contractor any losses and damages incurred by the Employer and any extra costs of completing the Works, after allowing for any sum due to



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Contractor



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

the Contractor under Sub-Clause 15.3 [Valuation at Date of Termination]. After recovering any such losses, damages and extra costs, the Employer shall pay any balance to the Contractor.

**15.5 Employer's Entitlement to Termination for Convenience**

The Employer shall be entitled to terminate the Contract, at any time for the Employer's convenience, by giving notice of such termination to the Contractor. The termination shall take effect 28 days after the later of the dates on which the Contractor receives this notice or the Employer returns the Performance Security. The Employer shall not terminate the Contract under this Sub-Clause in order to execute the Works himself or to arrange for the Works to be executed by another contractor or to avoid a termination of the Contract by the Contractor under Sub-Clause 16.2 [Termination by Contractor].

After this termination, the Contractor shall proceed in accordance with Sub-Clause 16.3 [Cessation of Work and Removal of Contractor's equipment] and shall be paid in accordance with Sub-Clause 16.4 [Payment on Termination].

**15.6 Corrupt or Fraudulent Practices**

If the Employer determines that the Contractor and/or any of its personnel, or its agents, or its Subcontractors, subconsultants, services providers, suppliers and/or their employees 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 15 shall apply as if such expulsion had been made under Sub-Clause 15.2 [Termination by Employer].

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 Sub-Clause 6.9 [Contractor's Personnel].

For the purposes of this Sub-Clause:

- (i) "corrupt practice" is the offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party<sup>7</sup>;

<sup>7</sup> "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.



- (ii) “fraudulent practice” 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<sup>8</sup>;
- (iii) “collusive practice” is an arrangement between two or more parties<sup>9</sup> designed to achieve an improper purpose, including to influence improperly the actions of another party;
- (iv) “coercive practice” is impairing or harming, or threatening to impair or harm, directly or indirectly, any party<sup>10</sup> 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 1.15 [Inspections and Audits by the Bank].

## 16. Suspension and Termination by Contractor

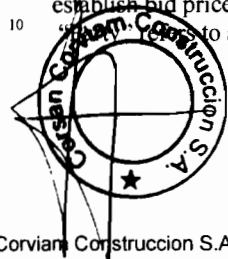
### 16.1 Contractor’s Entitlement to Suspend Work

If the Engineer fails to certify in accordance with Sub-Clause 14.6 [Issue of Interim Payment Certificates] or the Employer fails to comply with Sub-Clause 2.4 [Employer’s Financial Arrangements] or Sub-Clause 14.7 [Payment], the Contractor may, after giving not

<sup>8</sup> “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.

<sup>9</sup> “Parties” refers to participants in the procurement process (including public officials) attempting to establish bid prices at artificial, non competitive levels.

<sup>10</sup> “Party” refers to a participant in the procurement process or contract execution.



less than 21 days' notice to the Employer, suspend work (or reduce the rate of work) unless and until the Contractor has received the Payment Certificate, reasonable evidence or payment, as the case may be and as described in the notice.

Notwithstanding the above, if the Bank has suspended disbursements under the loan or credit from which payments to the Contractor are being made, in whole or in part, for the execution of the Works, and no alternative funds are available as provided for in Sub-Clause 2.4 [Employer's Financial Arrangements], the Contractor may by notice suspend work or reduce the rate of work at any time, but not less than 7 days after the Borrower having received the suspension notification from the Bank.

The Contractor's action shall not prejudice his entitlements to financing charges under Sub-Clause 14.8 [Delayed Payment] and to termination under Sub-Clause 16.2 [Termination by Contractor].

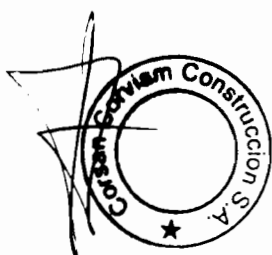
If the Contractor subsequently receives such Payment Certificate, evidence or payment (as described in the relevant Sub-Clause and in the above notice) before giving a notice of termination, the Contractor shall resume normal working as soon as is reasonably practicable.

If the Contractor suffers delay and/or incurs Cost as a result of suspending work (or reducing the rate of work) in accordance with this Sub-Clause, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

- (a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
- (b) payment of any such Cost plus profit, which shall be included in the Contract Price.

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.


## 16.2 Termination by Contractor



Corsan Corviam Construcccion S.A.  
Contractor

The Contractor shall be entitled to terminate the Contract if:

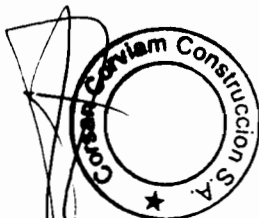
- i) the Contractor does not receive the reasonable evidence within 42 days after giving notice under Sub-Clause 16.1 [Contractor's Entitlement to Suspend Work] in respect of

  
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World Bank Projects, Odisha  
Chief Engineer Employer  
World Bank Project  
O/o the E.I.C.(Civil), Odisha  
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a failure to comply with Sub-Clause 2.4 [Employer's Financial Arrangements],

- ii) the Engineer fails, within 56 days after receiving a Statement and supporting documents, to issue the relevant Payment Certificate,
- iii) the Contractor does not receive the amount due under an Interim Payment Certificate within 42 days after the expiry of the time stated in Sub-Clause 14.7 [Payment] within which payment is to be made (except for deductions in accordance with Sub-Clause 2.5 [Employer's Claims]),
- iv) the Employer substantially fails to perform his obligations under the Contract in such manner as to materially and adversely affect the economic balance of the Contract and/or the ability of the Contractor to perform the Contract,
- v) the Employer fails to comply with Sub-Clause 1.6 [Contract Agreement] or Sub-Clause 1.7 [Assignment],
- vi) a prolonged suspension affects the whole of the Works as described in Sub-Clause 8.11 [Prolonged Suspension], or
- vii) the Employer becomes bankrupt or insolvent, goes into liquidation, has a receiving or administration order made against him, compounds with his creditors, or carries on business under a receiver, trustee or manager for the benefit of his creditors, or if any act is done or event occurs which (under applicable Laws) has a similar effect to any of these acts or events.
- viii) In the event the Bank suspends the loan or credit from which part of the payments to the Contractor are being made, if the Contractor has not received the sums due to him upon expiration of the 14 days referred to in Sub-Clause 14.7 [Payment] for payments under Interim Payment certificates, the Contractor may, without prejudice to the Contractor's entitlement to financing charges under Sub-Clause 14.8 [Delayed Payment], take one of the following actions, namely (i) suspend work or reduce the rate of work, or (ii) terminate his employment under the Contract by giving notice to the Employer, with a copy to the Engineer, such termination to take effect 14 days after the giving of the notice.
- ix) the Contractor does not receive the Engineer's instruction



recording the agreement of both Parties on the fulfilment of the conditions for the Commencement of Works under Sub-Clause 8.1 [Commencement of Works].

In any of these events or circumstances, the Contractor may, upon giving 14 days' notice to the Employer, terminate the Contract. However, in the case of sub-paragraph (f) or (g), the Contractor may by notice terminate the Contract immediately.

The Contractor's election to terminate the Contract shall not prejudice any other rights of the Contractor, under the Contract or otherwise.

### 16.3 Cessation of Work and Removal of Contractor's Equipment

After a notice of termination under Sub-Clause 15.5 [Employer's Entitlement to Termination for Convenience], Sub-Clause 16.2 [Termination by Contractor] or Sub-Clause 19.6 [Optional Termination, Payment and Release] has taken effect, the Contractor shall promptly:

- (a) cease all further work, except for such work as may have been instructed by the Engineer for the protection of life or property or for the safety of the Works,
- (b) hand over Contractor's Documents, Plant, Materials and other work, for which the Contractor has received payment, and
- (c) remove all other Goods from the Site, except as necessary for safety, and leave the Site.

### 16.4 Payment on Termination

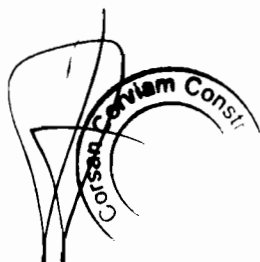
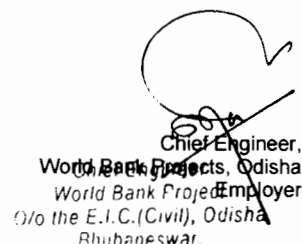
After a notice of termination under Sub-Clause 16.2 [Termination by Contractor] has taken effect, the Employer shall promptly:

- (a) return the Performance Security to the Contractor,
- (b) pay the Contractor in accordance with Sub-Clause 19.6 [Optional Termination, Payment and Release], and
- (c) pay to the Contractor the amount of any loss or damage sustained by the Contractor as a result of this termination.

## 17. Risk and Responsibility

### 17.1 Indemnities

The Contractor shall indemnify and hold harmless the Employer, the Employer's Personnel, and their respective agents, against and from all claims, damages, losses and expenses (including legal fees and expenses) in respect of:

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

- (a) bodily injury, sickness, disease or death, of any person whatsoever arising out of or in the course of or by reason of the Contractor's design (if any), the execution and completion of the Works and the remedying of any defects, unless attributable to any negligence, wilful act or breach of the Contract by the Employer, the Employer's Personnel, or any of their respective agents, and
- (b) damage to or loss of any property, real or personal (other than the Works), to the extent that such damage or loss arises out of or in the course of or by reason of the Contractor's design (if any), the execution and completion of the Works and the remedying of any defects, unless and to the extent that any such damage or loss is attributable to any negligence, wilful act or breach of the Contract by the Employer, the Employer's Personnel, their respective agents, or anyone directly or indirectly employed by any of them.

The Employer shall indemnify and hold harmless the Contractor, the Contractor's Personnel, and their respective agents, against and from all claims, damages, losses and expenses (including legal fees and expenses) in respect of (1) bodily injury, sickness, disease or death, which is attributable to any negligence, wilful act or breach of the Contract by the Employer, the Employer's Personnel, or any of their respective agents, and (2) the matters for which liability may be excluded from insurance cover, as described in sub-paragraphs (d)(i), (ii) and (iii) of Sub-Clause 18.3 [Insurance Against Injury to Persons and Damage to Property].

## 17.2 Contractor's Care of the Works

The Contractor shall take full responsibility for the care of the Works and Goods from the Commencement Date until the Taking-Over Certificate is issued (or is deemed to be issued under Sub-Clause 10.1 [Taking Over of the Works and Sections]) for the Works, when responsibility for the care of the Works shall pass to the Employer. If a Taking-Over Certificate is issued (or is so deemed to be issued) for any Section or part of the Works, responsibility for the care of the Section or part shall then pass to the Employer.

After responsibility has accordingly passed to the Employer, the Contractor shall take responsibility for the care of any work which is outstanding on the date stated in a Taking-Over Certificate, until this outstanding work has been completed.

If any loss or damage happens to the Works, Goods or Contractor's



Documents during the period when the Contractor is responsible for their care, from any cause not listed in Sub-Clause 17.3 [Employer's Risks], the Contractor shall rectify the loss or damage at the Contractor's risk and cost, so that the Works, Goods and Contractor's Documents conform with the Contract.

The Contractor shall be liable for any loss or damage caused by any actions performed by the Contractor after a Taking-Over Certificate has been issued. The Contractor shall also be liable for any loss or damage which occurs after a Taking-Over Certificate has been issued and which arose from a previous event for which the Contractor was liable.

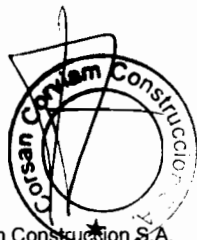
### 17.3 Employer's Risks

The risks referred to in Sub-Clause 17.4 [Consequences of Employer's Risks] below, insofar as they directly affect the execution of the Works in the Country, are:

- (a) war, hostilities (whether war be declared or not), invasion, act of foreign enemies,
- (b) rebellion, terrorism, sabotage by persons other than the Contractor's Personnel, revolution, insurrection, military or usurped power, or civil war, within the Country,
- (c) riot, commotion or disorder within the Country by persons other than the Contractor's Personnel,
- (d) munitions of war, explosive materials, ionising radiation or contamination by radio-activity, within the Country, except as may be attributable to the Contractor's use of such munitions, explosives, radiation or radio-activity,
- (e) pressure waves caused by aircraft or other aerial devices travelling at sonic or supersonic speeds,
- (f) use or occupation by the Employer of any part of the Permanent Works, except as may be specified in the Contract,
- (g) design of any part of the Works by the Employer's Personnel or by others for whom the Employer is responsible, and
- (h) any operation of the forces of nature which is Unforeseeable or against which an experienced contractor could not reasonably have been expected to have taken adequate preventative precautions.

### 17.4 Consequences of Employer's Risks

If and to the extent that any of the risks listed in Sub-Clause 17.3 above results in loss or damage to the Works, Goods or Contractor's Documents, the Contractor shall promptly give



notice to the Engineer and shall rectify this loss or damage to the extent required by the Engineer.

If the Contractor suffers delay and/or incurs Cost from rectifying this loss or damage, the Contractor shall give a further notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

- (a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
- (b) payment of any such Cost, which shall be included in the Contract Price. In the case of sub-paragraphs (f) and (g) of Sub-Clause 17.3 [Employer's Risks], Cost plus profit shall be payable.

After receiving this further notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

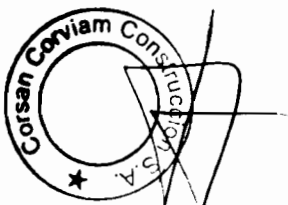
### 17.5 Intellectual and Industrial Property Rights

In this Sub-Clause, "infringement" means an infringement (or alleged infringement) of any patent, registered design, copyright, trade mark, trade name, trade secret or other intellectual or industrial property right relating to the Works; and "claim" means a claim (or proceedings pursuing a claim) alleging an infringement.


Whenever a Party does not give notice to the other Party of any claim within 28 days of receiving the claim, the first Party shall be deemed to have waived any right to indemnity under this Sub-Clause.

The Employer shall indemnify and hold the Contractor harmless against and from any claim alleging an infringement which is or was:

- (a) an unavoidable result of the Contractor's compliance with the Contract, or
- (b) a result of any Works being used by the Employer:
  - (i) for a purpose other than that indicated by, or reasonably to be inferred from, the Contract, or
  - (ii) in conjunction with any thing not supplied by the Contractor, unless such use was disclosed to the Contractor prior to the Base Date or is stated in the



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The Contractor shall indemnify and hold the Employer harmless against and from any other claim which arises out of or in relation to (i) the manufacture, use, sale or import of any Goods, or (ii) any design for which the Contractor is responsible.

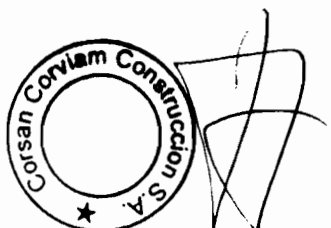
If a Party is entitled to be indemnified under this Sub-Clause, the indemnifying Party may (at its cost) conduct negotiations for the settlement of the claim, and any litigation or arbitration which may arise from it. The other Party shall, at the request and cost of the indemnifying Party, assist in contesting the claim. This other Party (and its Personnel) shall not make any admission which might be prejudicial to the indemnifying Party, unless the indemnifying Party failed to take over the conduct of any negotiations, litigation or arbitration upon being requested to do so by such other Party.

### 17.6 Limitation of Liability

Neither Party shall be liable to the other Party for loss of use of any Works, loss of profit, loss of any contract or for any indirect or consequential loss or damage which may be suffered by the other Party in connection with the Contract, other than as specifically provided in Sub-Clause 8.7 [Delay Damages]; Sub-Clause 11.2 [Cost of Remedying Defects]; Sub-Clause 15.4 [Payment after Termination]; Sub-Clause 16.4 [Payment on Termination]; Sub-Clause 17.1 [Indemnities]; Sub-Clause 17.4 (b) [Consequences of Employer's Risks] and Sub-Clause 17.5 [Intellectual and Industrial Property Rights].

The total liability of the Contractor to the Employer, under or in connection with the Contract other than under Sub-Clause 4.19 [Electricity, Water and Gas], Sub-Clause 4.20 [Employer's Equipment and Free-Issue Material], Sub-Clause 17.1 [Indemnities] and Sub-Clause 17.5 [Intellectual and Industrial Property Rights], shall not exceed the sum resulting from the application of a multiplier (less or greater than one) to the Accepted Contract Amount, as stated in the Contract Data, or (if such multiplier or other sum is not so stated), the Accepted Contract Amount.

This Sub-Clause shall not limit liability in any case of fraud, deliberate default or reckless misconduct by the defaulting Party.



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**17.7 Use of  
Employer's  
Accomoda-  
tion/Facilities**

The Contractor shall take full responsibility for the care of the Employer provided accommodation and facilities, if any, as detailed in the Specification, from the respective dates of hand-over to the Contractor until cessation of occupation (where hand-over or cessation of occupation may take place after the date stated in the Taking-Over Certificate for the Works).

If any loss or damage happens to any of the above items while the Contractor is responsible for their care arising from any cause whatsoever other than those for which the Employer is liable, the Contractor shall, at his own cost, rectify the loss or damage to the satisfaction of the Engineer.

**18. Insurance**

**18.1 General  
Requirements for  
Insurances**

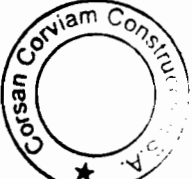
In this Clause, "insuring Party" means, for each type of insurance, the Party responsible for effecting and maintaining the insurance specified in the relevant Sub-Clause.

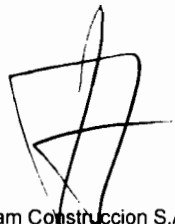
Wherever the Contractor is the insuring Party, each insurance shall be effected with insurers and in terms acceptable to the Employer. These terms shall be consistent with any terms agreed by both Parties before the date of the Letter of Acceptance. This agreement of terms shall take precedence over the provisions of this Clause.


Wherever the Employer is the insuring Party, each insurance shall be effected with insurers and in terms acceptable to the Contractor. These terms shall be consistent with any terms agreed by both Parties before the date of the Letter of Acceptance. This agreement of terms shall take precedence over the provisions of this Clause.

If a policy is required to indemnify joint insured, the cover shall apply separately to each insured as though a separate policy had been issued for each of the joint insured. If a policy indemnifies additional joint insured, namely in addition to the insured specified in this Clause, (i) the Contractor shall act under the policy on behalf of these additional joint insured except that the Employer shall act for Employer's Personnel, (ii) additional joint insured shall not be entitled to receive payments directly from the insurer or to have any other direct dealings with the insurer, and (iii) the insuring Party shall require all additional joint insured to comply with the conditions stipulated in the policy.

Each policy insuring against loss or damage shall provide for payments to be made in the currencies required to rectify the

  
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loss or damage. Payments received from insurers shall be used for the rectification of the loss or damage.

The relevant insuring Party shall, within the respective periods stated in the Contract Data (calculated from the Commencement Date), submit to the other Party:

- (a) evidence that the insurances described in this Clause have been effected, and
- (b) copies of the policies for the insurances described in Sub-Clause 18.2 [Insurance for Works and Contractor's Equipment] and Sub-Clause 18.3 [Insurance against Injury to Persons and Damage to Property].

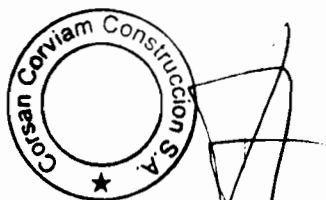
When each premium is paid, the insuring Party shall submit evidence of payment to the other Party. Whenever evidence or policies are submitted, the insuring Party shall also give notice to the Engineer.

Each Party shall comply with the conditions stipulated in each of the insurance policies. The insuring Party shall keep the insurers informed of any relevant changes to the execution of the Works and ensure that insurance is maintained in accordance with this Clause.

Neither Party shall make any material alteration to the terms of any insurance without the prior approval of the other Party. If an insurer makes (or attempts to make) any alteration, the Party first notified by the insurer shall promptly give notice to the other Party.

If the insuring Party fails to effect and keep in force any of the insurances it is required to effect and maintain under the Contract, or fails to provide satisfactory evidence and copies of policies in accordance with this Sub-Clause, the other Party may (at its option and without prejudice to any other right or remedy) effect insurance for the relevant coverage and pay the premiums due. The insuring Party shall pay the amount of these premiums to the other Party, and the Contract Price shall be adjusted accordingly.

Nothing in this Clause limits the obligations, liabilities or responsibilities of the Contractor or the Employer, under the other terms of the Contract or otherwise. Any amounts not insured or not recovered from the insurers shall be borne by the Contractor and/or the Employer in accordance with these obligations, liabilities or responsibilities. However, if the



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insuring Party fails to effect and keep in force an insurance which is available and which it is required to effect and maintain under the Contract, and the other Party neither approves the omission nor effects insurance for the coverage relevant to this default, any moneys which should have been recoverable under this insurance shall be paid by the insuring Party.

Payments by one Party to the other Party shall be subject to Sub-Clause 2.5 [Employer's Claims] or Sub-Clause 20.1 [Contractor's Claims], as applicable.

The Contractor shall be entitled to place all insurance relating to the Contract (including, but not limited to the insurance referred to Clause 18) with insurers from any eligible source country.

## 18.2 Insurance for Works and Contractor's Equipment

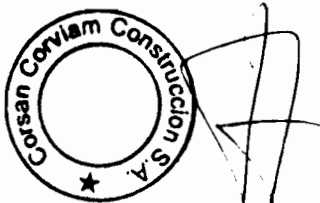
The insuring Party shall insure the Works, Plant, Materials and Contractor's Documents for not less than the full reinstatement cost including the costs of demolition, removal of debris and professional fees and profit. This insurance shall be effective from the date by which the evidence is to be submitted under sub-paragraph (a) of Sub-Clause 18.1 [General Requirements for Insurances], until the date of issue of the Taking-Over Certificate for the Works.

The insuring Party shall maintain this insurance to provide cover until the date of issue of the Performance Certificate, for loss or damage for which the Contractor is liable arising from a cause occurring prior to the issue of the Taking-Over Certificate, and for loss or damage caused by the Contractor in the course of any other operations (including those under Clause 11 [Defects Liability]).


The insuring Party shall insure the Contractor's Equipment for not less than the full replacement value, including delivery to Site. For each item of Contractor's Equipment, the insurance shall be effective while it is being transported to the Site and until it is no longer required as Contractor's Equipment.

Unless otherwise stated in the Particular Conditions, insurances under this Sub-Clause:

- (a) shall be effected and maintained by the Contractor as insuring Party,
- (b) shall be in the joint names of the Parties, who shall be jointly entitled to receive payments from the insurers, payments being held or allocated to the Party actually



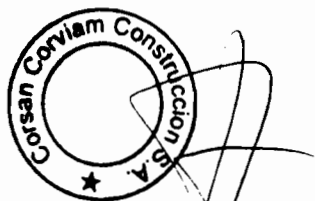
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bearing the costs of rectifying the loss or damage,

- (c) shall cover all loss and damage from any cause not listed in Sub-Clause 17.3 [Employer's Risks],
- (d) shall also cover, to the extent specifically required in the bidding documents of the Contract, loss or damage to a part of the Works which is attributable to the use or occupation by the Employer of another part of the Works, and loss or damage from the risks listed in sub-paragraphs (c), (g) and (h) of Sub-Clause 17.3 [Employer's Risks], excluding (in each case) risks which are not insurable at commercially reasonable terms, with deductibles per occurrence of not more than the amount stated in the Contract Data (if an amount is not so stated, this sub-paragraph (d) shall not apply), and
- (e) may however exclude loss of, damage to, and reinstatement of:
  - (i) a part of the Works which is in a defective condition due to a defect in its design, materials or workmanship (but cover shall include any other parts which are lost or damaged as a direct result of this defective condition and not as described in sub-paragraph (ii) below),
  - (ii) a part of the Works which is lost or damaged in order to reinstate any other part of the Works if this other part is in a defective condition due to a defect in its design, materials or workmanship,
  - (iii) a part of the Works which has been taken over by the Employer, except to the extent that the Contractor is liable for the loss or damage, and
  - (iv) Goods while they are not in the Country, subject to Sub-Clause 14.5 [Plant and Materials intended for the Works].

If, more than one year after the Base Date, the cover described in sub-paragraph (d) above ceases to be available at commercially reasonable terms, the Contractor shall (as insuring Party) give notice to the Employer, with supporting particulars. The Employer shall then (i) be entitled subject to Sub-Clause 2.5 [Employer's Claims] to payment of an amount equivalent to such commercially reasonable terms as the Contractor should have expected to have paid for such cover, and (ii) be deemed,



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unless he obtains the cover at commercially reasonable terms, to have approved the omission under Sub-Clause 18.1 [General Requirements for Insurances].

**18.3 Insurance against Injury to Persons and Damage to Property**

The insuring Party shall insure against each Party's liability for any loss, damage, death or bodily injury which may occur to any physical property (except things insured under Sub-Clause 18.2 [Insurance for Works and Contractor's Equipment]) or to any person (except persons insured under Sub-Clause 18.4 [Insurance for Contractor's Personnel]), which may arise out of the Contractor's performance of the Contract and occurring before the issue of the Performance Certificate.

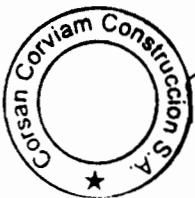
This insurance shall be for a limit per occurrence of not less than the amount stated in the Contract Data, with no limit on the number of occurrences. If an amount is not stated in the Contract Data, this Sub-Clause shall not apply.

Unless otherwise stated in the Particular Conditions, the insurances specified in this Sub-Clause:


- (a) shall be effected and maintained by the Contractor as insuring Party,
- (b) shall be in the joint names of the Parties,
- (c) shall be extended to cover liability for all loss and damage to the Employer's property (except things insured under Sub-Clause 18.2) arising out of the Contractor's performance of the Contract, and
- (d) may however exclude liability to the extent that it arises from:
  - (i) the Employer's right to have the Permanent Works executed on, over, under, in or through any land, and to occupy this land for the Permanent Works,
  - (ii) damage which is an unavoidable result of the Contractor's obligations to execute the Works and remedy any defects, and
  - (iii) a cause listed in Sub-Clause 17.3 [Employer's Risks], except to the extent that cover is available at commercially reasonable terms.

**18.4 Insurance for Contractor's**

The Contractor shall effect and maintain insurance against liability for claims, damages, losses and expenses (including



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legal fees and expenses) arising from injury, sickness, disease or death of any person employed by the Contractor or any other of the Contractor's Personnel.

The insurance shall cover the Employer and the Engineer against liability for claims, damages, losses and expenses (including legal fees and expenses) arising from injury, sickness, disease or death of any person employed by the Contractor or any other of the Contractor's Personnel, except that this insurance may exclude losses and claims to the extent that they arise from any act or neglect of the Employer or of the Employer's Personnel.

The insurance shall be maintained in full force and effect during the whole time that these personnel are assisting in the execution of the Works. For a Subcontractor's employees, the insurance may be effected by the Subcontractor, but the Contractor shall be responsible for compliance with this Clause.

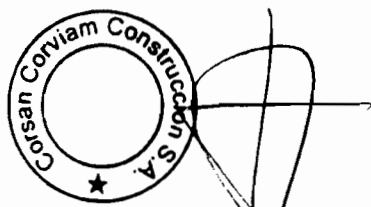
**19. Force Majeure****19.1 Definition of Force Majeure**

In this Clause, "Force Majeure" means an exceptional event or circumstance:


- (a) which is beyond a Party's control,
- (b) which such Party could not reasonably have provided against before entering into the Contract,
- (c) which, having arisen, such Party could not reasonably have avoided or overcome, and
- (d) which is not substantially attributable to the other Party.

Force Majeure may include, but is not limited to, exceptional events or circumstances of the kind listed below, so long as conditions (a) to (d) above are satisfied:

- (i) war, hostilities (whether war be declared or not), invasion, act of foreign enemies,
- (ii) rebellion, terrorism, sabotage by persons other than the Contractor's Personnel, revolution, insurrection, military or usurped power, or civil war,
- (iii) riot, commotion, disorder, strike or lockout by persons other than the Contractor's Personnel,
- (iv) munitions of war, explosive materials, ionising radiation or contamination by radio-activity, except



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as may be attributable to the Contractor's use of such munitions, explosives, radiation or radio-activity, and

- (v) natural catastrophes such as earthquake, hurricane, typhoon or volcanic activity.

**19.2 Notice of Force Majeure**

If a Party is or will be prevented from performing its substantial obligations under the Contract by Force Majeure, then it shall give notice to the other Party of the event or circumstances constituting the Force Majeure and shall specify the obligations, the performance of which is or will be prevented. The notice shall be given within 14 days after the Party became aware, or should have become aware, of the relevant event or circumstance constituting Force Majeure.

The Party shall, having given notice, be excused performance of its obligations for so long as such Force Majeure prevents it from performing them.

Notwithstanding any other provision of this Clause, Force Majeure shall not apply to obligations of either Party to make payments to the other Party under the Contract.

**19.3 Duty to Minimise Delay**

Each Party shall at all times use all reasonable endeavours to minimise any delay in the performance of the Contract as a result of Force Majeure.

A Party shall give notice to the other Party when it ceases to be affected by the Force Majeure.

**19.4 Consequences of Force Majeure**

If the Contractor is prevented from performing its substantial obligations under the Contract by Force Majeure of which notice has been given under Sub-Clause 19.2 [Notice of Force Majeure], and suffers delay and/or incurs Cost by reason of such Force Majeure, the Contractor shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

- (a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
- (b) if the event or circumstance is of the kind described in sub-paragraphs (i) to (iv) of Sub-Clause 19.1 [Definition of Force Majeure] and, in the case of sub-paragraphs (ii) to (iv), occurs in the Country, payment of any such Cost, including the costs of rectifying or replacing the Works and/or Goods damaged or destroyed by Force Majeure, to the extent they are not indemnified through the insurance policy referred to in Sub-Clause 18.2 [Insurance for



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Works and Contractor's Equipment].

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

**19.5 Force Majeure Affecting Subcontractor**

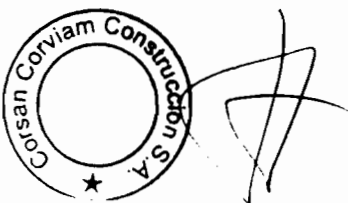
If any Subcontractor is entitled under any contract or agreement relating to the Works to relief from force majeure on terms additional to or broader than those specified in this Clause, such additional or broader force majeure events or circumstances shall not excuse the Contractor's non-performance or entitle him to relief under this Clause.

**19.6 Optional Termination, Payment and Release**


If the execution of substantially all the Works in progress is prevented for a continuous period of 84 days by reason of Force Majeure of which notice has been given under Sub-Clause 19.2 [Notice of Force Majeure], or for multiple periods which total more than 140 days due to the same notified Force Majeure, then either Party may give to the other Party a notice of termination of the Contract. In this event, the termination shall take effect 7 days after the notice is given, and the Contractor shall proceed in accordance with Sub-Clause 16.3 [Cessation of Work and Removal of Contractor's Equipment].

Upon such termination, the Engineer shall determine the value of the work done and issue a Payment Certificate which shall include:

- (a) the amounts payable for any work carried out for which a price is stated in the Contract;
- (b) the Cost of Plant and Materials ordered for the Works which have been delivered to the Contractor, or of which the Contractor is liable to accept delivery: this Plant and Materials shall become the property of (and be at the risk of) the Employer when paid for by the Employer, and the Contractor shall place the same at the Employer's disposal;
- (c) other Costs or liabilities which in the circumstances were reasonably and necessarily incurred by the Contractor in the expectation of completing the Works;
- (d) the Cost of removal of Temporary Works and Contractor's Equipment from the Site and the return of these items to the Contractor's works in his country (or to any other destination at no greater cost); and



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- (e) the Cost of repatriation of the Contractor's staff and labour employed wholly in connection with the Works at the date of termination.

### 19.7 Release from Performance

Notwithstanding any other provision of this Clause, if any event or circumstance outside the control of the Parties (including, but not limited to, Force Majeure) arises which makes it impossible or unlawful for either or both Parties to fulfil its or their contractual obligations or which, under the law governing the Contract, entitles the Parties to be released from further performance of the Contract, then upon notice by either Party to the other Party of such event or circumstance:

- (a) the Parties shall be discharged from further performance, without prejudice to the rights of either Party in respect of any previous breach of the Contract, and
- (b) the sum payable by the Employer to the Contractor shall be the same as would have been payable under Sub-Clause 19.6 [Optional Termination, Payment and Release] if the Contract had been terminated under Sub-Clause 19.6.

## 20. Claims, Disputes and Arbitration

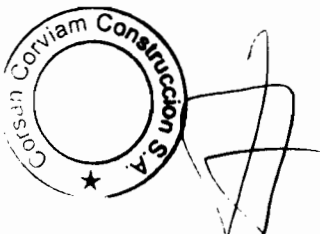
### 20.1 Contractor's Claims

If the Contractor considers himself to be entitled to any extension of the Time for Completion and/or any additional payment, under any Clause of these Conditions or otherwise in connection with the Contract, the Contractor shall give notice to the Engineer, describing the event or circumstance giving rise to the claim. The notice shall be given as soon as practicable, and not later than 28 days after the Contractor became aware, or should have become aware, of the event or circumstance.

If the Contractor fails to give notice of a claim within such period of 28 days, the Time for Completion shall not be extended, the Contractor shall not be entitled to additional payment, and the Employer shall be discharged from all liability in connection with the claim. Otherwise, the following provisions of this Sub-Clause shall apply.

The Contractor shall also submit any other notices which are required by the Contract, and supporting particulars for the claim, all as relevant to such event or circumstance.

The Contractor shall keep such contemporary records as may be necessary to substantiate any claim, either on the Site or at another location acceptable to the Engineer. Without admitting



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the Employer's liability, the Engineer may, after receiving any notice under this Sub-Clause, monitor the record-keeping and/or instruct the Contractor to keep further contemporary records. The Contractor shall permit the Engineer to inspect all these records, and shall (if instructed) submit copies to the Engineer.

Within 42 days after the Contractor became aware (or should have become aware) of the event or circumstance giving rise to the claim, or within such other period as may be proposed by the Contractor and approved by the Engineer, the Contractor shall send to the Engineer a fully detailed claim which includes full supporting particulars of the basis of the claim and of the extension of time and/or additional payment claimed. If the event or circumstance giving rise to the claim has a continuing effect:

- (a) this fully detailed claim shall be considered as interim;
- (b) the Contractor shall send further interim claims at monthly intervals, giving the accumulated delay and/or amount claimed, and such further particulars as the Engineer may reasonably require; and
- (c) the Contractor shall send a final claim within 28 days after the end of the effects resulting from the event or circumstance, or within such other period as may be proposed by the Contractor and approved by the Engineer.

Within 42 days after receiving a claim or any further particulars supporting a previous claim, or within such other period as may be proposed by the Engineer and approved by the Contractor, the Engineer shall respond with approval, or with disapproval and detailed comments. He may also request any necessary further particulars, but shall nevertheless give his response on the principles of the claim within the above defined time period.

Within the above defined period of 42 days, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine (i) the extension (if any) of the Time for Completion (before or after its expiry) in accordance with Sub-Clause 8.4 [Extension of Time for Completion], and/or (ii) the additional payment (if any) to which the Contractor is entitled under the Contract.

Each Payment Certificate shall include such additional payment for any claim as have been reasonably substantiated as due under the relevant provision of the Contract. Unless and until



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the particulars supplied are sufficient to substantiate the whole of the claim, the Contractor shall only be entitled to payment for such part of the claim as he has been able to substantiate.

If the Engineer does not respond within the timeframe defined in this Clause, either Party may consider that the claim is rejected by the Engineer and any of the Parties may refer it to the Dispute Board in accordance with Sub-Clause 20.4 [Obtaining Dispute Board's Decision].

The requirements of this Sub-Clause are in addition to those of any other Sub-Clause which may apply to a claim. If the Contractor fails to comply with this or another Sub-Clause in relation to any claim, any extension of time and/or additional payment shall take account of the extent (if any) to which the failure has prevented or prejudiced proper investigation of the claim, unless the claim is excluded under the second paragraph of this Sub-Clause.

## 20.2 Appointment of the Dispute Board

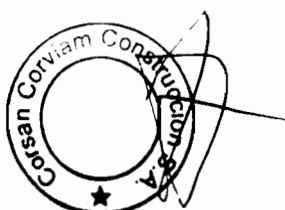
Disputes shall be referred to a DB for decision in accordance with Sub-Clause 20.4 [Obtaining Dispute Board's Decision]. The Parties shall appoint a DB by the date stated in the Contract Data.

The DB shall comprise, as stated in the Contract Data, either one or three suitably qualified persons ("the members"), each of whom shall be fluent in the language for communication defined in the Contract and shall be a professional experienced in the type of construction involved in the Works and with the interpretation of contractual documents. If the number is not so stated and the Parties do not agree otherwise, the DB shall comprise three persons.

If the Parties have not jointly appointed the DB 21 days before the date stated in the Contract Data and the DB is to comprise three persons, each Party shall nominate one member for the approval of the other Party. The first two members shall recommend and the Parties shall agree upon the third member, who shall act as chairman.

However, if a list of potential members has been agreed by the Parties and is included in the Contract, the members shall be selected from those on the list, other than anyone who is unable or unwilling to accept appointment to the DB.

The agreement between the Parties and either the sole member or each of the three members shall incorporate by reference the



General Conditions of Dispute Board Agreement contained in the Appendix to these General Conditions, with such amendments as are agreed between them.

The terms of the remuneration of either the sole member or each of the three members, including the remuneration of any expert whom the DB consults, shall be mutually agreed upon by the Parties when agreeing the terms of appointment. Each Party shall be responsible for paying one-half of this remuneration.

If at any time the Parties so agree, they may jointly refer a matter to the DB for it to give its opinion. Neither Party shall consult the DB on any matter without the agreement of the other Party.

If a member declines to act or is unable to act as a result of death, disability, resignation or termination of appointment, a replacement shall be appointed in the same manner as the replaced person was required to have been nominated or agreed upon, as described in this Sub-Clause.


The appointment of any member may be terminated by mutual agreement of both Parties, but not by the Employer or the Contractor acting alone. Unless otherwise agreed by both Parties, the appointment of the DB (including each member) shall expire when the discharge referred to in Sub-Clause 14.12 [Discharge] shall have become effective.


**20.3 Failure to Agree on the Composition of the Dispute Board**

If any of the following conditions apply, namely:

- (a) the Parties fail to agree upon the appointment of the sole member of the DB by the date stated in the first paragraph of Sub-Clause 20.2, [Appointment of the Dispute Board],
- (b) either Party fails to nominate a member (for approval by the other Party), or fails to approve a member nominated by the other Party, of a DB of three persons by such date,
- (c) the Parties fail to agree upon the appointment of the third member (to act as chairman) of the DB by such date, or
- (d) the Parties fail to agree upon the appointment of a replacement person within 42 days after the date on which the sole member or one of the three members declines to act or is unable to act as a result of death, disability, resignation or termination of appointment,

then the appointing entity or official named in the Contract Data shall, upon the request of either or both of the Parties and after

  
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due consultation with both Parties, appoint this member of the DB. This appointment shall be final and conclusive. Each Party shall be responsible for paying one-half of the remuneration of the appointing entity or official.

#### **20.4 Obtaining Dispute Board's Decision**

If a dispute (of any kind whatsoever) arises between the Parties in connection with, or arising out of, the Contract or the execution of the Works, including any dispute as to any certificate, determination, instruction, opinion or valuation of the Engineer, either Party may refer the dispute in writing to the DB for its decision, with copies to the other Party and the Engineer. Such reference shall state that it is given under this Sub-Clause.

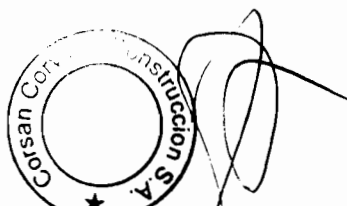
For a DB of three persons, the DB shall be deemed to have received such reference on the date when it is received by the chairman of the DB.

Both Parties shall promptly make available to the DB all such additional information, further access to the Site, and appropriate facilities, as the DB may require for the purposes of making a decision on such dispute. The DB shall be deemed to be not acting as arbitrator(s).


Within 84 days after receiving such reference, or within such other period as may be proposed by the DB and approved by both Parties, the DB shall give its decision, which shall be reasoned and shall state that it is given under this Sub-Clause. The decision shall be binding on both Parties, who shall promptly give effect to it unless and until it shall be revised in an amicable settlement or an arbitral award as described below. Unless the Contract has already been abandoned, repudiated or terminated, the Contractor shall continue to proceed with the Works in accordance with the Contract.

If either Party is dissatisfied with the DB's decision, then either Party may, within 28 days after receiving the decision, give notice to the other Party of its dissatisfaction and intention to commence arbitration. If the DB fails to give its decision within the period of 84 days (or as otherwise approved) after receiving such reference, then either Party may, within 28 days after this period has expired, give notice to the other Party of its dissatisfaction and intention to commence arbitration.

In either event, this notice of dissatisfaction shall state that it is given under this Sub-Clause, and shall set out the matter in dispute and the reason(s) for dissatisfaction. Except as stated in Sub-Clause 20.7 [Failure to Comply with Dispute Board's Decision] and Sub-Clause 20.8 [Expiry of Dispute Board's



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Appointment], neither Party shall be entitled to commence arbitration of a dispute unless a notice of dissatisfaction has been given in accordance with this Sub-Clause.

If the DB has given its decision as to a matter in dispute to both Parties, and no notice of dissatisfaction has been given by either Party within 28 days after it received the DB's decision, then the decision shall become final and binding upon both Parties.

## 20.5 Amicable Settlement

Where notice of dissatisfaction has been given under Sub-Clause 20.4 above, both Parties shall attempt to settle the dispute amicably before the commencement of arbitration. However, unless both Parties agree otherwise, arbitration may be commenced on or after the fifty-sixth day after the day on which a notice of dissatisfaction and intention to commence arbitration was given, even if no attempt at amicable settlement has been made.

## 20.6 Arbitration

Unless indicated otherwise in the Particular Conditions, any dispute not settled amicably and in respect of which the DB's decision (if any) has not become final and binding shall be finally settled by arbitration. Unless otherwise agreed by both Parties:

- (b) For contracts with foreign contractors, international arbitration with proceedings administered by the institution appointed in the Contract Data, conducted in accordance with the rules of arbitration of the appointed institution, if any, or in accordance with UNCITRAL arbitration rules, at the choice of the appointed institution,
- (c) the place of arbitration shall be the city where the headquarters of the appointed arbitration institution is located,
- (d) the arbitration shall be conducted in the language for communications defined in Sub-Clause 1.4 [Law and Language], and
- (e) For contracts with domestic contractors, arbitration with proceedings conducted in accordance with the laws of the Employer's country.

The arbitrators shall have full power to open up, review and revise any certificate, determination, instruction, opinion or valuation of the Engineer, and any decision of the DB, relevant to the dispute. Nothing shall disqualify representatives of the Parties and the Engineer from being called as a witness and



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giving evidence before the arbitrators on any matter whatsoever relevant to the dispute.

Neither Party shall be limited in the proceedings before the arbitrators to the evidence or arguments previously put before the DB to obtain its decision, or to the reasons for dissatisfaction given in its notice of dissatisfaction. Any decision of the DB shall be admissible in evidence in the arbitration.

Arbitration may be commenced prior to or after completion of the Works. The obligations of the Parties, the Engineer and the DB shall not be altered by reason of any arbitration being conducted during the progress of the Works.

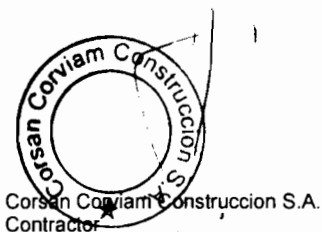
**20.7 Failure to Comply with Dispute Board's Decision**

In the event that a Party fails to comply with a final and binding DB decision, then the other Party may, without prejudice to any other rights it may have, refer the failure itself to arbitration under Sub-Clause 20.6 [Arbitration]. Sub-Clause 20.4 [Obtaining Dispute Board's Decision] and Sub-Clause 20.5 [Amicable Settlement] shall not apply to this reference.

**20.8 Expiry of Dispute Board's Appointment**

If a dispute arises between the Parties in connection with, or arising out of, the Contract or the execution of the Works and there is no DB in place, whether by reason of the expiry of the DB's appointment or otherwise:

- (a) Sub-Clause 20.4 [Obtaining Dispute Board's Decision] and Sub-Clause 20.5 [Amicable Settlement] shall not apply, and
- (b) the dispute may be referred directly to arbitration under Sub-Clause 20.6 [Arbitration].



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## APPENDIX

### A General Conditions of Dispute Board Agreement

#### 1. Definitions

Each "Dispute Board Agreement" is a tripartite agreement by and between:

- (a) the "Employer";
- (b) the "Contractor"; and
- (c) the "Member" who is defined in the Dispute Board Agreement as being:
  - (i) the sole member of the "DB" and, where this is the case, all references to the "Other Members" do not apply, or
  - (ii) one of the three persons who are jointly called the "DB" (or "Dispute Board") and, where this is the case, the other two persons are called the "Other Members."

The Employer and the Contractor have entered (or intend to enter) into a contract, which is called the "Contract" and is defined in the Dispute Board Agreement, which incorporates this Appendix. In the Dispute Board Agreement, words and expressions which are not otherwise defined shall have the meanings assigned to them in the Contract.

#### 2. General Provisions

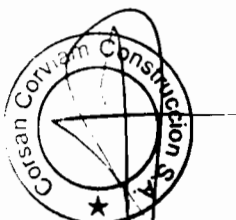
Unless otherwise stated in the Dispute Board Agreement, it shall take effect on the latest of the following dates:

- (a) the Commencement Date defined in the Contract,
- (b) when the Employer, the Contractor and the Member have each signed the Dispute Board Agreement, or
- (c) when the Employer, the Contractor and each of the Other Members (if any) have respectively each signed a dispute board agreement.

This employment of the Member is a personal appointment. At any time, the Member may give not less than 70 days' notice of resignation to the Employer and to the Contractor, and the Dispute Agreement shall terminate upon the expiry of this period.

#### 3. Warranties

The Member warrants and agrees that he/she is and shall be impartial and independent of the Employer, the Contractor and the Engineer. The Member shall promptly disclose, to each of them and to the Other Members (if any), any fact or circumstance which might appear inconsistent with his/her warranty and agreement of



impartiality and independence.

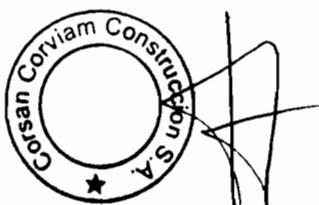
When appointing the Member, the Employer and the Contractor relied upon the Member's representations that he/she is:

- (a) experienced in the work which the Contractor is to carry out under the Contract,
- (b) experienced in the interpretation of contract documentation, and
- (c) fluent in the language for communications defined in the Contract.

#### 4. General Obligations of the Member

The Member shall:

- (a) have no interest financial or otherwise in the Employer, the Contractor or Engineer, nor any financial interest in the Contract except for payment under the Dispute Board Agreement;
- (b) not previously have been employed as a consultant or otherwise by the Employer, the Contractor or the Engineer, except in such circumstances as were disclosed in writing to the Employer and the Contractor before they signed the Dispute Board Agreement;
- (c) have disclosed in writing to the Employer, the Contractor and the Other Members (if any), before entering into the Dispute Board Agreement and to his/her best knowledge and recollection, any professional or personal relationships with any director, officer or employee of the Employer, the Contractor or the Engineer, and any previous involvement in the overall project of which the Contract forms part;
- (d) not, for the duration of the Dispute Board Agreement, be employed as a consultant or otherwise by the Employer, the Contractor or the Engineer, except as may be agreed in writing by the Employer, the Contractor and the Other Members (if any);
- (e) comply with the annexed procedural rules and with Sub-Clause 20.4 of the Conditions of Contract;
- (f) not give advice to the Employer, the Contractor, the Employer's Personnel or the Contractor's Personnel concerning the conduct of the Contract, other than in accordance with the annexed procedural rules;
- (g) not while a Member enter into discussions or make any agreement with the Employer, the Contractor or the Engineer



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regarding employment by any of them, whether as a consultant or otherwise, after ceasing to act under the Dispute Board Agreement;

- (h) ensure his/her availability for all site visits and hearings as are necessary;
- (i) become conversant with the Contract and with the progress of the Works (and of any other parts of the project of which the Contract forms part) by studying all documents received which shall be maintained in a current working file;
- (j) treat the details of the Contract and all the DB's activities and hearings as private and confidential, and not publish or disclose them without the prior written consent of the Employer, the Contractor and the Other Members (if any); and
- (k) be available to give advice and opinions, on any matter relevant to the Contract when requested by both the Employer and the Contractor, subject to the agreement of the Other Members (if any).

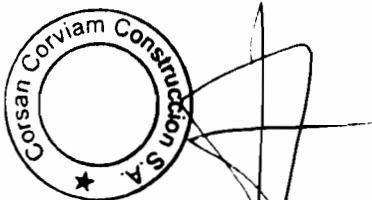
**5. General  
Obligations of the  
Employer and the  
Contractor**

The Employer, the Contractor, the Employer's Personnel and the Contractor's Personnel shall not request advice from or consultation with the Member regarding the Contract, otherwise than in the normal course of the DB's activities under the Contract and the Dispute Board Agreement. The Employer and the Contractor shall be responsible for compliance with this provision, by the Employer's Personnel and the Contractor's Personnel respectively.


The Employer and the Contractor undertake to each other and to the Member that the Member shall not, except as otherwise agreed in writing by the Employer, the Contractor, the Member and the Other Members (if any):

- (a) be appointed as an arbitrator in any arbitration under the Contract;
- (b) be called as a witness to give evidence concerning any dispute before arbitrator(s) appointed for any arbitration under the Contract; or
- (c) be liable for any claims for anything done or omitted in the discharge or purported discharge of the Member's functions, unless the act or omission is shown to have been in bad faith.

The Employer and the Contractor hereby jointly and severally indemnify and hold the Member harmless against and from claims from which he is relieved from liability under the preceding



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paragraph.

Whenever the Employer or the Contractor refers a dispute to the DB under Sub-Clause 20.4 of the Conditions of Contract, which will require the Member to make a site visit and attend a hearing, the Employer or the Contractor shall provide appropriate security for a sum equivalent to the reasonable expenses to be incurred by the Member. No account shall be taken of any other payments due or paid to the Member.

## 6. Payment

The Member shall be paid as follows, in the currency named in the Dispute Board Agreement:

- (a) a retainer fee per calendar month, which shall be considered as payment in full for:
  - (i) being available on 28 days' notice for all site visits and hearings;
  - (ii) becoming and remaining conversant with all project developments and maintaining relevant files;
  - (iii) all office and overhead expenses including secretarial services, photocopying and office supplies incurred in connection with his duties; and
  - (iv) all services performed hereunder except those referred to in sub-paragraphs (b) and (c) of this Clause.


The retainer fee shall be paid with effect from the last day of the calendar month in which the Dispute Board Agreement becomes effective; until the last day of the calendar month in which the Taking-Over Certificate is issued for the whole of the Works.

With effect from the first day of the calendar month following the month in which the Taking-Over Certificate is issued for the whole of the Works, the retainer fee shall be reduced by one third. This reduced fee shall be paid until the first day of the calendar month in which the Member resigns or the Dispute Board Agreement is otherwise terminated.

- (b) a daily fee which shall be considered as payment in full for:
  - (i) each day or part of a day up to a maximum of two days' travel time in each direction for the journey between the Member's home and the site, or another location of a meeting with the Other Members (if any);
  - (ii) each working day on Site visits, hearings or preparing



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decisions; and

- (iii) each day spent reading submissions in preparation for a hearing.
- (c) all reasonable expenses including necessary travel expenses (air fare in less than first class, hotel and subsistence and other direct travel expenses) incurred in connection with the Member's duties, as well as the cost of telephone calls, courier charges, faxes and telexes: a receipt shall be required for each item in excess of five percent of the daily fee referred to in sub-paragraph (b) of this Clause;
- (d) any taxes properly levied in the Country on payments made to the Member (unless a national or permanent resident of the Country) under this Clause 6.

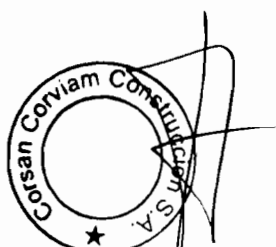
The retainer and daily fees shall be as specified in the Dispute Board Agreement. Unless it specifies otherwise, these fees shall remain fixed for the first 24 calendar months, and shall thereafter be adjusted by agreement between the Employer, the Contractor and the Member, at each anniversary of the date on which the Dispute Board Agreement became effective.

If the parties fail to agree on the retainer fee or the daily fee, the appointing entity or official named in the Contract Data shall determine the amount of the fees to be used.

The Member shall submit invoices for payment of the monthly retainer and air fares quarterly in advance. Invoices for other expenses and for daily fees shall be submitted following the conclusion of a site visit or hearing. All invoices shall be accompanied by a brief description of activities performed during the relevant period and shall be addressed to the Contractor.

The Contractor shall pay each of the Member's invoices in full within 56 calendar days after receiving each invoice and shall apply to the Employer (in the Statements under the Contract) for reimbursement of one-half of the amounts of these invoices. The Employer shall then pay the Contractor in accordance with the Contract.

If the Contractor fails to pay to the Member the amount to which he/she is entitled under the Dispute Board Agreement, the Employer shall pay the amount due to the Member and any other amount which may be required to maintain the operation of the DB; and without prejudice to the Employer's rights or remedies. In addition to all other rights arising from this default, the Employer shall be entitled to reimbursement of all sums paid in excess of one-



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half of these payments, plus all costs of recovering these sums and financing charges calculated at the rate specified in Sub-Clause 14.8 of the Conditions of Contract.

If the Member does not receive payment of the amount due within 70 days after submitting a valid invoice, the Member may (i) suspend his/her services (without notice) until the payment is received, and/or (ii) resign his/her appointment by giving notice under Clause 7.

## 7. Termination

At any time: (i) the Employer and the Contractor may jointly terminate the Dispute Board Agreement by giving 42 days' notice to the Member; or (ii) the Member may resign as provided for in Clause 2.

If the Member fails to comply with the Dispute Board Agreement, the Employer and the Contractor may, without prejudice to their other rights, terminate it by notice to the Member. The notice shall take effect when received by the Member.

If the Employer or the Contractor fails to comply with the Dispute Board Agreement, the Member may, without prejudice to his other rights, terminate it by notice to the Employer and the Contractor. The notice shall take effect when received by them both.

Any such notice, resignation and termination shall be final and binding on the Employer, the Contractor and the Member. However, a notice by the Employer or the Contractor, but not by both, shall be of no effect.

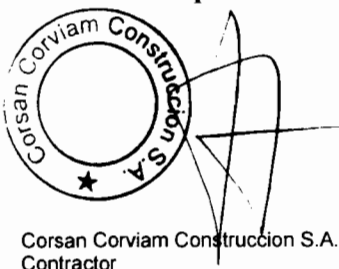
## 8. Default of the Member

If the Member fails to comply with any of his obligations under Clause 4 (a) - (d) above, he shall not be entitled to any fees or expenses hereunder and shall, without prejudice to their other rights, reimburse each of the Employer and the Contractor for any fees and expenses received by the Member and the Other Members (if any), for proceedings or decisions (if any) of the DB which are rendered void or ineffective by the said failure to comply.


If the Member fails to comply with any of his obligations under Clause 4 (e) - (k) above, he shall not be entitled to any fees or expenses hereunder from the date and to the extent of the non-compliance and shall, without prejudice to their other rights, reimburse each of the Employer and the Contractor for any fees and expenses already received by the Member, for proceedings or decisions (if any) of the DB which are rendered void or ineffective by the said failure to comply.

## 9. Disputes

Any dispute or claim arising out of or in connection with this Dispute Board Agreement, or the breach, termination or invalidity

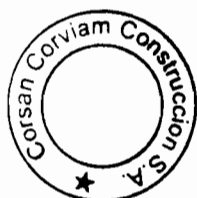


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thereof, shall be finally settled by institutional arbitration. If no other arbitration institute is agreed, the arbitration shall be conducted under the Rules of Arbitration of the International Chamber of Commerce by one arbitrator appointed in accordance with these Rules of Arbitration.



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## PROCEDURAL RULES

Unless otherwise agreed by the Employer and the Contractor, the DB shall visit the site at intervals of not more than 140 days, including times of critical construction events, at the request of either the Employer or the Contractor. Unless otherwise agreed by the Employer, the Contractor and the DB, the period between consecutive visits shall not be less than 70 days, except as required to convene a hearing as described below.

The timing of and agenda for each site visit shall be as agreed jointly by the DB, the Employer and the Contractor, or in the absence of agreement, shall be decided by the DB. The purpose of site visits is to enable the DB to become and remain acquainted with the progress of the Works and of any actual or potential problems or claims, and, as far as reasonable, to endeavour to prevent potential problems or claims from becoming disputes.

Site visits shall be attended by the Employer, the Contractor and the Engineer and shall be co-ordinated by the Employer in co-operation with the Contractor. The Employer shall ensure the provision of appropriate conference facilities and secretarial and copying services. At the conclusion of each site visit and before leaving the site, the DB shall prepare a report on its activities during the visit and shall send copies to the Employer and the Contractor.

The Employer and the Contractor shall furnish to the DB one copy of all documents which the DB may request, including Contract documents, progress reports, variation instructions, certificates and other documents pertinent to the performance of the Contract. All communications between the DB and the Employer or the Contractor shall be copied to the other Party. If the DB comprises three persons, the Employer and the Contractor shall send copies of these requested documents and these communications to each of these persons.

If any dispute is referred to the DB in accordance with Sub-Clause 20.4 of the Conditions of Contract, the DB shall proceed in accordance with Sub-Clause 20.4 and these Rules. Subject to the time allowed to give notice of a decision and other relevant factors, the DB shall:

- (a) act fairly and impartially as between the Employer and the Contractor, giving each of them a reasonable opportunity of putting his case and responding to the other's case, and
- (b) adopt procedures suitable to the dispute, avoiding unnecessary delay or expense.

The DB may conduct a hearing on the dispute, in which event it will decide on the date and place for the hearing and may request that written documentation and arguments from the Employer and the Contractor be presented to it prior to or at the hearing.

Except as otherwise agreed in writing by the Employer and the Contractor, the DB shall have power to adopt an inquisitorial procedure, to refuse admission to hearings or audience at hearings to any persons other than representatives of the Employer, the Contractor and the Engineer, and to proceed in the absence of any party who the DB is satisfied received notice of the hearing; but shall have discretion to decide whether and to what extent this power may be exercised.

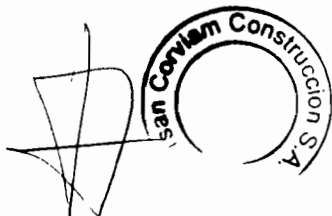


The Employer and the Contractor empower the DB, among other things, to:

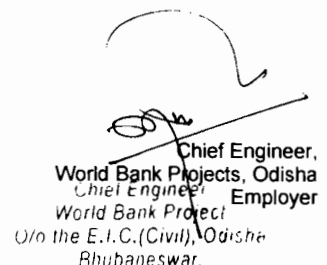
- (a) establish the procedure to be applied in deciding a dispute,
- (b) decide upon the DB's own jurisdiction, and as to the scope of any dispute referred to it,
- (c) conduct any hearing as it thinks fit, not being bound by any rules or procedures other than those contained in the Contract and these Rules,
- (d) take the initiative in ascertaining the facts and matters required for a decision,
- (e) make use of its own specialist knowledge, if any,
- (f) decide upon the payment of financing charges in accordance with the Contract,
- (g) decide upon any provisional relief such as interim or conservatory measures, and
- (h) open up, review and revise any certificate, decision, determination, instruction, opinion or valuation of the Engineer, relevant to the dispute.

The DB shall not express any opinions during any hearing concerning the merits of any arguments advanced by the Parties. Thereafter, the DB shall make and give its decision in accordance with Sub-Clause 20.4, or as otherwise agreed by the Employer and the Contractor in writing. If the DB comprises three persons:

- (a) it shall convene in private after a hearing, in order to have discussions and prepare its decision;
- (b) it shall endeavour to reach a unanimous decision: if this proves impossible the applicable decision shall be made by a majority of the Members, who may require the minority Member to prepare a written report for submission to the Employer and the Contractor; and
- (c) if a Member fails to attend a meeting or hearing, or to fulfil any required function, the other two Members may nevertheless proceed to make a decision, unless:
  - (i) either the Employer or the Contractor does not agree that they do so, or
  - (ii) the absent Member is the chairman and he/she instructs the other Members not to make a decision.



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GOVERNMENT OF ODISHA  
WORKS DEPARTMENT

CIVIL WORKS CONTRACT

**PACKAGE No. OSRP-Bal-P02**

*For*

Construction for Widening & Strengthening of Existing Carriageway  
to 2-Lane for Chandbali-Bhadrak-Anandpur Road  
(Km.0/000to Km.45/000 of SH-9 & Km.0/0 to Km.43/0 of SH-53)  
(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 CORSAN CORVIAM CONSTRUCCION S.A,**

India Office: 2nd Floor, Blok Two, Vatika Business Park,  
Sector-49, Sohna Road, Gurgaon-122001, Haryana (India)

Tel. No.:(+91) 124 4823 200, Fax: (+91) 124 4823 210

**[VOLUME-III: Specifications]**

**Agreement Value: Rs. 248,12,19,385**

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

September 27, 2013



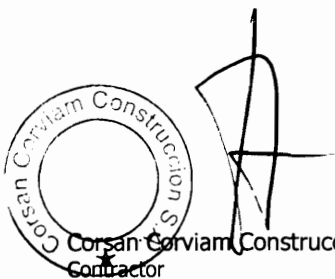


**CONTENTS of CONTRACT**

<b>Volume – I</b>	:	Letter of Acceptance, Letter of Bid and Addenda
<b>Volume – II</b>	:	Particular Conditions and the General Conditions;
<b>Volume – III</b>	:	Specifications
<b>Volume – IV</b>	:	Drawings
<b>Volume – V</b>	:	Completed Schedules,

**CONTENTS of VOLUME III**

**SPECIFICATIONS**

  
Corsan Corviam Construccion S.A  
Contractor

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

**1.2.6** The Section 1501 of SPECIFICATIONS FOR RURAL ROADS -2004, developed by “MINISTRY OF RURAL DEVELOPMENT (MORD)” has been adopted in place of Sub-section 602 of “SPECIFICATIONS FOR ROAD AND BRIDGE WORKS” referred to in PART - I.



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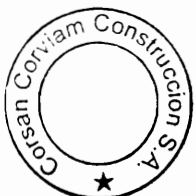
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**1.2.7** In the absence of any definite provisions on any particular issue in the aforesaid Specifications, reference may be made to the latest codes and specifications of IRC and IS in that order. Where even these are silent, the construction and 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**

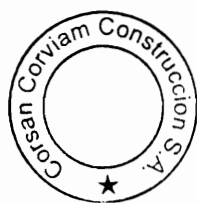


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## PART – I

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.



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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 Management Plan (QMP).

The QMP shall provide input to the overall project management plan and shall include quality control, quality assurance, and continuous process improvement approaches for the project. The QMP 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 QMP shall provide input to the overall project management plan and shall include Quality Control Checklists, Quality Assurance Plan, and continuous process improvement approaches for the project. The QMP shall be reviewed by the Engineer to ensure that decisions are



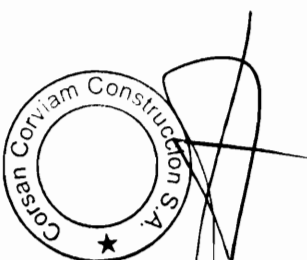
based on accurate information and to assure reduction of cost and schedule overruns caused by *rework*. The Contractor's Quality Assurance Plan describes the methods and procedures which the Contractor will apply for the execution of the Contract, including how the contractor will:

- (a) identify the quality requirements specific to the contract,
- (b) plan and execute the work to satisfy those requirements
- (c) inspect and/or test the work to ensure compliance with the quality requirements
- (d) ensure strict document control and structured filing of contract administration documents
- (e) record and monitor the results as evidence of compliance
- (f) monitor the material supply and delivery processes;
- (g) ensure the ability to trace materials incorporated in the works;
- (h) undertake testing and measurement requirements;
- (i) provide evidence of testing apparatus being recently calibrated;
- (j) demonstrate manufacturer's specification confirming compliance of materials;
- (k) record of required testing, measurement and design sheets;
- (l) document all non-conformances and ensure that prompt action is taken to correct non-compliance.

The Contractor's Quality Management Plan must clearly describe the systems, procedures and methods that will be used to deliver and monitor compliance of the Services.

The QMP shall also cover subjects listed below:

- Organization and Management Responsibility
- Document and data control
- Construction programme
- Method statements
- 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



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The general procedures of the QMP 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 QMP shall be submitted successively to the effect that it shall have been approved prior to the commencement of the activities to which the program 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**

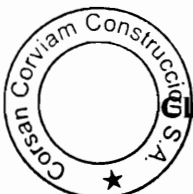
Contractor shall ensure that the design and drawings for the bridges and Road Over Bridge are vetted by Engineer through the Employer.

**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 less than 21 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.

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.

**Setting Out**



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**Clause 109**

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**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.

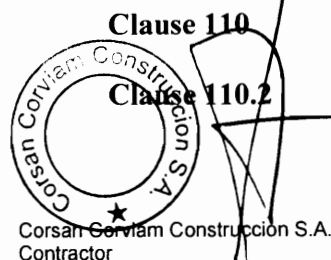
- i) Precision automatic level with micrometer attachment with tripods and leveling staff reading to 5mm accuracy by direct observation and to 1mm accuracy by estimation or better.
- ii) Total station with 2 spare batteries, charger, tripod, data capturing prisms sufficient for a 1km. range, electronic data recorder, data packs and all necessary software for operation.
- iii) 3 meter straight edge and measuring wedge fitted with handles wedges 100 mm ht. and 1 mm accuracy.
- 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 equipment in good condition during the full duration of works and replace the ones, which get worn out otherwise become unworkable.

The surveying equipment 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.”

**Public Utilities****Revise the clause as under**

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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.

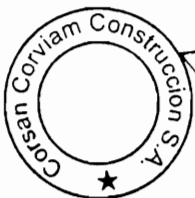
On completion of the Works, all areas disturbed by the Contractor's construction activities shall be restored in their original condition, or as per the plan agreed prior to commencement of construction activities.

The cost of this work shall be deemed to be included in the rates, unless specifically mentioned in the contract.

**Clause 111.2 Borrow pits for Embankment Construction**

**The clause shall be read as follows**

Borrow pits shall not be dug within the Right-of-Way of the road. The contractor will submit a borrow area management plan before opening up any borrow 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 borrow 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.

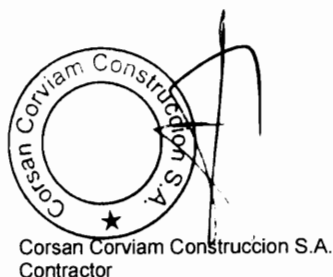
The cost of such safety and rehabilitation work shall be deemed to be included in the rates, unless specifically mentioned in the contract. Failure to adhere to the Environmental Mitigation Measures during construction will attract penalty as mentioned in the Contract data serial no. 37(c).

### Clause 111.5

#### Pollution from Hot Mix Plants and Batching Plants

**Add the following paragraph at the end of this Sub-clause.**

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).



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**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 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**

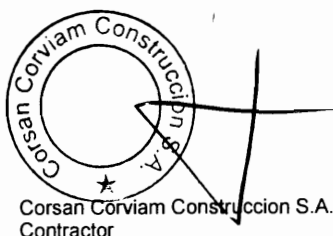
“One week before undertaking work which would involve any obstruction whatsoever to traffic, the Contractor shall submit, for the Engineer's approval, a Traffic Control Plan.

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.

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**

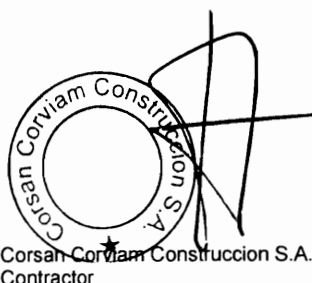
If the existing road is used as diversion, then contractor will maintain it at his cost only.

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 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



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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.

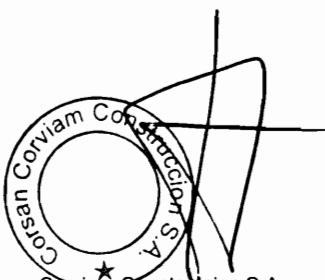
The work of providing earth embankment, sub-grade and granular sub-base material so carried out shall be paid under relevant items of bill of quantities. It may be ensured to provide minimum availability of width of 4.0m for plying of vehicles. At the end of diversion, a suitable link with proper gradient 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 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



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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.

## 2. Traffic Safety Arrangements

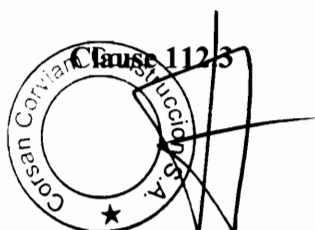
The Contractor shall provide, fix in place & position adequate warning signs, speed breakers, barriers, marker posts etc., as per IRC: SP 55 - 2001 as well as other stipulations given in clause 112.4 to ensure safety of the traffic **at each part road location** as per the following table and maintain 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 signage after completion of works.

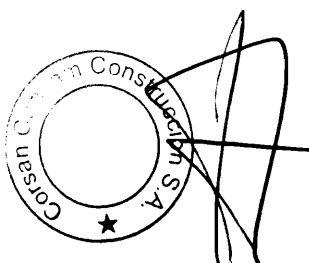
### Passage of Traffic along a Temporary Diversion

Replace the clause with following



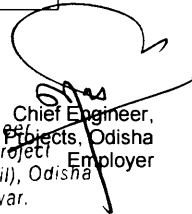
Temporary diversion to carry traffic, either at the site of cross drainage structures which are to be replaced or at any other locations, shall comply with the following:

- 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 200mm granular sub-base as per clause 401, 225mm 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 in 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.



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Sl. No	Item	Quantity
1.	Sign boards as per Technical Specifications	



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Employer  
O/o the E.I.C.(Civil), Odisha  
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	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)	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 jams during construction, measures shall be taken to relieve the congestion.

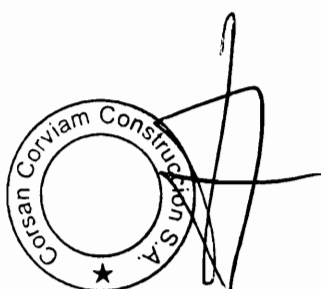
##### Add the following sub-clauses under 112.4

#### 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, a grader blade shall have a fluorescent red marker attached to the outer end of the projection. During poor light conditions



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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**

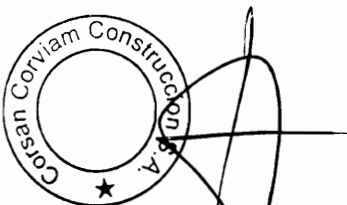
**Delete this Clause and replace with**

“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 software) in a form, 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 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



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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**

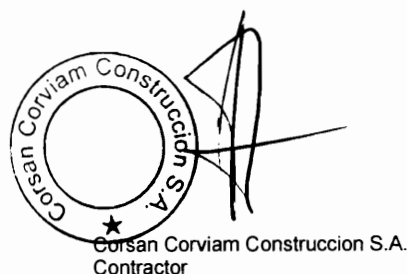
**Methodology and Sequence of Work**

**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

- a) Sources of materials like coarse aggregate and fine aggregate, quantity and quality of materials available in different sources.
- b) 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.
- c) Location of site accommodation facilities, batching plant, hot mix plant, aggregate processing plant, WMM plant, field laboratory.
- d) Details of facilities/approaches for transportation of men, equipment and materials like concrete for construction of pavements, foundations and substructure in river bed.
- e) Information on procedures to be adopted by the contractor for prevention and mitigation of negative environmental impact due to construction activities.



- f) 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. Program 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

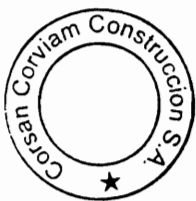
- i) Details of personnel both for execution and quality control of the work.
- ii) Equipment deployment with details of number of units, capacity, standby arrangements.
- iii) Sequence of construction, details of temporary or enabling work like diversions, cofferdams, formwork including specialized formwork for superstructure, details of borrow 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.

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 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.
- iii) Details of product development and development testing
- iv) Acceptance test and criteria  
Manufacturer shall submit the quality assurance procedure. Details of acceptance test and criteria of acceptance shall be furnished in this document.
- v) Installation procedure& demonstration
- vi) Maintenance procedure and schedule
- vii) 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.

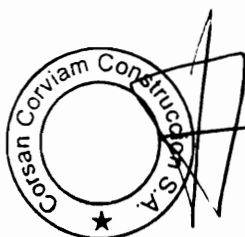
### Clause 121.2

#### 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.

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:

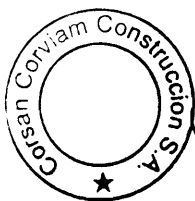
#### A.

#### General

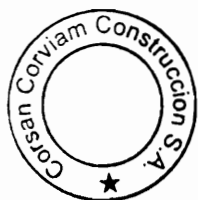
#### i)

#### Balance

- |    |  |        |
|----|--|--------|
| a) | 10 kg capacity semi-self indicating type – Accuracy 1 gm |        |
|    | Electronic   | 1 No.  |
|    | Mechanical   | 1 No.  |
| b) | 500 gm capacity – Accuracy 0.01 gm                       |        |
|    | Electronic   | 1 No.  |
|    | 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. |



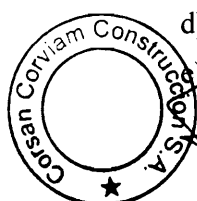
- ii) Oven-electrically operated, thermostatically controlled (including thermometer), stainless steel interior
- a) Temperature range ambient to 300° C, Sensitivity 1° C, capacity 120 Litre. 1 No.
- b) Temperature range, ambient to 150° C, sensitivity 1° C, capacity 250 Litre. 1 No.
- iii) Sieves : 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.
- 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**

<b>i) Liquid limit and plastic limit</b>		
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.
<b>ii) Hydrometer analysis</b>		
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
<b>iv) Laboratories compaction</b>		
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.
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.
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.
	Marshall compaction apparatus and complete with electrically operated automatic loading unit, compaction pedestal, heating unit, head breaking	1 Set

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)

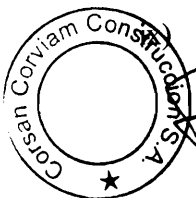
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|-------|---|--------|
| vi)   | Digital type thermometer reading 0-300° C range, accuracy 2° C                        | 2 Nos. |
| viii) | Ring and Ball Apparatus as per IS 1205 - 1978   | 1 Set  |
| x)    | Tar Viscometer IS 1206 (Part III) – 1978  | 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                                  | 1Set    |
| 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.   |
| 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.  |
|       | 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      |


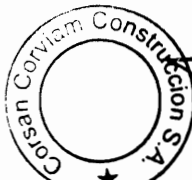
**Clause 121.3.6 Add New Sub-Clause:**

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.”

  
  
 Corsan Condam Construction S.A.  
 Contractor

**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 compact 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 1<sup>st</sup> 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 films 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**

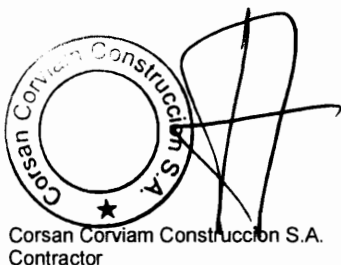
**SECTION 200 SITE CLEARANCE**

**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**

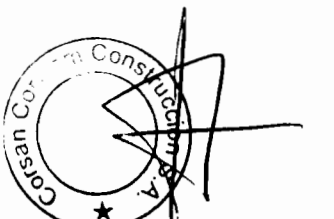
These will also include removal of stumps of trees of any girth left after cutting of trees carried out by any agency, removal of sign boards, hoarding boards, concrete post, km stones including their foundation, excavation and back filling to required density, where necessary and handling, salvaging and piling and disposing of the cleared materials with all lifts and up to all lead.

**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.”



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**Clause 202.7 Rates****Add the following at the end of the para**

“The cost of cartage of materials with no salvage value to disposal sites with all leads 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**

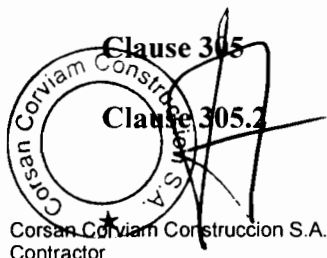
Unsuitable and Surplus material which in the opinion of the Engineer cannot be used in the works, shall be removed from site by the Contractor and disposed of at the nearest pit or other approved disposal location **with all lead and lifts** in accordance with all statutory requirements.”

**Clause 301.8 Delete item (v) of last para and replace with:**

(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.”

**Embankment Construction****Materials and General Requirements**

**Clause 305.2.1 Physical requirements****Clause 305.2.1.5 Add the following at the end of first sentence**

In addition, the material shall satisfy the requirement of 4 day soaked design **CBR of 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 Borrow materials****The first Para graph of this clause shall be read as under**

“No borrow area shall be made available by the Employer for this work and Borrow 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 borrow 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 borrow area selected by the contractor shall be removed and preserved for use on embankment slopes and/ or rehabilitation of burrow area. The top soil shall not be permitted to be used in the embankment layers.*

Care shall be taken not to create any low lying area; if any borrow pit is created, the same shall be filled up with pond/ fly ash/ inert slag covered with 0.5m thick soil wherever technically feasible. No part of the borrow area shall be left uncovered to expose scar marks. In all cases the top soil shall be placed over the borrow area and watered for three days. The Table 300-2 shall be read as under

**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,”

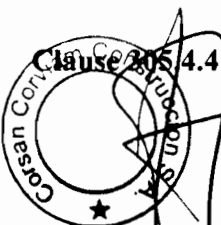
### Clause 305.4.3 Earth work over existing road surface

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.

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 borrow 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.



### 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.

**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.”

**Rates**

**This Clause shall be deleted**



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**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:

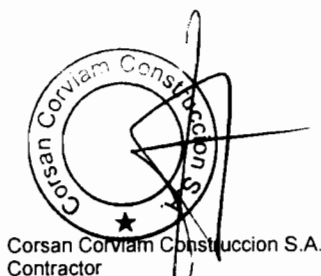
Soundness test shall be carried out in accordance with IS : 2386 (Part-5). The average loss of weight of coarse aggregate after 5 cycles shall not exceed 12% when tested with sodium sulphate and 18% when tested with magnesium sulphate as specified in IS: 383.

**Clause 406.3. CONSTRUCTION OPERATIONS****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 2<sup>nd</sup> 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 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**

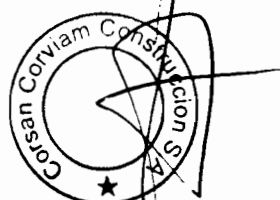
**Add as follows after para 4**

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/m<sup>2</sup>.

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 10<sup>0</sup>C.

**Clause 502.4 Construction**

**Clause 502.4.1 Equipment**

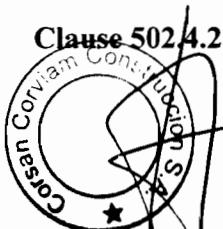
**Replace the clause as follows**

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 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 10<sup>0</sup>C.

#### **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.

#### **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 conforming 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/m<sup>2</sup>.

**Clause 503.4.4 Curing the tack coat**

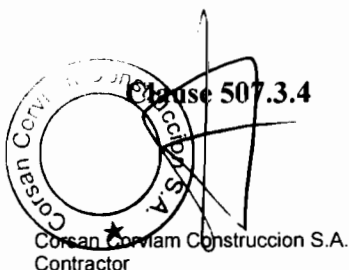
**Replace the clause as follows**

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.

**Clause 503.8 Rate**

Replace 0.2 kg /m<sup>2</sup>. with 0.30 kg/m<sup>2</sup> in fourth line.

Add the following line at the end of the clause.



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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 2<sup>nd</sup> line of this para.

Where modified bitumen is specified to be used as a binder shall have a softening point not less than 60<sup>0</sup> 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

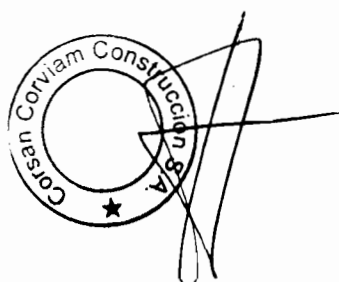
**Clause 601.5.2** Batching and Mixing

Add as new sub-clause

**Clause 601.5.2.1** Semi-Mechanised and Labour-Oriented Construction Technique

**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 601.5.3.1.2. Plants, equipments and tools:**

The plants and equipments considered essential even in semi-mechanized and labour-oriented constructions are:

- i. Tilting type drum 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.)
- ii. Vibratory or smooth wheeled roller of 8-10t capacity
- iii. Fixed side forms measuring at least 100-150 m length.
- iv. Stop-end and start-end made of steel or wooden sections.

**Clause 602. CEMENT CONCRETE PAVEMENT**

Replace this Clause with Technical Specifications provided under Sub-section 1501 (Plain Cement Concrete Pavement) of Specifications for Rural Roads-2004 developed by MORD.

**SECTION 800 TRAFFIC SIGNS, MARKING & OTHER ROADS APPURTENANCES**

**Clause 801 Traffic Signs**

**Clause 801.1.2. This Clause shall be read as under**

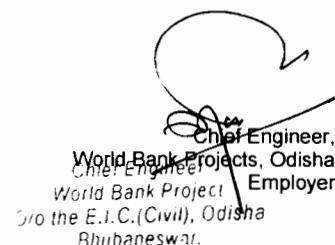
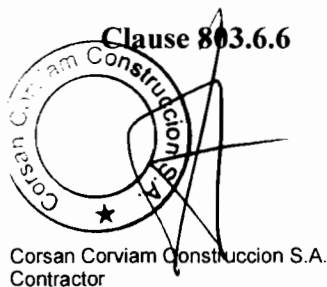
"All road signs shall be of retro-reflectorised type with super high-intensity retro-reflective sheeting. The sheeting is typically unmetallised micro-prismatic retro-reflective element material or any other type as approved by the Engineer.

**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 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**

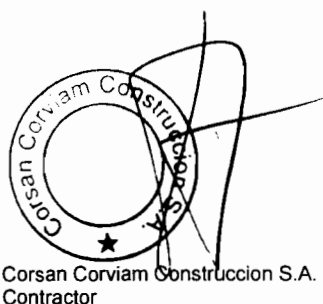
#### **Clause 903.4**

#### **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**



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

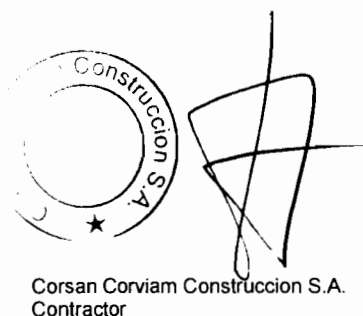
Reduction in Core Density	Deduction in the payable rate
-Upto 1.00% from the required percentage	@ 5%
- Between 1.01% to 2.00% from the required percentage	@15%
- Between 2.01% to 3.00% from the required percentage	@30%
-By more than 3.01% from the required percentage	@ 100%. Such works shall be rejected and NIL payment shall be made

The minimum deduction in the payable rate shall be made for 250 Sqm for each failure.

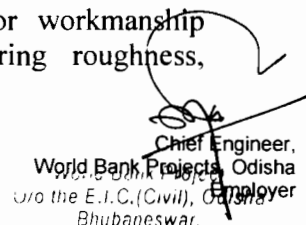
**c) Workmanship Test: Roughness measured longitudinally**

Calibration of equipments and measurement of surface unevenness shall be done in accordance with IRC:SP:16-2004.

The finished bituminous layers shall be tested for workmanship (immediately before allowing traffic) by measuring roughness,



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longitudinally separately for each lane with the Calibrated Towed Fifth Wheel Bump Integrator. The measured roughness shall not exceed a value of 2000 mm/km for finished Bituminous Concrete and Concrete surfaces.

Any completed layer (concrete or BC) having roughness in excess of the value 2000 mm/km shall be paid in accordance with the Deduction Formulae as specified below:

Measured Roughness	Deduction in the payable rate
- Upto 5.00% more than the requirement	Nil
-More than 5.01% and upto 30.00% more than the requirement	@ (10%+1% for every 1% in excess of 5%)
-More than 30% more than the requirement	Work shall be rejected. Complete re-work shall be done.

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 2000 m<sup>2</sup>.

## 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

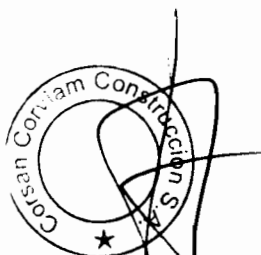
### Clause 1009.3 Add the following note under table 1000-3

Thermo Mechanically Treated bars (TMT bars) of grade Fe-500 from original manufacturers such as SAIL/ TATA/ RINL/ JINDAL conforming to IS: 1786 shall 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 1000 mg/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 be obtained and preserved for comparison for acceptance of the production lots.

Re-trials 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).

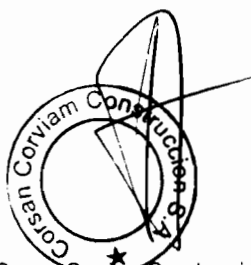
Manufacturer's experts should be available for consultation / trouble shooting of problems associated with their product. The conditions of storage, shelf life etc. as specified by the manufacturer should be strictly observed. The manufacturer's Quality Assurance Plan during process of production should 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.



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**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."

**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**

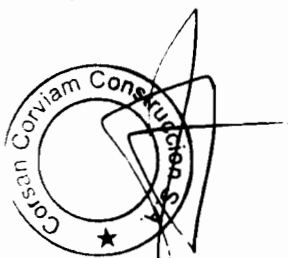
**Add the following at the end of the first para**

“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.**

In pre-stressed concrete members, when welding of un-tensioned reinforcement is permitted by the Engineer, it shall be carried out before insertion of the pre-stressing 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.

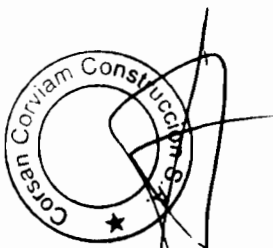
Grading of aggregate shall be continuous and shall have sufficient ultra fine materials (materials finer than 0.25 mm). Proportion of the aggregate passing through 0.25 mm shall be between 15 and 30% and that passing through 0.125 mm sieve shall not be less than 5% of the total volume of aggregate. Admixtures to increase workability can be added. When pumping long distances and in hot weather set retarding admixtures can be used. 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. The concrete shall be transported in transit mixers taking precaution that the initial setting time of the cement is maintained. In case of far off locations, retarders shall be added to delay the



initial setting time. The concrete shall be pumped to the location of pouring from the transit mixer point using concrete pumps of suitable capacity and efficiency.”

## **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 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**

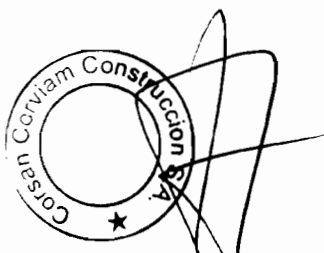
Paper bearing shall be reinforced bitumen laminated Kraft paper conforming to the requirements of IS- 1398.

## **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.”

**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 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.

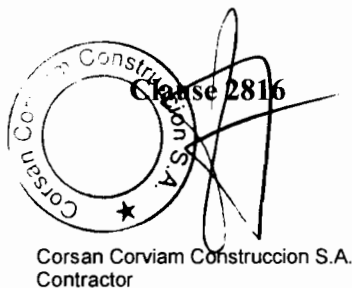
Holes shall be drilled vertically using rotary drill machines. Care shall be taken that the holes are drilled vertical and the deck concrete is not damaged. It shall be ensured that buried reinforcement of the deck is not damaged due to drilling by avoiding locations above reinforcement. Rebar detector 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

**Railing / Parapets**



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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.

#### **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 confirm 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.

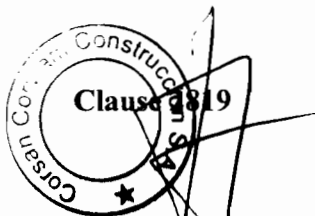
The work shall be done after the wearing coat is removed. The existing spouts shall be removed carefully with minimum damage to surrounding concrete. The pocket formed shall be sufficiently large to ensure good flow and compaction of concrete around the new spout. The area around the spout covering the 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 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**

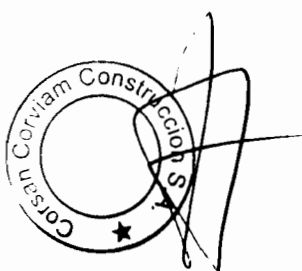
The polymer latex, which is to be used, should consist of water based acrylic polymer and copolymer dispersion and special purpose chemicals. The polymer solid contents shall be  $30 \pm 1$  percent. The particle shall be of nearly spherical shape with a diameter of  $0.35 \pm 0.05$  micrometer. The 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

**I. Mix Formulations**

<u>PMC SLURRY</u>	
COMPONENT	PARTS BY WEIGHT
Cement	100
Acrylic polymer latex	52

<u>PMC REPAIR MORTAR</u>	
COMPONENT	PARTS BY WEIGHT
Cement	100
Acrylic polymer latex	52
Coarse Silica Sand	150
Fine Silica Sand	150

**Curing of PMC WORK**

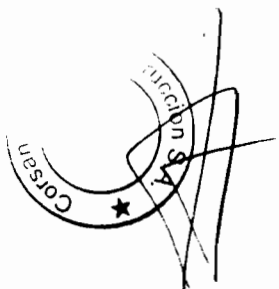
This specification describes the curing procedures to be followed for PMC Repair Mortar & Slurry

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 350C

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 as 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.

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.

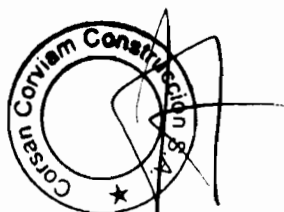
Mix for about 5 minutes until solids have been well dispersed. The resulting mix should look uniform, feel creamy and be free from lumps and grits.

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 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.

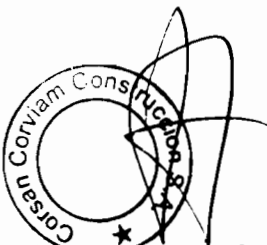
In unexposed and exposed areas the initial air drying of 4 to 6 hours shall be followed by moist curing for 24 hours by spraying or another approved curing method.

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.

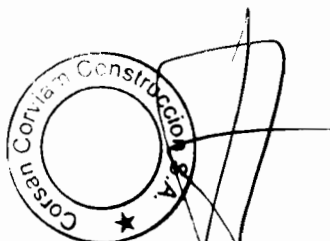
Begin mechanical mixing and while doing so, slowly add the dry components, i.e. cement and sand for brush top coating.

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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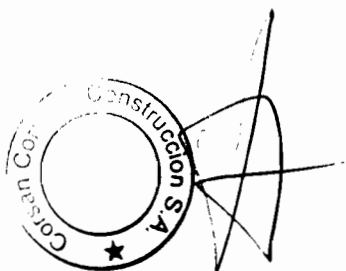
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### PART III

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## 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.



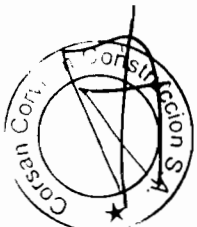
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## PART IV

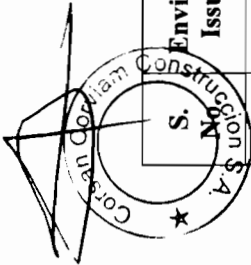
# ENVIRONMENT MANAGEMENT PLAN



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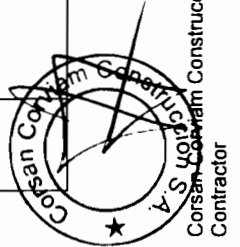
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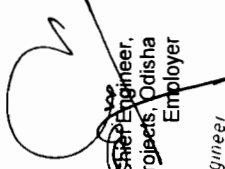
## ENVIRONMENTAL MANAGEMENT PLAN

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	<p>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.</p> <p>The Contractor shall submit the <b>proposed location plan</b> (including survey number/s of the land parcel/s under consideration, area, land-use and surrounding features) and seek <b>prior approval</b> 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.</p> <p>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.</p>
E.4 Construction Camp/s – Selection, Design and Lay-out	<p>No construction camps, including material stack yards and storage facility <b>will not be proposed within 500 mts.</b> From</p> <ol style="list-style-type: none"> <li>a. a settlement/habitation</li> <li>b. water source and</li> <li>c. reserved or protected forest limits</li> </ol>

S. No.	Environmental Issue/Aspect	Management Measures
E.5	Construction Vehicles, Equipment and Machinery	<p>to avoid conflicts and stress on the local infrastructure facilities and natural resources.</p> <p>In case the contractor proposes setting-up of plant/s within a construction camp, clause P.3 will apply.</p> <p>The Contractor shall submit the <b>proposed location plan</b> (including survey number/s of the land parcel/s under consideration, area, land-use and surrounding features) and seek <b>prior approval</b> 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.</p> <p>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>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.</p> <p>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>
E.6	Identification, Operation and Rehabilitation of Burrow Areas	<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 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</p>

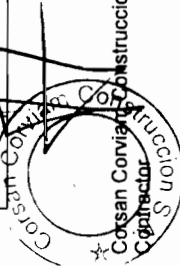


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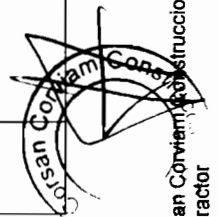
  
Sri P. Engineer,  
World Bank Projects, Odisha  
Employer

Chief Engineer  
World Bank Project  
O/o the E.I.C. P.O.

S. No.	Environmental Issue/Aspect	Management Measures
		<p>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>
E.7	Identification, Operation and Rehabilitation of Stone Quarry	<p>The Contractor shall submit the <b>proposed location plan</b> (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 <b>prior approval</b> 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 District Administration, SPCCB and local Tehsildar and submit a copy of the same to the Engineer. All quarry operations, including procurement, storage and use of blasting material/s will be undertaken within the rules and regulations in vogue.</p>
E.8	Identification, and Operation of Sand Quarry	<p>The Contractor shall submit the <b>proposed location plan</b> (including details of the site/s under consideration, proposed quantum of material extraction and surrounding features) and seek <b>prior approval</b> 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</p>


  
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<b>Management Measures</b>	
<b>S. No.</b>	<b>Environmental Issue/Aspect</b>
E.9	Arrangement for Construction Water
<p>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>The Contractor shall submit the <b>proposed location plan</b> (including site details; type of the source under consideration; its usage by other consumers; proposed quantum of water extraction) and seek <b>prior approval</b> 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>	
E.10	Clearing and Grubbing
<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>	
E.11	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> <ol style="list-style-type: none"> <li>Stockpile will be such that the slope does not exceed 1:2 (vertical to horizontal), and height is restricted to 2 m.</li> <li>To retain soil and to allow percolation of water, the edges of the pile will be protected by silt fence.</li> <li>Multiple handling kept to a minimum to ensure that no compaction occurs.</li> <li>Such stockpiles shall be covered with empty gunny bags or will be planted with grasses to prevent loss during rains.</li> </ol> <p>Such stockpiled topsoil will be utilized for -</p>	



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S. No.	Environmental Issue/Aspect	Management Measures
E.12	<b>Labour Camp Management</b>	
12.1	Accommodation	<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 only after the written approval from the Engineer has been received by the Contractor.</p>
12.2	Potable Water	<p>The Contractor shall ensure the fulfillment of the following conditions:</p> <ul style="list-style-type: none"> <li>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.</li> <li>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.</li> </ul> <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>
12.3	Sanitation and Sewage System	<p>The Contractor shall ensure that -</p> <ul style="list-style-type: none"> <li>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.</li> <li>d) Separate toilets and bathrooms for women workers wherever required, screened from those of men, are provided with markings in vernacular language.</li> <li>e) All such facilities must have adequate water supply with proper drainage and disposal facility.</li> </ul> <p>All toilets in workplaces are to be maintained, cleaned and disinfected daily using proper disinfectants.</p>

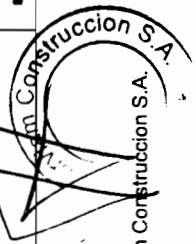


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Contractor

*(Signature)*  
Chief Engineer,  
World Bank Projects Employer  
The E.I.C. (Civil), Odisha.  
Bhubaneswar.


S. No.	Environmental Issue/Aspect	Management Measures
E. 13	Transportation of Construction Materials and Haul Road Management	<p>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.</p> <p>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> <p>All these facilities shall be inspected on a weekly basis by the Engineer to check the hygiene standards.</p> <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> <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	Traffic Diversions	This shall be done according to the provisions of Technical Specifications Cl. 112.
14.2	Traffic Safety	This shall be done according to the provisions of Technical Specifications Cl. 112
14.3	Safety of Workers	<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.</p> <p>The Contractor will comply with all the precautions as required for ensuring the safety of the workmen as per the International Labour 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> <p>a) Protective footwear and protective goggles to all workers employed handling asphalt materials, cement, mortar, concrete,</p>

S. No.	Environmental Issue/Aspect	Management Measures
14.4	Risk from Electrical Equipment(s)	<p>blasting and crusher operations.</p> <p>b) Welder's protective eye-shields and protective footwear to workers engaged in welding works.</p> <p>c) Earplugs to workers exposed to high noise levels.</p> <p>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.</p> <p>e) Protective goggles and clothing to workers engaged in stone breaking activities.</p> <p>f) Nettings below and on the sides of overhead construction and excavation work to prevent mishaps due to accidental fall of workmen and debris.</p> <p>g) 'No smoking' and other 'high risk' areas are to be provided with warning signage besides strict enforcement of PPE with zero tolerance limits.</p> <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> <p>a) 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.</p> <p>b) 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.</p> <p>c) 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.</p> <p>d) The contractor shall ensure proper maintenance of electrical supply lines/points.</p> <p>e) All such electrical operating units shall be switched off before operations are closed every day or night as the case may be.</p> <p>f) All electrical equipment/cables/wires to be used in the construction shall have to conform to the relevant BIS specifications/codes.</p> <p>g) 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.</p>
14.5	First Aid	<p>The Contractor shall arrange for -</p> <ul style="list-style-type: none"> <li>▪ 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.</li> <li>▪ Availability of suitable transport at all times to take injured or sick person(s) to the nearest hospital.</li> <li>▪ Equipment and trained nursing /paramedical staff at construction camps.</li> </ul>



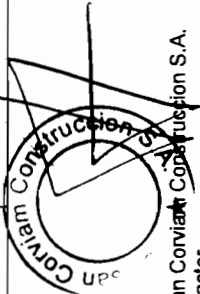
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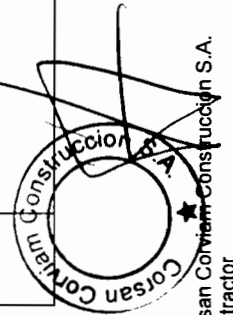
  
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World Bank Projects, Odisha  
Employer  
Chief Engineer  
World Bank Project  
U/o the E.I.C.(Civil), Odisha  
Bhubaneswar.




S. No.	Environmental Issue/Aspect	Management Measures
14.6	Risk Force Majeure	<ul style="list-style-type: none"> <li>■ Periodic health checks for workers.</li> </ul> <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 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>

  
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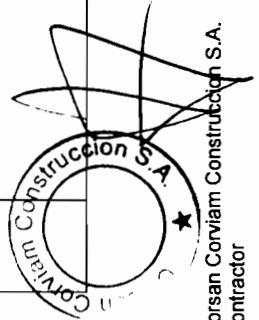
<b>Management Measures</b>	
<b>S. No.</b>	<b>Environmental Issue/Aspect</b>
E.17	Labour Requirements
The Contractor preferably will use labour drawn from local areas to provide maximum benefit to the local community especially to the vulnerable individuals/groups living in the project area.	
<b>E.18</b>	<b>Pollution Management</b>
18.1	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>	



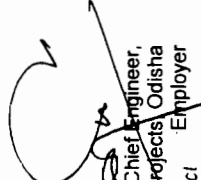
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 Chief Engineer,  
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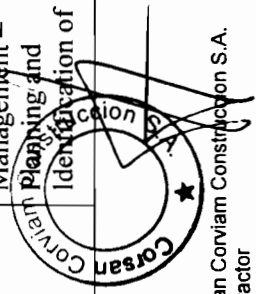
S. No.	Environmental Issue/Aspect	Management Measures
18.3	Water Pollution from Fuel, Lubricants and Chemicals	<p>Garage, service stations, refueling stations and equipment maintenance yards shall be so located at least 100 mts. away from kitchen, mess and drinking water facilities within the camp site.</p> <p>The Contractor shall ensure that all vehicles, machinery and equipment are operated (including re-fuelling) and maintained in such 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"> <li>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.</li> <li>All vehicles and equipment used in construction will be fitted with exhaust silencers.</li> <li>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.</li> <li>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.</li> <li>Construction activity at sites within 100m habitations and hospitals shall not be carried out during night (10:00 pm to 06:00 am).</li> <li>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.</li> <li>Blasting operations, if any shall be carried out with full safety precautions and in compliance with measures as specified in</li> </ol>



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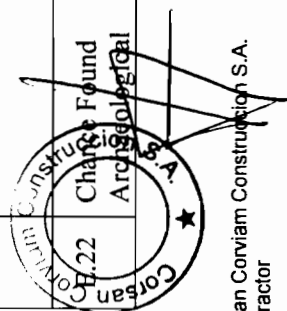
S. No.	Environmental Issue/Aspect	Management Measures
E.19	Drainage and Flood Control	<p>the legal provisions.</p> <p>Monitoring shall be carried out by the Contractor in presence of the Engineer at the construction sites as per the Noise Monitoring Plan provided in this EMP and results shall be shared with the Engineer.</p> <p>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.</p>
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"> <li>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.</li> <li>Turfing works will be taken up as soon as possible provided the season is favorable for the establishment of grass sods.</li> <li>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.</li> <li>Along sections abutting water bodies, stone pitching, as laid out in the design, will be provided to protect slopes.</li> </ol>
E.21	Waste Management	
21.1	Waste Management – Planning and Identification of	<p>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.</p>



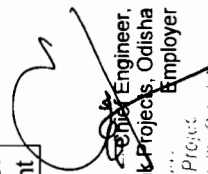
Corsan Corviam Construction S.A.  
Contractor

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

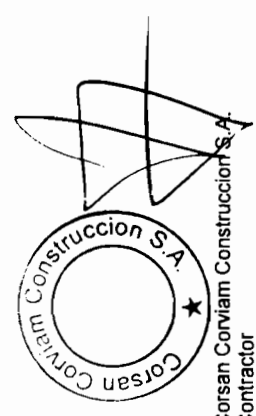
S. No.	Environmental Issue/Aspect	Management Measures
	Disposal Sites	
21.2	Re-use and Disposal of Debris Generated from Dismantling of Structures and Road Surface	<p>Debris generated due to the dismantling of the existing road will be suitably re-used in the proposed construction as follows:</p> <ul style="list-style-type: none"> <li>▪ 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.</li> <li>▪ 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.</li> <li>▪ 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.</li> <li>▪ 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.</li> <li>▪ 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.</li> </ul> <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>
21.3	Waste Disposal from Construction Camp/s and Plant Site/s	<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>
CE.22	Change Found Archaeological	<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</p>




Corsan Conviem Construction S.A.  
Contractor

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

<b>Management Measures</b>		
<b>S. No.</b>	<b>Environmental Issue/Aspect</b>	<p>legislation.</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>
E.23	Demobilization and Decommissioning	



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

## Form P1

## IDENTIFICATION OF DISPOSAL SITE LOCATIONS

[One Time Format, to be filled by the Contractor before dumping in each location]

Link : \_\_\_\_\_  
[Give chainages 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 <sup>2</sup> )			
3	Total Material that can be dumped within the site (m <sup>2</sup> )			
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 sitting 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 (Total .....no.s) : Attached / Not Attached
2. Photographs of
  - a. Each disposal location : Attached/ Not Attached
  - b. Each community consultation : Attached/ Not Attached
3. Photo copy of Agreement with individual owners
  - a. Mr. : Attached/ Not Attached
  - b. Mr. : Attached/ Not Attached

Remarks

Submitted

Signature.....

Name.....

Designation.....

Contractor

Corsan Corviam Constructor S.A.  
Contractor

Checked

Signature.....

Name.....

Environmental Engineer.  
Construction Supervision Consultant

Approved

Signature.....

Name.....

Resident Engineer

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

**SETTING-UP CONSTRUCTION CAMP AND STORAGE AREA**

[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.	<b>Detail of item camp</b>		
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.	<b>Details of topsoil stacking</b>		
a.	Quantity of top soil removed	Sq.m	
b.	Details of storage of topsoil [Describe stacking arrangement]		
3.	<b>Details of workforce</b>		
a.	Total No of Laborers	Nos	
b.	Total no of Male Workers	Nos	
c.	No of Male Workers below 18 years	Nos	
d.	Total No of Female Workers	Nos	
e.	No of Female workers below 18 years	Nos	
f.	No of children	Nos	
4.	<b>Details of dwelling units</b>		
a.	No of dwellings/huts		
b.	Minimum Size of Dwelling	m x m	
c.	No. of openings per dwelling	Nos	
d.	Minimum size of opening	m x m	
e.	Walls	Specifications	
f.	Roofing	Specifications	
	Flooring	Specifications	
	Drinking Water Tank	Specifications	
	Capacity of Drinking Water Tank	Cum	



j.	Size of Drinking Water Tank	Mxm	
k.	Total no of WC	Nos	
l.	No of Wcs for female workers	Nos	
m.	Minimum Size of WC	Mxm	
n.	Total No of Bathrooms for female workers	Nos	
o.	Size of septic tank for WC/Baths	Mxm	
p.	Capacity of Water Tank for WCs /Bathrooms and general purpose	cum	
q.	Fencing around camp	Y/N	
5.	<b>Details of facilities</b>		
a.	Availability of security 24 hrs a day	Yes/No	
b.	Details of First Aid Facility	Yes/No	
c.	Availability of Dav Care Centre	Yes/No	
d.	Availability of dust bins (capacity 60 ltr)	Nos	

Encl:

- Site Layout of Construction camp
- Drawings of dwelling units with allied facilities

Attached/ Not Attached  
Attached/ Not Attached

<b>Remarks</b>
----------------

**Submitted**

Signature.....

Name.....

Designation.....  
Contractor**Checked**

Signature.....

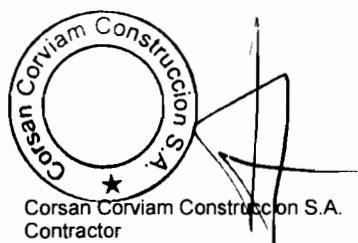
Name.....

Environmental Engineer.  
Construction Supervision Consultant**Approved**

Signature.....

Name.....

Resident Engineer



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

**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 \_\_\_\_\_

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		

- Photograph of Proposed Site                      Attached/ Not Attached
- Location Map    Attached/ Not Attached
- Agreement with Land Owner                      Attached/ Not Attached

**Submitted**

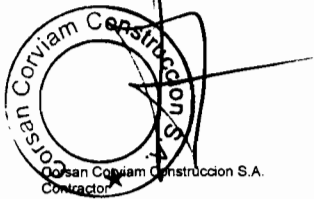
Signature.....  
 Name.....  
 Designation.....  
 Contractor

**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,  
 Bhubaneswar.

Form P4

**ESTABLISHMENT OF HOT MIX PLANT /BATCH MIX PLANT**  
[To be submitted by Contractor for taking permission from PMU]

Link \_\_\_\_\_

Sl. No.	Location				Area (m <sup>2</sup> )	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)								

- |                                |   |
|--------------------------------|---|
| 1. Photograph of Proposed Site | Attached/ Not attached                    |
| 2. Site Plan                   | Attached/ Not attached                    |
| 3. Permission from OSPCB       | Attached/ Not attached (Valid upto _____) |

**Submitted**

Signature.....

Name.....

Designation.....

**Checked**

Signature.....

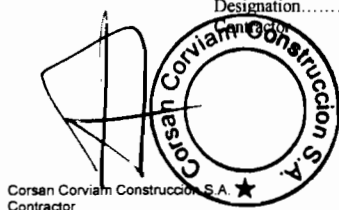
Name.....

Environmental Engineer.  
Construction Supervision Consultant**Approved**

Signature.....

Name.....

Resident Engineer

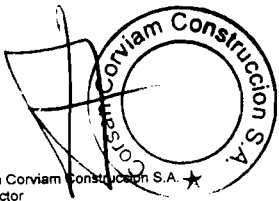


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Chief Engineer,  
World Bank Projects, Odisha  
Employer

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

*Blank*



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

**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
<b>Details of Construction Zone</b>			
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	
<b>Signage's in advance warning zone</b>			
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	
<b>Signage in Approach Transition Zone</b>			
1.	Signage saying 'Compulsory Keep Right /Left' provided	Y/N	
2.	Delineators placed along length of transition	Y/N	
<b>Signage in work zone</b>			
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	
<b>Signage in Terminal transition zone</b>			
1.	Sign for Restriction Ends	Y/N	
<b>Road Delineator</b>			
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 Attached/ Not
2. Format on Acquisition of Temporary diversions  
Attached Attached/ Not

**Submitted**

**Checked**

**Approved**

Signature.....

Signature.....

Signature.....

Name.....

Name.....

Name.....

Designation.....

Environmental Engineer.  
Construction Supervision Consultant

Resident Engineer

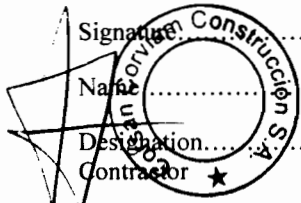
Contractor

Corsan Corviam Construcción S.A, Spain

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**EMPLOYER**

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

Corsan Corviam Construcción S.A,  
Contractor  
Odisha



**ARRANGEMENT FOR TEMPORARY LAND**  
 [Quarterly Reporting by Contractor to PMU, Site Layout of all locations to be attached with this format]

Link \_\_\_\_\_ Report – Date: \_\_\_\_\_

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 <sup>2</sup> )	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														
5	Stock Yard														
	SY 1														

**Submitted**

Signature.....

Name.....

Designation.....

Contractor

**Checked**

Signature.....

Name.....

Environmental Engineer,  
Construction Supervision Consultant

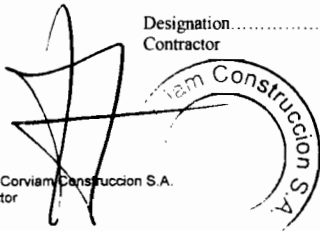
**Approved**

Signature.....

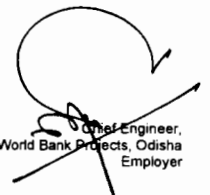
Name.....

Resident Engineer

Corsan Corviam Construccion S.A.  
Contractor



Chief Engineer,  
World Bank Projects, Odisha  
Employer



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

**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**

Signature.....

Name.....

Designation.....  
Contractor

**Checked**

Signature.....

Name.....

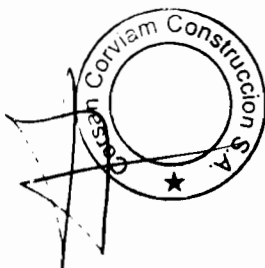
Environmental Engineer.  
Construction Supervision Consultant

**Approved**

Signature.....

Name.....

Resident Engineer



Corsan Corviam Construccion S.A.  
Contractor

Chief Engineer,  
World Bank Project: Odisha  
World Bank Employer  
O/o the E.I.C.(Civil), Odisha  
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 quality 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)	
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**  
Signature.....  
Name.....

**Checked**  
Signature.....  
Name.....

**Approved**  
Signature.....  
Name.....

  
Corsan Corviam Construction S.A.  
Contractor

  
Chief Engineer,  
World Bank Projects, Odisha  
World Bank Project Employer  
C/o the E.J.C.(Civil), Odisha  
Bhubaneswar.



Designation.....  
Contractor

Environmental Engineer.  
Construction Supervision Consultant

Resident Engineer

**Form C2**

**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**

Remarks

**Submitted**

Signature.....

Name.....

Designation.....  
Contractor

Signature.....

**Checked**

Signature.....

Name.....

Environmental Engineer.  
Construction Supervision Consultant

**Approved**

Signature.....

Name.....

Resident Engineer

**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)
	<b>I</b>				
	<b>II</b>				
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.

**Submitted**

**Checked**

**Approved**

Signature.....

Signature.....

Signature.....

Name.....

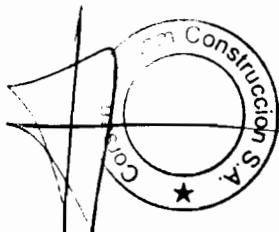
Name.....

Name.....

Designation.....  
Contractor

Environmental Engineer.  
Construction Supervision Consultant

Resident Engineer



Corsan Corviam Construction S.A.  
Contractor



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

**DETAILS OF MACHINERY IN OPERATION**

[Monthly Report , to be filled by the Contractor]

Link \_\_\_\_\_

Reporting Month.....

Date of Submission.....


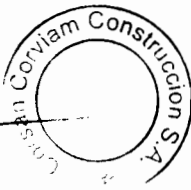
**1. Details of Machinery Operation**

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/ Not Attached

**Remarks**

<b>Submitted</b>	<b>Checked</b>	<b>Approved</b>
Signature.....	Signature.....	Signature.....
Name.....	Name.....	Name.....
Designation..... Contractor	Environmental Engineer. Construction Supervision Consultant	Resident Engineer



  
 Corsan Corviam Construction S.A.  
 Contractor


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

**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 / lit)			
5	Details of waste disposal. (Whether Sold/ Disposed)			

**Submitted**

Signature.....

Name.....

Designation.....

Contractor.....

**Checked**

Signature.....

Name.....

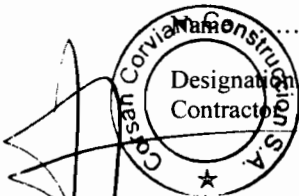
Environmental Engineer.  
 Construction Supervision Consultant

**Approved**

Signature.....

Name.....

Resident Engineer



Corsan Corvia Construction S.A.  
 Contractor

*(Signature)*  
 Chief Engineer,  
 World Bank Projects, Odisha  
 World Bank Project Employer  
 through E.I.C.(Civil), Odisha  
 Bhubaneswar.

**REDEVELOPMENT OF BURROW AREAS**  
 [Monthly Reporting Format to be filled by the Contractor]

Link \_\_\_\_\_

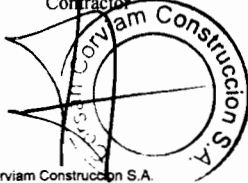
Report-Date \_\_\_\_\_

Sl. No.	Burrow Area No.	Rehabilitation Measures	Date of approval of Rehabilitation	Date of Handing Over back to the Owner	Remarks

- |   |                        |
|---|------------------------|
| 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 |

**Submitted**

Signature.....  
 Name.....  
 Designation.....  
 Contractor



Corsan Corviam Construction S.A.  
 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  
 Shubaneswar.

**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			
Wirings			
Fixed Installation			
Portable Lighting			
Portable Tool			
Welding Machine			
Others			
Fire Prevention			
Fire Fighting Appliance			
Dangerous Goods Store			
Gas Welding Cylinders			
Others			
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**

**Submitted**

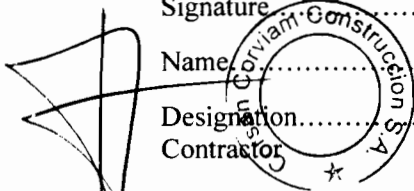
**Checked**

**Approved**

Signature.....  
 Name.....  
 Designation.....  
 Contractor

Signature.....  
 Name.....  
 Environmental Engineer.  
 Construction Supervision Consultant

Signature.....  
 Name.....  
 Resident Engineer



**ACCIDENT REPORT**[To be completed **ON OCCURRENCE** of injury by the Safety Officer]

Location : \_\_\_\_\_  
 Time : \_\_\_\_\_ Day/ Night Weather  
 : \_\_\_\_\_

**Part I****Type of Accident**

D01 ( )	Fall of person from a height	D11 ( )	Explosion
D02 ( )	Slip, trip or fall on same level	D12 ( )	Fire
D03 ( )	Struck against fixed objects	D13 ( )	Contact with hot or corrosive substance
D04 ( )	Struck by flying or falling objects	D14 ( )	Contact with poisonous gas or toxic substances.
D05 ( )	Struck by moving objects	D15 ( )	Contact with poisonous gas or toxic substances
D06 ( )	Struck / caught by cable	D16 ( )	Hand tool accident
D07 ( )	Stepping on hail etc.	D17 ( )	Vehicle / Mobile plant accident
D08 ( )	Handling without machinery	D18 ( )	Machinery operation accident
D09 ( )	Crushing / burying	D19 ( )	Other (please specify)
D10 ( )	Drowning or asphyxiation		

**Agent Involved in Accident**

E01 ( )	Machinery	E11 ( )	Excavation / underground working
E02 ( )	Portable power appliance	E12 ( )	
E03 ( )	Vehicle or associated equipment / machinery	E13 ( )	Ladder
E04 ( )	Material being handled, used or stored	E14 ( )	Scaffolding / gondola
E05 ( )	Gas, vapor, dust, fume or oxygen	E15 ( )	Construction formwork, shuttering and false work.
E06 ( )	Hand tools	E16 ( )	Electricity supply cable, wiring switchboard and associated equipment
E07 ( )	Floor edge	E17 ( )	Nail, sllnter or chipping
E08 ( )	Floor opening	E18 ( )	Other (Please specify)
E09 ( )	Left shaft	E19 ( )	
E10 ( )	Stair edge		

**Unsafe Action Relevant to the Accident**

F01 ( )	Operating without authority	F11 ( )	Failure to use eye protector
F02 ( )	Failure to secure objects	F12 ( )	Failure to use respirator
F03 ( )	Making safety devices inoperative	F13 ( )	Failure to use proper clothing
F04 ( )	Working on moving or dangerous equipment	F14 ( )	Failure to use warn others or given proper signals
F05 ( )	Using un-safety equipment	F15 ( )	Horseplay
F06 ( )	Adopting unsafe position or posture	F16 ( )	No unsafe action
F07 ( )	Operating or working at unsafe speed	F17 ( )	Others (please specify)
F08 ( )	Unsafe loading, Placing, mixing etc.	F18 ( )	
F09 ( )	Failure to use helmet	F19 ( )	
F10 ( )	Failure to use proper footwear		

G01 ( )	No protective gear	G08 ( )	Unsafe layout of job, traffic etc.
G02 ( )	Defective protective gear	G09 ( )	Unsafe process of job methods
G03 ( )	Improper dress / footwear	G10 ( )	Poor housekeeping
G04 ( )	Improper guarding	G11 ( )	Lack of warning system
G05 ( )	Improper ventilation	G12 ( )	Defective tool, machinery or materials

G06 ( )	Improper illumination	G13 ( )	No unsafe condition
G07 ( )	Improper procedure	G14 ( )	Others (please specify)

**Human Factors Relevant to the Accident**

H01 ( )	Incorrect attitude /motive	H06 ( )	Disobeyance of Rules
H02 ( )	Alcohol/ Drug Usage	H07 ( )	More Risk taking issue
H03 ( )	Poor perception issue	H08 ( )	Lack of Comprehension
H04 ( )	Unsafe act by other persons	H09 ( )	No unsafe personal factor
H05 ( )	Fatigue Related Issues	H10 ( )	Other (please specify)

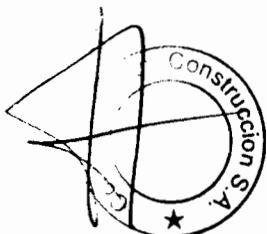
Remarks
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<b>Submitted</b>	<b>Checked</b>	<b>Approved</b>
Signature.....	Signature.....	Signature.....
Name.....	Name.....	Name.....
Designation..... Contractor	Environmental Engineer. Construction Supervision Consultant	Resident Engineer

**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

<b>Submitted</b>	<b>Checked</b>	<b>Approved</b>
Signature.....	Signature.....	Signature.....
Name.....	Name.....	Name.....
Designation..... Contractor	Environmental Engineer. Construction Supervision Consultant	Resident Engineer



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



**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 .....

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
<b>1. Air Monitoring</b>											
						SPM RSPM HC Sox NOx	SPM RSPM HC Sox NOx				
<b>2. Water Monitoring</b>											
						pH TSS TDS Turbidity Hardness Coliform BOD COD Oil & Grease	pH TSS TDS Turbidity Hardness Coliform BOD COD Oil & Grease				

Corsan Corviam Construction S.A.  
Contractor

Chief Engineer,  
World Bank Project, Odisha  
Employer

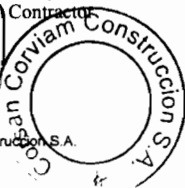
Chief Engineer,  
World Bank Project  
to the E.I.C.(Civil), Odisha  
Bhubaneswar.

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
<b>3. Soil Monitoring</b>											
						pH Organic Matter Alkalinity Conductivity Water holding Capacity Pb	pH Organic Matter Alkalinity Conductivity Water holding Capacity Pb				
<b>4.Noise Monitoring</b>											
						L day equivalent L night equivalent L equivalent	L day equivalent L night equivalent L equivalent				

**Remark**

**Submitted**

Signature.....  
Name.....  
Designation.....  
Contractor



Corsan Corviam Construction S.A.  
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  
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**

Signature.....

Name.....

Designation.....  
Contractor

**Checked**

Signature.....

Name.....

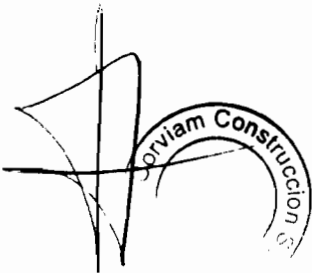
Environmental Engineer.  
Construction Supervision Consultant

**Approved**

Signature.....

Name.....

Resident Engineer



Corsan Corviam Construcción S.A, Spain  
**CONTRACTOR**

Corsan Corviam Construcción S.A.  
Contractor

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

**FORMAT FOR KEEPING RECORDS OF CONSENT OBTAINED BY CONTRACTOR**  
[Monthly Format]

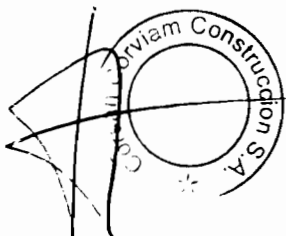
Report-Date: \_\_\_\_\_

Sl. No.	Clearance	Applicable Acts	Agencies	Obtained on	Valid upto	Remarks
1						
2						
3						
4						
5						
6						


**Remarks**

**Verified**  
Signature.....  
Name.....  
Resident Engineer  
Construction Supervision Consultant

**Countersigned**  
Signature.....  
Name.....  
Executive Engineer (PMU)



Corsan Corviam Construcción S.A.  
Contractor

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

**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	
	e) Utilized Quality	
	f) Balance Quantity	
11	Spoil and debris disposal:	
	a) Present status of land	
	b) Closure and completion plan	
12	Site specific traffic Safety management Plan:	
	a) Contractor installed the warning /regulatory Traffic signs at the construction site The arrangement adequate	
13	Safety equipment i.e. helmet, gloves, gumboot, mask,	

Corsan Corviam Construccion S.A, Spain  
**CONTRACTOR**

Corsan Corviam Construccion S.A.  
 Contractor

Volume-III :Page 91 of 94

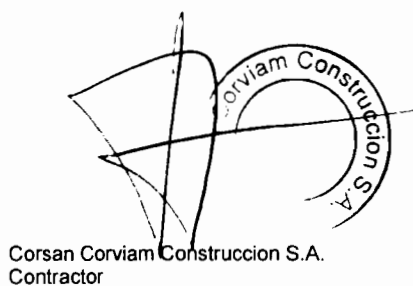
Chief Engineer,  
 World Bank Projects, Odisha  
**EMPLOYER**  
 Chief Engineer,  
 World Bank Projects, Odisha  
 Employer  
 World Bank Project  
 into the E.I.C.(Civil), Odisha  
 Bhubaneswar.

	earplugs 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.....  
 Name.....  
 Resident Engineer  
 Construction Supervision Consultant

**Countersigned**  
 Signature.....  
 Name.....  
 Executive Engineer (PMU)



**SUMMARY SHEET**  
 [To be filled MONTHLY by PMU]

**Form PMU 3**

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

Month \_\_\_\_\_ Date \_\_\_\_\_

Sl. No.	Description	Remarks
<b>1</b>	<b>No Objection Certificate</b>	
A	Hot mix Plant	
	Location 1	
	Location 2	
	Location 3	
B	Cement batching Plant	
	Location 1	
	Location 2	
	Location 3	
<b>2</b>	<b>Pollution Under Certificate</b>	
	Vehicles	
	Machineries	
<b>3</b>	<b>No objection Certificate for Diesel Gen set</b>	
	Location 1	
	Location 2	
<b>4</b>	<b>Labour Camps</b>	
	No. of sites Identified	
	Approved	
	Opened	
	Conforms to conditions imposed at the time of opening of sites	
	Closed	
<b>5</b>	<b>Workers</b>	
	No of workers employed	
	No of male workers	
	No of female workers	
	No of day workers	
<b>6</b>	<b>Burrow Area</b>	
	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	
<b>7.</b>	<b>Quarry</b>	
	No. of sites identified	
	Approved	
	Opened	
	Material available	
	Material obtained	
	No. of sites Rehabilitated	
<b>8</b>	<b>Disposal Locations</b>	
	No. of sites identified	
	Approved	
	Opened	
	Amount of Waste disposed	
	Type of waste disposed	
	No. of sites Rehabilitated	
<b>9</b>	<b>Road Safety</b>	
	Road Safety norms followed as per guidelines, SP-55 and approved Traffic plan	

Corsan Corviam Construccion S.A, Spain  
**CONTRACTOR**

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

Sl. No.	Description	Remarks
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	
12	Haul Roads	
	Adequacy of maintenance of Haul Road Network	

**Remarks**

**Verified**

Signature.....

Name.....

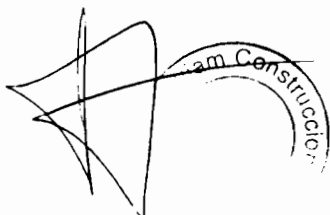
Resident Engineer  
Construction Supervision Consultant

**Countersigned**

Signature.....

Name.....

Executive Engineer (PMU)








GOVERNMENT OF ODISHA  
WORKS DEPARTMENT

CIVIL WORKS CONTRACT

**PACKAGE No. OSRP-Bal-P02**

*For*

Construction for Widening & Strengthening of Existing Carriageway  
to 2-Lane for Chandbali-Bhadrak-Anandpur Road  
(Km.0/000to Km.45/000 of SH-9 & Km.0/0 to Km.43/0 of SH-53)  
(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 CORSAN CORVIAM CONSTRUCCION S.A,**  
India Office: 2nd Floor, Blok Two, Vatika Business Park,  
Sector-49, Sohna Road, Gurgaon-122001, Haryana (India)  
Tel. No.:(+91) 124 4823 200, Fax: (+91) 124 4823 210

**[VOLUME-IV: DRAWINGS]**

**Agreement Value: Rs. 248,12,19,385**

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

September 27, 2013




## CONTENTS of CONTRACT

<b>Volume – I</b>	:	Letter of Acceptance, Letter Bid and addenda
<b>Volume – II</b>	:	Particular Conditions and the General Conditions;
<b>Volume – III</b>	:	Specifications
<b>Volume – IV</b>	:	Drawings
<b>Volume – V</b>	:	Completed Schedules,

## CONTENTS of VOLUME IV

Sl.	Description	Page No.
<b>1</b>	<b>BHADRAK TO CHANDBALI (0/0 TO 45/0KM. of SH-09)</b>	<b>1</b>
	A. Index, Plan & profile, Specifications, Utility Shifting & Environment Drawings	2-107
	B. Bridges & Culverts	108-168
<b>2</b>	<b>BHADRAK TO CHANDBALI (0/0 TO 45/0KM. of SH-09)</b>	<b>169</b>
	A. Plan & profile, Specifications, Utility Shifting & Environment Drawings	170-271
	B. Bridges & Culverts	272-298

  
Corsan Corjam Construccion S.A  
**Contractor**

  
**Chief Engineer**  
World Bank Projects, Odisha  
**Employer**  
Chief Engineer  
World Bank Project  
On the E.I.C.(Civil), Odisha  
Bhubaneswar.

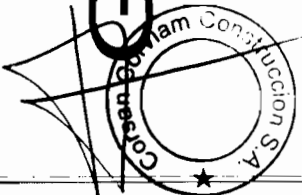


**GOVERNMENT OF ODISHA**  
**WORKS DEPARTMENT**

**ODISHA STATE ROAD PROJECT**  
**( UNDER WORLD BANK ASSISTANCE )**

**BHADRAK-CHANDBALI (SH-09)**  
**KM.0/0 TO KM.45/0**

**VOLUME - IV**  
**DRAWINGS**



# INDEX OF HIGHWAY DRAWINGS (SH-09: Bhadrak-Chandbali)

Sl. No.	DESCRIPTION	DRAWING NO.
1	INDEX SHEETS	
2	Index of Highway Drawings	OSRP/CEG/SH-09/INDEX/01
3	Index of Other Highway & Environment Drawing	OSRP/CEG/SH-09/INDEX/02
4	Index of Drawings of Structures	OSRP/CEG/SH-09/INDEX/03
5	List of Structure (Culverts) (1 of 2)	OSRP/CEG/SH-09/LOS/01
6	List of Structure (Culverts) (2 of 2)	OSRP/CEG/SH-09/LOS/02
7	Attempted Sketches of Highway.	OSRP/PMU/SH-09/AS/01
<b>HORIZONTAL CURVE DETAILS</b>		
8	Horizontal Curve Details (1 of 2)	OSRP/CEG/SH-09/HC/01
9	Horizontal Curve Details (2 of 2)	OSRP/CEG/SH-09/HC/02
<b>VERTICAL CURVE DETAILS</b>		
10	Vertical Curve Details (1 of 2)	OSRP/CEG/SH-09/VC/01
11	Vertical Curve Details (2 of 2)	OSRP/CEG/SH-09/VC/02
<b>PLAN &amp; PROFILE</b>		
12	Plan & Profile km 1.000 to km 2.000	OSRP/CEG/SH-09/P & P/01
13	Plan & Profile km 2.000 to km 3.000	OSRP/CEG/SH-09/P & P/02
14	Plan & Profile km 3.000 to km 4.000	OSRP/CEG/SH-09/P & P/03
15	Plan & Profile km 4.000 to km 5.000	OSRP/CEG/SH-09/P & P/04
16	Plan & Profile km 5.000 to km 6.000	OSRP/CEG/SH-09/P & P/05
17	Plan & Profile km 6.000 to km 7.000	OSRP/CEG/SH-09/P & P/06
18	Plan & Profile km 7.000 to km 8.000	OSRP/CEG/SH-09/P & P/07
19	Plan & Profile km 8.000 to km 9.000	OSRP/CEG/SH-09/P & P/08
20	Plan & Profile km 9.000 to km 10.000	OSRP/CEG/SH-09/P & P/09
21	Plan & Profile km 10.000 to km 11.000	OSRP/CEG/SH-09/P & P/10
22	Plan & Profile km 11.000 to km 12.000	OSRP/CEG/SH-09/P & P/11
23	Plan & Profile km 12.000 to km 13.000	OSRP/CEG/SH-09/P & P/12
24	Plan & Profile km 13.000 to km 14.000	OSRP/CEG/SH-09/P & P/13
25	Plan & Profile km 14.000 to km 15.000	OSRP/CEG/SH-09/P & P/14
26	Plan & Profile km 15.000 to km 16.000	OSRP/CEG/SH-09/P & P/15
27	Plan & Profile km 16.000 to km 17.000	OSRP/CEG/SH-09/P & P/16
28	Plan & Profile km 17.000 to km 18.000	OSRP/CEG/SH-09/P & P/17
29	Plan & Profile km 18.000 to km 19.000	OSRP/CEG/SH-09/P & P/18
30	Plan & Profile km 19.000 to km 20.000	OSRP/CEG/SH-09/P & P/19
31	Plan & Profile km 20.000 to km 21.000	OSRP/CEG/SH-09/P & P/20
32	Plan & Profile km 21.000 to km 22.000	OSRP/CEG/SH-09/P & P/21
33	Plan & Profile km 22.000 to km 23.000	OSRP/CEG/SH-09/P & P/22
34	Plan & Profile km 23.000 to km 24.000	OSRP/CEG/SH-09/P & P/23
35	Plan & Profile km 24.000 to km 25.000	OSRP/CEG/SH-09/P & P/24

Sl. No.	DESCRIPTION	DRAWING NO.
36	Plan & Profile km 25.000 to km 26.000	OSRP/CEG/SH-09/P & P/25
37	Plan & Profile km 26.000 to km 27.000	OSRP/CEG/SH-09/P & P/26
38	Plan & Profile km 27.000 to km 28.000	OSRP/CEG/SH-09/P & P/27
39	Plan & Profile km 28.000 to km 29.000	OSRP/CEG/SH-09/P & P/28
40	Plan & Profile km 29.000 to km 30.000	OSRP/CEG/SH-09/P & P/29
41	Plan & Profile km 30.000 to km 31.000	OSRP/CEG/SH-09/P & P/30
42	Plan & Profile km 31.000 to km 32.000	OSRP/CEG/SH-09/P & P/31
43	Plan & Profile km 32.000 to km 33.000	OSRP/CEG/SH-09/P & P/32
44	Plan & Profile km 33.000 to km 34.000	OSRP/CEG/SH-09/P & P/33
45	Plan & Profile km 34.000 to km 35.000	OSRP/CEG/SH-09/P & P/34
46	Plan & Profile km 35.000 to km 36.000	OSRP/CEG/SH-09/P & P/35
47	Plan & Profile km 36.000 to km 37.000	OSRP/CEG/SH-09/P & P/36
48	Plan & Profile km 37.000 to km 38.000	OSRP/CEG/SH-09/P & P/37
49	Plan & Profile km 38.000 to km 39.000	OSRP/CEG/SH-09/P & P/38
50	Plan & Profile km 39.000 to km 40.000	OSRP/CEG/SH-09/P & P/39
51	Plan & Profile km 40.000 to km 41.000	OSRP/CEG/SH-09/P & P/40
52	Plan & Profile km 41.000 to km 42.000	OSRP/CEG/SH-09/P & P/41
53	Plan & Profile km 42.000 to km 43.000	OSRP/CEG/SH-09/P & P/42
54	Plan & Profile km 43.000 to km 44.000	OSRP/CEG/SH-09/P & P/43
55	Plan & Profile km 44.000 to km 45.000	OSRP/CEG/SH-09/P & P/44
<b>MAJOR JUNCTION</b>		
56	Plan for Major Junction at Km.0/000	OSRP/CEG/SH-09/MJ/01
57	Plan for Major Junction at Km.6/500	OSRP/CEG/SH-09/MJ/02

PROJECT:-	DRG NO.	OSRP/CEG/SH-09/INDEX/01	REV. RD	REV. R1	APPROVED
	SH.NO.	DATE : 17/1/2013	PREPARED BY:	EE/PMU	CE, World Bank Projects.
ORISSA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE	SCALE	REV :	R1		

# INDEX OF OTHER HIGHWAY & ENVIRONMENT DRAWINGS (SH-09: Bhadrak-Chandbali)

NO	DESCRIPTION	DRAWING NO.
<b>STANDARD DRAWINGS</b>		
59	Schedule of Road Sign Post (1 of 2)	OSRP/CEG/SH-09/SCH/01
60	Schedule of Road Sign Post (2 of 2)	OSRP/CEG/SH-09/SCH/02
61	Schedule of Extra Widening & Guard Posts	OSRP/CEG/SH-09/SCH/03
62	Schedule for Pavement Composition	OSRP/CEG/SH-09/SCH/PAV
63	Schedule for Pavement & Cross Section Type	OSRP/CEG/SH-09/SCH/TCS
<b>Typical X-sections</b>		
64	Typical Cross Sections	OSRP/CE/TCS/ 2 & 3
65	Typical Cross Sections	OSRP/CE/TCS/ 3& 39
66	Typical Cross Sections	OSRP/CE/TCS/ 1&35
67	Typical Cross Sections	OSRP/CE/TCS/ 32&33
68	Typical Slope Protection work&TCS-40	OSRP/CEG/PW
69	Standard Drawings Details of Drains & Kerb	OSRP/CEG/DR
70	Details of Application of Super Elevation	OSRP/CEG/SE
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71	Typical 4-Legged Intersection with single Lane BT Road	OSRP/CEG/JN/01
72	Typical T-Junction with Single Lane BT Road	OSRP/CEG/JN/02
73	Typical Y-Junction With Single Lane BT/Earthen Road	OSRP/CEG/JN/03
74	Standard Drawings Typical - Cross Drain Single Lane BT Road/Earth Road	OSRP/CEG/CD-JN
<b>ROAD SIGNS, MARKINGS &amp; Misc. ROADWAY FURNITURES</b>		
75	Standard Drawings Details of Road Humps & Rumble Strips	OSRP/CEG/RH & RS
76	Schedule of Humps & Rumples	OSRP/CEG/SCH-RH&RS
77	Standard Drawings Details of Footpath Barriers	OSRP/CEG/FB
78	Standard Drawings Metal Beam Crash Barrier Details	OSRP/CEG/CB
79	Standard Drawings Typical K.M Stone & 5th KM Stone	OSRP/CEG/KM/01

NO	DESCRIPTION	DRAWING NO.
80	Standards Drawings Typical Details of 200m Stone & Guard post	OSRP/CEG/KM & GP
81	Standards Drawings Details of Road Delimiters	OSRP/CEG/RD
82	Standards Drawings Details of RPMs & Chevron Markers	OSRP/CEG/RPM
83	Schedule of RPPMs	OSRP/CEG/RPM/01
84	Standards Drawings Typical Road Marking Details (Sheet 1 of 2)	OSRP/CEG/RM/01
85	Standards Drawings Typical Road Marking Details (Sheet 2 of 2)	OSRP/CEG/RM/02
86	Standards Drawings Typical Road Signs (Sheet 1 of 4)	OSRP/CEG/RS/01
87	Standards Drawings Typical Road Signs (Sheet 2 of 4)	OSRP/CEG/RS/02
88	Standards Drawings Typical Road Signs (Sheet 3 of 4)	OSRP/CEG/RS/03
89	Standards Drawings Typical Road Signs (Sheet 4 of 4)	OSRP/CEG/RS/04
90	Standards Drawings Typical Bus Bay Sheet - I	OSRP/CEG/BB/01
91	Standards Drawings Typical Bus Bay Sheet - II	OSRP/CEG/BB/02
92	Typical Details of Dowel Bar & tie Bar Arrangement	OSRP/CEG/RIGID-1
93	Typical Details of Transition between Rigid and Flexible Pavement	OSRP/CEG/RIGID-2
94	Typical Details of Transition of Road sections	OSRP/CEG/TR

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95	Standard Drawings of Toll Plaza Layout	OSRP/CEG/TP/01
96	Standard Drawings Toll Plaza Main Office	OSRP/CEG/TP/02
97	Standard Drawings Toll Booth	OSRP/CEG/TP/03
98	Standard Drawings Barrier Gate for Toll Plaza	OSRP/CEG/TP/04
99	Standard Drawings Electrical Layout and Main Office	OSRP/CEG/TP/05
100	Standard Drawings Electrical Layout Toll Plaza	OSRP/CEG/TP/06
101	Standard Drawings Eplumbin Layout - Toll Plaza	OSRP/CEG/TP/07

### ENVIRONMENT DRAWINGS

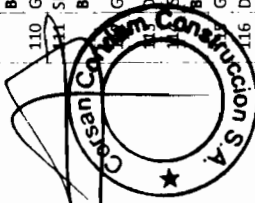
102	Toe Wall for Water Bodies	OSRP/CEG/ENV-03
103	Interception Barricade for Institutions	OSRP/CEG/ENV-05
104	Typical arrangement for Reptile Under Pass	OSRP/CEG/ENV-14
105	Typical Arrangement for Utility Duct	OSRP/CEG/MISC - 01
106	Typical Drawing for Silt Fence Sediment Arrestor	OSRP/PMU/ENV - 01
107	Oil & Grease Trap for Plant Site	OSRP/CEG/ENV/06

PROJECT:-		INDEX OF OTHER HIGHWAY & ENVIRONMENT DRAWINGS (SH-09: Bhadrak-Chandbali)	
DRG NO.	OSRP/CEG/SH-09/INDEX/02	REV R1	Approved
SH.NO.	DATE : 18/01/13	REV R1	Chief Engineer, World Bank Projects
SCALE		EE,PMU	

# INDEX OF STRUCTURAL DRAWINGS

SL. NO	DRAWING TITLE	DRAWING NO.	SL. NO	DRAWING TITLE	DRAWING NO.
108	BRIDGE AT KM 1+005 GENERAL ARRANGEMENT DRAWING	OSRP/CEG/SH-9/BR/1+005/01	138	BRIDGE AT KM 33+900 GENERAL ARRANGEMENT DRAWING	OSRP/CEG/SH-9/BR/33+900/01
109	SITE PLAN	OSRP/CEG/SH-9/BR/1+005/02	139	SITE PLAN	OSRP/CEG/SH-9/BR/33+900/02
110	BRIDGE AT KM 1+800 GENERAL ARRANGEMENT DRAWING	OSRP/CEG/SH-9/BR/1+800/01	140	BRIDGE AT KM 36+005 GENERAL ARRANGEMENT DRAWING	OSRP/CEG/SH-9/BR/36+005/01
111	SITE PLAN	OSRP/CEG/SH-9/BR/1+800/02	141	SITE PLAN	OSRP/CEG/SH-9/BR/36+005/02
112	BRIDGE AT KM 3+200 GENERAL ARRANGEMENT DRAWING	OSRP/CEG/SH-9/BR/3+200/01	142	BRIDGE AT KM 42+400 GENERAL ARRANGEMENT DRAWING	OSRP/CEG/SH-9/BR/42+400/01
113	DIMENSION AND REINFORCEMENT DETAILS	OSRP/CEG/SH-9/BR/3+200/02	143	SITE PLAN	OSRP/CEG/SH-9/BR/42+400/02
114	SITE PLAN	OSRP/CEG/SH-9/BR/3+200/03	144	BRIDGE AT KM 43+500 GENERAL ARRANGEMENT DRAWING	OSRP/CEG/SH-9/BR/43+500/01
115	BRIDGE AT KM 3+900 GENERAL ARRANGEMENT DRAWING	OSRP/CEG/SH-9/BR/3+900/01	145	SITE PLAN	OSRP/CEG/SH-9/BR/43+500/02
116	DIMENSION AND REINFORCEMENT DETAILS	OSRP/CEG/SH-9/BR/3+900/02	146	REHABILITATION BRIDGES BRIDGE AT KM 9+300 REHABILITATION DETAILS	OSRP/CEG/SH-9/BR/9+300/01
117	SITE PLAN	OSRP/CEG/SH-9/BR/3+900/03	147	BRIDGE AT KM 30+200 REHABILITATION DETAILS	OSRP/CEG/SH-9/BR/30+200/01
118	BRIDGE AT KM 6+050 GENERAL ARRANGEMENT DRAWING	OSRP/CEG/SH-9/BR/6+050/1	148	GENERAL ARRANGEMENT DRAWING	OSRP/CEG/SH-9/BR/30+200/02
119	DIMENSION AND REINFORCEMENT DETAILS	OSRP/CEG/SH-9/BR/6+050/2	149	BRIDGE AT KM 34+700 REHABILITATION DETAILS	OSRP/CEG/SH-9/BR/34+700/01
120	SITE PLAN	OSRP/CEG/SH-9/BR/6+050/3	150	REHABILITATION DETAILS	OSRP/CEG/SH-9/BR/38+100/01
121	BRIDGE AT KM 9 +200 GENERAL ARRANGEMENT DRAWING	OSRP/CEG/SH-9/BR/9+200/01	151	MULTICELL BOX BRIDGES GAD 3/33/0 TRIPLE CELL BOX	OSRP/CEG/SH-9/TRIPLE BOX /01
122	SITE PLAN	OSRP/CEG/SH-9/BR/9+200/02	152	GAD 3x8M TRIPLE CELL BOX	OSRP/CEG/SH-9/TRIPLE CELL/01
123	BRIDGE AT KM 13+600 GENERAL ARRANGEMENT DRAWING	OSRP/CEG/SH-9/BR/13+600/01	153	REINFORCEMENT DETAILS 3x8m TRIPLE CELL BOX	OSRP/CEG/SH-9/TRIPLE CELL/02
124	SITE PLAN	OSRP/CEG/SH-9/BR/13+600/02	154	GENERAL ARRANGEMENT DRAWING_10 ROW PIPE CULVERT DRAWINGS	OSRP/CEG/SH-9/PIPE BRIDGE/01
125	BRIDGE AT KM 28+100 GENERAL ARRANGEMENT DRAWING	OSRP/CEG/SH-9/BR/28+100/01	155	For R.C.C. Single pipe culverts (1x1.0m Dia)	OSRP/CEG/SH-9/Pipe/1R
126	DIMENSION AND REINFORCEMENT DETAILS	OSRP/CEG/SH-9/BR/28+100/02	156	For R.C.C. Double pipe culverts (2x1.0m Dia)	OSRP/CEG/SH-9/Pipe/2R
127	SITE PLAN	OSRP/CEG/SH-9/BR/28+100/03	157	Typical RCC Pipe Culvert 3x1m	OSRP/CEG/SH-16/PIPE EXT-01
128	BRIDGE AT KM 28 +800 GENERAL ARRANGEMENT DRAWING	OSRP/CEG/SH-9/BR/28+800/01	158	Typical RCC Pipe Culvert 5x1m	OSRP/CEG/SH-16/PIPE -05R
129	DIMENSION AND REINFORCEMENT DETAILS	OSRP/CEG/SH-9/BR/28+800/02	159	GENERAL ARRANGEMENT DRAWING SINGLE CELL R.C.C. BOX CULVERT	OSRP/CEG/SH-9/BOX CUL-01
130	SITE PLAN	OSRP/CEG/SH-9/BR/28+800/03	160	REINFORCEMENT DETAIL OF SINGLE CELL BOX SINGLE CELL R.C.C. BOX CULVERT	OSRP/CEG/SH-9/BOX CUL-02
131	BRIDGE AT KM 30+050 GENERAL ARRANGEMENT DRAWING	OSRP/CEG/SH-9/BR/30+050/01	161	GENERAL ARRANGEMENT DRAWING TYPICAL WIDENING FOR EXISTING SLAB CULVERTS	OSRP/CEG/SH-9/SLAB CUL/W-01
132	SITE PLAN	OSRP/CEG/SH-9/BR/30+050/02	162	DIMENSION AND REINFORCEMENT DETAILS OF SLAB & ABUTMENTS TYPICAL WIDENING FOR EXISTING SLAB CULVERTS	OSRP/CEG/SH-9/SLAB CUL/W-02
133	BRIDGE AT KM 32+100 GENERAL ARRANGEMENT DRAWING	OSRP/CEG/SH-9/BR/32+100/01	163	MISC DRAWING DIMENSION & REINFORCEMENT DETAILS OF RETAINING WALL	OSRP/CEG/SH-9/RW/MISC-01
134	DIMENSION AND REINFORCEMENT DETAILS	OSRP/CEG/SH-9/BR/32+100/02	164	WALL	OSRP/CEG/SH-9/RW/MISC-02
135	SITE PLAN	OSRP/CEG/SH-9/BR/32+100/03	165	DIMENSION & REINFORCEMENT DETAILS OF RETURN WALL	OSRP/CEG/SH-9/BR//FPW/01
136	BRIDGE AT KM 33+ 500 GENERAL ARRANGEMENT DRAWING	OSRP/CEG/SH-9/BR/33+500/01	166	TYPICAL DETAILS OF FLOOR PROTECTION WORKS	OSRP/CEG/SH-9/BR/SCW/
137	SITE PLAN	OSRP/CEG/SH-9/BR/33+500/02	167	TYPICAL SECTIONS OF CURTAIN WALL JACKETTING DETAIL OF ABUTMENT & PIER DETAILS OF CRASH BARRIER, EXPANSION JOINT, APPROACH SLAB & DRAINAGE SPOUT	OSRP/CEG/BR/JT-01
			168	APPROACH SLAB & DRAINAGE SPOUT	OSRP/CEG/BR/MISC-02

PROJECT:-		Index of Drawings of Structures	
DRG. NO.	OSRP/CEG/SH-09/INDEX/03	REV.1	APPROVED
SH.NO.	DATE : 18/1/2013	EE/PMU	CE, World Bank Projects.
SCALE			
		PREPARED BY:	
		CEG	



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



**List of Culverts for Balance Work (with Status)**

S. No.	Chainage	Type	Span	Indicative Present Status	S. No.	Chainage	Span	Type	Indicative Present Status	S. No.	Chainage	Span	Type	Indicative Present Status
1	0/000	1:23/0 BOX	BOX	Not stratred	19	12/397	1/22/0	RCC BOX	Not stratred	36	19/096	5x1.0mφ	HP 5 ROW	Not stratred
2	2/407	1X1.0M PIPE	PIPE	Pipe portion done, rest to be done	20	12/923	1/22/0	RCC BOX	Completed upto slab casting, rest to be done.	37	19/367	1/33/0	RCC BOX	Not stratred
3	2/865	3X3M SLAB	SLAB	Completed upto slab casting, rest to be done.	21	13/132	1/23/0	RCC BOX	Completed upto slab casting, rest to be done.	38	19/888	2x5.0m	SLAB CULVERT	Not stratred
4	4/350	0M PIPE	PIPE	Pipe portion done, rest to be done	22	14/455	10x1.0mφ	PIPE	Pipe portion done, rest to be done	39	20/144	1/22/0	RCC BOX	Not stratred
5	6/096	0M PIPE	PIPE	Pipe portion done, rest to be done	23	14/791	1/22/0	RCC BOX	Completed upto slab casting, rest to be done	40	20/365	5x1.0mφ	HP 5 ROW	Not stratred
6	6/096	-	-	Rehabilitation to be done	24	15/125	1/43/0	RCC BOX	Completed upto slab casting, rest to be done.	41	20/691	5x1.0mφ	HP 5 ROW	Not stratred
7	6/448	3x1.0M PIPE	PIPE	Pipe portion done, rest to be done	25	15/360	1/22/0	RCC BOX	Return Walls, Railing, Floor protection, stone pitching etc. to be done.	42	21/074	5x1.0mφ	HP 5 ROW	Not stratred
8	7/001	2x1.0mφ PIPE	PIPE	Pipe portion done, rest to be done	26	15/425	1/43/0	RCC BOX	Return Walls, Railing, Floor protection, stone pitching etc. to be done.	43	21/235	5x1.0mφ	HP 5 ROW	Not stratred
9	7/927	1X1.0mφ PIPE	PIPE	Pipe portion done, rest to be done	27	15/714	1/43/0	RCC BOX	Return Walls, Railing, Floor protection, stone pitching etc. to be done.	44	21/490	5x1.0mφ	HP 5 ROW	Not stratred
10	8/710	15X1.0mφ PIPE	PIPE	Pipe portion done, rest to be done	28	15/750	1/43/0	RCC BOX	Return Walls, Railing, Floor protection, stone pitching etc. to be done.	45	21/829	1/22/0	RCC BOX	Not stratred
11	8/939	1.640 RCC BOX	RCC BOX	Return Walls, Railing, Floor protection, stone pitching etc. to be done	29	15/850	1/43/0	RCC BOX	Completed upto slab casting, rest to be done	46	22/570	5x1.0mφ	HP 5 ROW	Not stratred
12	9/027	2x1.0mφ PIPE	PIPE	Not Started	30	16/520	10x1.0mφ	HP 10 ROW	Excavation Completed and filled back for restoration of traffic	47	23/240	1/43/0	RCC BOX	Not stratred
13	9/245	-	RCC BOX	Rehabilitation not done	31	16/733	5x1.0mφ	HP 5 ROW	Not stratred	48	24/096	1/22/0	RCC BOX	Not stratred
14	9/602	1:23/0	RCC BOX	Return Walls, Railing, Floor protection, stone pitching etc. to be done.	32	17/078	5x1.0mφ	HP 5 ROW	Not stratred	49	24/478	5x1.0mφ	HP 5 ROW	Not stratred
15	9/902	1:63/0	RCC BOX	Return Walls, Railing, Floor protection, stone pitching etc. to be done.	33	17/666	5x1.0mφ	HP 5 ROW	Not stratred	50	24/770	1/22/0	RCC BOX	Not stratred
16	10/260	1:22/0	RCC BOX	Railing, Floor protection, stone pitching etc. to be done.	34	17/928	5x1.0mφ	HP 5 ROW	Not stratred	51	25/249	5x1.0mφ	HP 5 ROW	Not stratred
17	11/142	1:23/0	BOX	Box Cell portion completed	35	18/195	5x1.0mφ	HP 5 ROW	Not stratred	52	25/425	3/33/0	BOX TYPE BRIDGE	Not stratred
18	11/535	1:22/0	RCC BOX	Box Cell Raft & lift wall completed remaining to be done	36	18/625	5x1.0mφ	HP 5 ROW	Not stratred	53	25/550	10x1.0mφ	PIPE	Pipe portion done, rest to be done
										54	26/430	1/22/0	RCC BOX	Not stratred

**List of Culverts for Balance Work (with Status)**

DRG NO. OSRP/CEG/SH-09/LOS/01	REV R1	APPROVED
SH.NO. DATE : 18/01/2013	EE/PMU	CE, World Bank Projects.
SCALE	PREPARED BY: CEG Ltd.	
PROJECT: ODISHA STATE ROAD PROJECT		

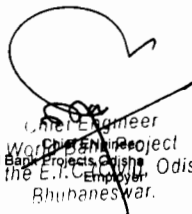
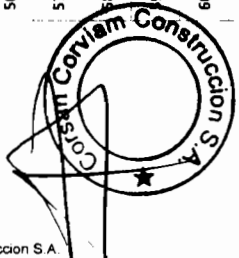
Chief Engineer  
World Bank Projects Odisha  
Employer  
O/o the E.C.C. (Civil), Odisha  
Bhubaneswar

List of Culverts for Balance Work (with Status)									
S. No.	Chainage	Type	Span	Indicative Present Status	S. No.	Chainage	Type	Span	Indicative Present Status
55	27/800	10x1.0m $\phi$ PIPE		Not stratred	75	35/090	BOX TYPE BRIDGE	3/33/0	Slab casted, rest to be done
56	27/925	3/33/0 BOX TYPE BRIDGE		Not stratred	76	35/280	BOX TYPE BRIDGE	3/33/0	Not stratred
57	28/225	1/43/0 RCC BOX		Not stratred	77	35/340	BOX TYPE BRIDGE	3x8M	Not stratred
58	28/500	3/83/0 BOX TYPE BRIDGE		Not stratred	78	35/425	BOX TYPE BRIDGE	3x8M	Not stratred
59	28/900	3/33/0 BOX TYPE BRIDGE		Not stratred	79	35/510	BOX TYPE BRIDGE	3x8M	Not stratred
60	29/850	3/33/0 BOX TYPE BRIDGE		Not stratred	80	35/600	BOX TYPE BRIDGE	3x8M	Not stratred
61	29/850	10x1.0m $\phi$ PIPE		Pipe portion done.	81	35/680	BOX TYPE BRIDGE	3x8M	Not stratred
62	30/335	3/33/0 REHABILITATION		Not stratred	82	35/900	BOX TYPE BRIDGE	3x8M	Not stratred
63	30/430	1/44/0 RCC BOX		Not stratred	83	35/975	BOX TYPE BRIDGE	3x8M	Not stratred
64	30/821	1/22/0 RCC BOX		Not stratred	84	36/040	BOX TYPE BRIDGE	3x8M	Not stratred
65	31/050	3/33/0 BOX TYPE BRIDGE		Not stratred	85	36/850	RCC BOX	1/44/0	Not stratred
66	31/150	3/33/0 BOX TYPE BRIDGE		Not stratred	86	36/775	RCC BOX	1/43/0	Not stratred
67	31/400	1/43/0 RCC BOX		Not stratred	87	37/000	BOX TYPE BRIDGE	3/33/0	Not stratred
68	31/700	1/43/0 RCC BOX		Not stratred	88	37/075	RCC BOX	3/33/0	Not stratred
69	31/900	10x1.0m $\phi$ PIPE		Pipe portion done, rest to be done	89	37/850	BOX TYPE BRIDGE	1/43/0	Not stratred
70	32/380	3/33/0 BOX TYPE BRIDGE		Not stratred	90	38/005	REHABILITATION		Not stratred
71	34/025	3/33/0 BOX TYPE BRIDGE		Not stratred	91	39/387	HP 5 ROW	5x1.0m $\phi$	Not stratred
72	34/375	3/33/0 BOX TYPE BRIDGE		Not stratred	92	39/837	HP 5 ROW	5x1.0m $\phi$	Not stratred
73	34/803	Rehabilitation		Not stratred	93	40/310	HP 5 ROW	5x1.0m $\phi$	Not stratred
74	35/000	3/33/0		Slab casted, rest to be done	94	40/974	HP 5 ROW	5x1.0m $\phi$	Not stratred

**List of Attempted Minor/Major Bridges for Balance Work (with status)**

1	1/015	3/33/0	RCC BOX	Box Cell PCC completed
2	3/241	2x8M	RCC BOX	Slab casted. Balance to be done
3	3/862	3x8M	BOX	Completed upto slab casting.
4	9/159	3/33/0	RCC BOX	Slab casted. Balance to be done
5	13/646	3/33/0	RCC BOX	Completed upto slab casting, rest to be done
6	32/100	3/63/0	BOX TYPE BRIDGE	Excavation Completed and filled back for restoration of traffic.

List of Culverts for Balance Work (with Status)									
PROJECT:	ODISHA STATE ROAD PROJECT	DRG NO.	OSR/CEG/SH-09/LOS/02	REV.1	EE/PMU	APPROVED	CL. World Bank Projects.		
SH NO.		DATE	18/01/2013	PREPARED BY:	CEG/UD				
SCALE		REV.	R1						



**KM wise Details of Attempted\* Works for SH-9**

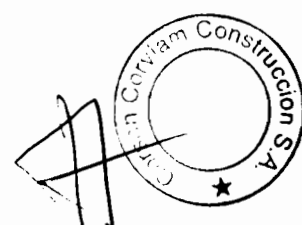
FROM	TO	Chainage(KM)		Earth Work(Mtr.)		Sub Grade(Mtr.)		GSB(Mtr.)		WMM		DBM		BC		DLC		POC	
		LHS	RHS	LHS	RHS	LHS	RHS	LHS	RHS	LHS	RHS	LHS	RHS	LHS	RHS	LHS	RHS	LHS	RHS
0+000	1+000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1+000	2+000	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800
2+000	3+000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
3+000	4+000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
4+000	5+000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
5+000	6+000	755	755	755	755	755	755	755	755	755	755	755	755	755	755	755	755	755	755
6+000	7+000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
7+000	8+000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
8+000	9+000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
9+000	10+000	835	835	470	470	470	470	470	470	385	385	385	385	385	385	385	385	385	385
10+000	11+000	740	910	740	910	740	910	740	910	740	740	740	740	740	740	740	740	740	740
11+000	12+000	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
12+000	13+000	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
13+000	14+000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
14+000	15+000	870	870	870	870	870	870	870	870	870	870	870	870	870	870	870	870	870	870
15+000	16+000	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635
16+000	17+000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17+000	18+000	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140
18+000	19+000	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
19+000	20+000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20+000	21+000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21+000	22+000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22+000	23+000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23+000	24+000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24+000	25+000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25+000	26+000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26+000	27+000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27+000	28+000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28+000	29+000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29+000	30+000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30+000	31+000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31+000	32+000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32+000	33+000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33+000	34+000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34+000	35+000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35+000	36+000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
36+000	37+000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
37+000	38+000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38+000	39+000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39+000	40+000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
40+000	41+000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
41+000	42+000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42+000	43+000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
43+000	44+000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
44+000	45+000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total</b>		<b>12170</b>	<b>12340</b>	<b>11465</b>	<b>11635</b>	<b>10875</b>	<b>11195</b>	<b>9485</b>	<b>9485</b>	<b>9215</b>	<b>9215</b>	<b>9215</b>	<b>9215</b>	<b>4465</b>	<b>4465</b>	<b>85</b>	<b>225</b>	<b>85</b>	<b>225</b>
<b>Balance work to be done in Metre</b>		<b>32830</b>	<b>32660</b>	<b>33535</b>	<b>33365</b>	<b>34125</b>	<b>33805</b>	<b>29185</b>	<b>29185</b>	<b>35785</b>	<b>35785</b>	<b>35785</b>	<b>35785</b>	<b>40535</b>	<b>40535</b>	<b>6245</b>	<b>6105</b>	<b>6245</b>	<b>6105</b>

\* Attempted means work has been started and is either in partial or fully completed state.

PROJECT:-		KM wise Details of Attempted Works for SH-9			
DRG NO.	OSRP/PMU/SH-09/AS/01	REV. R1	REV. R1	REV. R1	APPROVED
SH. NO.	DATE : 18/01/2013	PREPARED BY:	CEG Ltd.	EE/PMU	CE, World Bank Projects.
SCALE					

**HORIZONTAL CURVE DETAILS**  
ORISSA STATE ROAD PROJECT (SH-9) BHADRAK TO CHANDBALI KM 0000 TO 45000

Curve No.	Curve Direction	Chainage	HIP Details		Total Deflection Angle	Total Deviation Angle	Design Speed (Kmph)	Curve Radius (m)	Transition Length (m)	Deviation Angle of Transition Curve (Δs)	Circular Length (m)	Tangent Distance (m)	Shift (m)	Straight Distance from TP to PC	Superelevation (%)	Transition Start Chainage	Circular Start Chainage	Circular End Chainage
			Easting	Northing	Δ	Δ	V	Rc	Ls	Δs	Lc	Ts	S	k	e	TS	SC	CS
1	Left	114.935	446769.929	2328711.95	0.140	0.140	100	50000	0	0.000	122.488	61.244	0.000	0.000	2.500		53.693	176.177
2	Right	912.456	447476.999	2328342.95	0.160	0.160	100	60000	0	0.000	167.981	83.790	0.000	0.000	2.500		828.661	996.252
3	Right	1848.271	448302.657	2327902.85	17.827	17.827	80	500	90	5.157	65.567	123.511	0.675	44.988	5.688	1725.441	1815.441	1881.008
4	Right	3040.908	449133.991	2327048.66	36.889	36.889	80	300	75	7.162	118.152	137.798	0.781	37.480	7.000	2906.056	3099.208	3174.000
5	Left	3525.277	449224.2	2326571.63	60.199	60.199	80	400	60	4.297	360.206	262.037	0.375	29.984	7.000	3271.928	3331.928	3692.134
6	Left	4590.704	450228.312	2326143.8	13.633	13.633	100	1800	0	0.000	428.280	215.156	0.000	0.000	2.500		4375.548	4803.829
7	Right	5230.214	450862.228	2326045.39	11.481	11.481	80	500	55	1.970	105.302	107.935	0.158	27.489	3.556	5122.487	5177.548	5292.789
8	Left	5725.991	451331.169	2325885.44	37.676	37.676	65	200	60	8.594	71.516	88.468	0.749	29.978	7.000	5629.847	5689.847	5761.362
9	Left	6013.944	451608.178	2325965.26	9.409	9.409	65	700	20	0.819	94.950	67.807	0.024	10.000	2.683	5946.396	5966.396	6061.346
10	Right	6501.274	452047.604	2326174.79	50.758	50.758	65	200	60	8.594	117.177	125.209	0.749	29.978	7.000	6440.949	6450.949	6556.127
11	Right	7062.868	452568.873	2325958.45	0.940	0.940	100	10000	0	0.000	164.003	82.003	0.000	0.000	2.500	6380.949	6390.949	6440.949
12	Left	7466.861	452935.911	2325789.64	0.415	0.415	100	25000	0	0.000	181.284	90.642	0.000	0.000	2.500	6980.964	6990.964	7144.868
13	Right	8159.784	453566.808	2325503.15	10.004	10.004	80	600	45	2.148	59.758	75.024	0.141	22.499	7.000	7376.218	7386.218	7557.504
14	Left	8358.83	453733.218	2325393.9	10.570	10.570	80	600	45	2.149	65.684	78.011	0.141	22.499	7.000	8084.880	8094.880	8189.638
15	Right	8951.746	454269.879	2325143.45	36.828	36.828	80	240	90	10.743	64.265	125.318	1.404	44.947	7.000	8280.955	8325.955	8391.639
16	Right	9353.617	454475.181	2324798.5	13.326	13.326	80	500	50	2.865	66.287	83.429	0.208	24.998	5.688	8829.420	8919.420	8983.686
17	Left	9986.567	454666.628	2324195.93	57.720	57.720	65	200	60	8.594	141.482	140.615	0.749	29.978	7.000	9270.425	9320.425	9386.712
18	Right	10353.946	455020.645	2324078.8	3.018	3.018	100	5000	0	0.000	263.402	131.731	0.000	0.000	2.500	9852.720	9912.720	10054.202
19	Right	11151.035	455766.46	2323800.17	40.445	40.445	100	400	120	8.594	162.356	207.855	1.499	59.955	7.000	10222.215	10282.215	10485.617
20	Left	11619.056	456032.938	2323414.16	48.444	48.444	80	240	90	10.743	112.921	153.550	1.404	44.947	7.000	10948.723	11008.723	11231.080
21	Left	12402.24	456798.913	2323246.26	14.317	14.317	65	200	60	0.000	199.898	100.472	0.000	0.000	2.500	11471.530	11531.530	11674.451
22	Right	12714.965	457112.337	2323260.87	29.949	29.949	65	700	20	0.819	305.901	197.240	0.024	10.000	2.683	12010.768	12070.768	12203.686
23	Right	13142.079	457500.063	2322779.07	12.653	12.653	80	500	50	2.865	60.414	80.454	0.208	24.998	5.688	12518.407	12578.407	12684.309
24	Left	13595.323	457851.529	2322309.69	1.495	1.495	100	10000	0	0.000	260.990	130.502	0.000	0.000	2.500	13061.835	13121.835	13172.249
25	Right	14226.762	458348.626	2322389.69	8.887	8.887	80	600	35	1.253	89.086	79.672	0.064	17.500	3.556	14142.173	14202.173	14271.259
26	Left	14807.1	458746.498	2321967.1	2.585	2.585	100	8000	0	0.000	270.663	135.354	0.000	0.000	2.500	14671.745	14731.745	14800.839
27	Right	15425.097	459189.11	2321535.73	1.556	1.556	100	10000	0	0.000	271.646	135.831	0.000	0.000	2.500	15289.267	15349.267	15418.351
28	Right	16017.385	459601.904	2321110.97	1.821	1.821	100	8000	0	0.000	254.240	127.131	0.000	0.000	2.500	15890.254	15950.254	16019.339
29	Left	16374.604	459942.609	2320847	5.055	5.055	100	3000	0	0.000	264.700	132.436	0.000	0.000	2.500	16242.168	16302.168	16371.253
30	Right	16804.539	460159.288	2320555.95	0.544	0.544	100	16000	0	0.000	151.989	76.000	0.000	0.000	2.500	16728.537	16788.537	16857.622
31	Left	17133.478	460401.344	2320333.3	15.544	15.544	80	500	50	2.865	85.647	93.269	0.208	24.998	5.688	17040.549	17100.549	17170.634
32	Left	17805.774	460995.967	2320019.28	2.258	2.258	100	5000	0	0.000	197.057	98.541	0.000	0.000	2.500	17707.233	17767.233	17837.318
33	Right	18335.118	461474.455	2319792.84	0.281	0.281	100	35000	0	0.000	171.636	85.818	0.000	0.000	2.500	18249.299	18309.299	18379.384
34	Left	18705.267	461808.247	2319632.84	0.295	0.295	100	30000	0	0.000	154.636	77.318	0.000	0.000	2.500	18627.949	18687.949	18758.034
35	Left	19129.378	462191.64	2319451.52	5.129	5.129	100	2000	0	0.000	179.043	89.581	0.000	0.000	2.500	19039.797	19099.797	19169.882
36	Left	19985.785	462995.573	2319156	0.621	0.621	100	20000	0	0.000	216.605	108.304	0.000	0.000	2.500	19877.483	19937.483	20007.568
37	Left	20556.071	463532.942	2318965.04	4.001	4.001	100	2200	0	0.000	153.631	76.847	0.000	0.000	2.500	20479.224	20539.224	20609.309
38	Right	21088.364	464045.783	2318822.23	5.648	5.648	100	1800	0	0.000	177.438	88.791	0.000	0.000	2.500	20999.573	21059.573	21129.658
39	Left	21487.244	464417.779	2318677.87	4.330	4.330	100	2500	0	0.000	188.911	94.501	0.000	0.000	2.500	21392.744	21452.744	21512.829
40	Right	23200.667	466057.466	2318180.32	3.732	3.732	100	2500	0	0.000	162.855	81.456	0.000	0.000	2.500	23119.211	23179.211	23239.296
41	Right	23703.881	466527.401	2318000.37	15.648	15.648	80	500	50	2.865	86.553	93.730	0.208	24.998	5.688	23660.497	23720.497	23780.582
42	Left	24331.036	467034.998	2317631.77	5.947	5.947	100	1800	0	0.000	186.824	93.496	0.000	0.000	2.500	24237.539	24297.539	24357.624
43	Left	24720.965	467371.761	2317434.87	1.119	1.119	100	8000	0	0.000	156.203	78.104	0.000	0.000	2.500	24642.860	24702.860	24762.945
44	Right	24969.905	467589.082	2317313.45	7.635	7.635	100	1800	0	0.000	239.857	120.106	0.000	0.000	2.500	24849.799	24909.799	24969.884
45	Right	25558.046	468060.129	2316960.68	0.246	0.246	100	35000	0	0.000	150.035	75.018	0.000	0.000	2.500	25483.029	25543.029	25603.114
46	Left	25833.118	468279.595	2316794.85	0.293	0.293	100	35000	0	0.000	179.017	89.509	0.000	0.000	2.500	25743.610	25803.610	25863.695
47	Left	26870.707	469112.254	2316175.83	12.902	12.902	100	800	55	1.970	125.139	117.969	0.158	27.489	5.556	26753.010	26813.010	26873.095
48	Left	27875.826	470030.384	2315766.3	0.273	0.273	100	35000	0	0.000	166.647	83.324	0.000	0.000	2.500	27792.503	27852.503	27912.588
49	Left	28339.119	470455.766	2315582.77	11.940	11.940	80	1000	45	1.289	163.392	127.083	0.084	22.500	2.844	28257.241	28317.241	28377.326
50	Right	29072.445	471173.257	2315429.75	13.713	13.713	80	500	50	2.865	69.668	85.144	0.208	24.998	5.688	28987.554	29047.554	29107.639



Corvan Construction S.A  
Contractor

Chief Engineer:  
Chief Engineer:  
Ward No. 10, P.O. Bhubaneswar, Odisha  
O/o the E.I.C. (Civil) Bhubaneswar

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**PROJECT:-**  
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE.

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**HORIZONTAL CURVE DETAILS**  
BHADRAK TO CHANDBALI - BALANCE WORK(SH-9, KM 0 TO 45)

DRG NO: 0897/CEG/2014/MS/01	DESIGNED BY: CHANBA BY	REV: 01	APPROVED
SH. NO. E	DATE: 0.01.13	REV: R1	CEG
SCALE	NTS		CEG
			EE, PMU
			CE, WBP

**HORIZONTAL CURVE DETAILS**

ORISSA STATE ROAD PROJECT (SH-9) BHADRAK TO CHANDBALI KM 0/000 TO 45/000

Curve No.	Curve Direction	HIP Details		Total Deflection Angle S	Total Deviation Angle Δ	Design Speed (Km/Hr) V	Curve Radius (m.) R <sub>c</sub>	Transition Length (m.) L <sub>s</sub>	Deviation Angle of Transition Curve Δ <sub>s</sub>	Circular Curve Length (m.) L <sub>c</sub>	Tangent Distance (m.) T <sub>s</sub>	Shift s	Straight Distance from TP to PC k	Superelevation (%) e	Transition Start Chainage TS	Circular Start Chainage SC	Circular End Chainage CS
		Eastings	Northings														
51	Left	29391.84	2315301.18	29.788	29.788	80	400	55	3.939	152.958	133.966	0.315	27.496	7.000	29259.415	29314.415	29467.373
52	Right	29898.787	2315303.79	63.168	63.168	80	490	110	6.431	430.218	356.869	1.028	54.977	5.805	29558.704	29668.704	30098.922
53	Right	30582.057	2314723.96	35.892	35.892	80	400	55	3.939	195.575	157.150	0.315	27.496	7.000	30407.273	30462.273	30657.848
54	Left	31236.364	2314047.36	12.480	12.480	80	500	50	2.865	58.908	59.691	0.208	24.998	5.689	31156.876	31206.876	31265.784
55	Left	32247.601	2313045.21	6.409	6.409	100	1800	0	0.000	201.351	100.781	0.000	0.000	2.500	32146.821	32146.821	32348.171
56	Right	32757.009	2312520.77	0.442	0.442	100	20000	0	0.000	154.142	77.071	0.000	0.000	2.500	32711.376	32711.376	32865.517
57	Left	33274.813	2312048.43	3.100	3.100	100	5000	0	0.000	270.553	135.309	0.000	0.000	2.500	33139.503	33139.503	33410.056
58	Right	34264.627	2311101.28	0.361	0.361	100	50000	0	0.000	315.996	157.698	0.000	0.000	2.500	34106.929	34106.929	34422.324
59	Left	34777.421	2310609.68	0.296	0.296	100	50000	0	0.000	258.381	129.191	0.000	0.000	2.500	34648.235	34648.235	34906.607
60	Right	35133.904	2310268.47	0.134	0.134	100	75000	0	0.000	175.587	87.794	0.000	0.000	2.500	35046.111	35046.111	35221.696
61	Left	36221.241	2309231.95	48.319	48.319	80	300	75	7.162	177.997	172.401	0.781	37.480	7.000	36054.537	36129.537	36307.533
62	Right	36842.663	2308953.05	8.124	8.124	80	1000	45	1.289	96.794	93.522	0.084	22.500	2.844	36749.228	36794.228	36891.022
63	Right	37327.443	2308678.4	37.343	37.343	80	500	90	5.157	235.980	214.180	0.675	44.988	5.689	37117.266	37207.266	37443.146
64	Right	37821.151	2308213.98	2.809	2.809	100	5000	0	0.000	245.112	122.581	0.000	0.000	2.500	37698.571	37698.571	37943.682
65	Left	38125.435	2307922.54	5.499	5.499	100	1800	0	0.000	172.740	86.437	0.000	0.000	2.500	38038.998	38038.998	38211.739
66	Right	38350.71	2307713.89	2.501	2.501	100	5000	0	0.000	218.222	109.128	0.000	0.000	2.500	38241.582	38241.582	38459.804
67	Right	39082.136	2307022.98	36.406	36.406	80	500	50	2.865	267.700	189.468	0.208	24.998	5.689	38894.994	38944.994	39212.694
68	Left	39389.106	2306720.57	1.092	1.092	100	10000	0	0.000	190.551	95.278	0.000	0.000	2.500	39293.828	39484.378	39823.184
69	Left	39706.814	2306414.12	9.483	9.483	80	500	50	2.865	32.753	66.486	0.208	24.998	5.689	39640.431	39690.431	39723.184
70	Right	39947.289	2306175.2	1.185	1.185	100	12000	0	0.000	248.099	124.054	0.000	0.000	2.500	39823.236	39823.236	40071.333
71	Right	40349.14	2305776.58	7.923	7.923	80	1200	0	0.000	165.946	83.105	0.000	0.000	2.500	40266.035	40266.035	40431.981
72	Right	41145.309	2305008.76	13.970	13.970	80	500	50	2.865	71.908	86.281	0.208	24.998	5.689	41059.293	41109.293	41181.201
73	Left	41697.692	2304521.58	32.003	32.003	80	400	60	4.297	163.420	144.810	0.375	29.994	7.000	41554.826	41614.826	41778.246
74	Left	42084.829	2304133.28	28.409	28.409	80	300	75	7.162	73.750	113.615	0.781	37.480	7.000	41972.767	42047.767	42121.517
75	Right	42377.413	2303875.97	25.111	25.111	80	300	75	7.162	56.483	104.469	0.781	37.480	7.000	42274.088	42349.088	42405.571
76	Right	42793.651	2303462.99	0.759	0.759	80	12000	0	0.000	159.052	79.527	0.000	0.000	2.500	42714.125	42714.125	42873.175
77	Right	43140.177	2303117.82	12.427	12.427	80	500	50	2.865	58.446	79.457	0.208	24.998	5.689	43060.921	43110.921	43169.367
78	Left	43524.337	2302735.99	14.714	14.714	80	500	50	2.865	78.402	89.581	0.208	24.998	5.689	43435.055	43485.055	43563.458
79	Right	44454.6	2301813.29	13.735	13.735	80	600	40	1.910	103.832	92.275	0.111	19.999	4.741	44362.554	44402.554	44506.386
80	Right	45059.083	2301211.75	0.085	0.085	100	100000	0	0.000	148.741	74.370	0.000	0.000	2.500	44984.722	44984.722	45133.444
81	Right	45722.055	2300552.61	0.247	0.247	100	50000	0	0.000	215.257	107.629	0.000	0.000	2.500	45614.423	45614.423	45829.687
82	Right	46133.912	2300143.33	3.370	3.370	100	3000	0	0.000	176.478	88.264	0.000	0.000	2.500	46045.648	46045.648	46222.125
83	Right	47259.176	2299036.16	33.994	33.994	80	700	65	2.660	350.312	246.544	0.251	32.498	4.063	47080.270	47080.270	47430.582
84	Left	48740.771	2297954.66	7.460	7.460	100	1800	0	0.000	234.370	117.351	0.000	0.000	2.500	48623.421	48623.421	48857.790
85	Right	49214.765	2297572.47	5.750	5.750	100	1800	0	0.000	180.646	90.399	0.000	0.000	2.500	49124.367	49124.367	49305.012
86	Right	49742.203	2297180.8	4.225	4.225	100	1800	0	0.000	132.738	66.399	0.000	0.000	2.500	49675.804	49675.804	49808.543
87	Right	50017.827	2296994.12	24.915	24.915	65	200	60	8.594	26.970	74.326	0.749	29.978	7.000	49944.322	50004.322	50031.292
88	Right	50397.927	2296871.28	22.718	22.718	65	200	60	8.594	19.302	70.307	0.749	29.978	7.000	50328.269	50388.269	50407.571
89	Left	50638.899	2296880.13	22.135	22.135	65	500	35	2.005	158.162	115.319	0.102	17.499	3.756	50524.142	50559.142	50717.096
90	Left	51172.891	2296706.29	44.781	44.781	65	200	60	8.594	96.314	112.682	0.749	29.978	7.000	51063.781	51123.781	51220.093
91	Right	51547.212	2296381.8	45.481	45.481	65	200	60	8.594	98.758	114.119	0.749	29.978	7.000	51436.805	51496.805	51595.562
92	Left	51917.811	2296235.77	87.876	87.876	65	155	70	12.938	167.726	185.564	1.315	34.941	7.000	51754.678	51824.678	51992.404
01	Left	376.044	446964.9	5.378	5.378	100	20000	0	0	32.753	16.376	0	0	2.500	359.668	359.668	392.420
02	Left	776.541	446741.6	17.241	17.241	100	5000	0	0	25.245	12.622	0	0	2.500	763.918	763.918	789.163

CURVE DETAILS FOR CONNECTING ROAD BETWEEN SH-9 AND NH-5

**PROJECT:-**

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE.

**CONSULTING ENGINEER, WBPROUP LTD.**

E-12, Mofl Colony, Mahatma Nagar, Jajpur-17  
Tel: +91-141-2520895, 2521899, 2520556  
Fax: 2521348, e-mail: ceg@ceginia.com



**HORIZONTAL CURVE DETAILS**

BHADRAK TO CHANDBALI. -BALANCE WORK(SH-9, KM 0 TO 45)

DRG. NO. /	DATE: 16.01.13	REV: R1	DESIGNED BY: CEG	DRAWN BY: CEG	APPROVED: EE, PMU
SH. NO. /	F	SCALE	CEG	CEG	CE, WBP

VERTICAL CURVE DETAILS

Curve No.	Curve Type	VIP Details		Curve Length m.	k	Curve Start		Curve End		Start Gradient (%)	End Gradient (%)	Grade Difference (%)	Remarks
		Chainage	Level			Chainage	Level	Chainage	Level				
1	Valley	123.746	19.088	60	210.786	93.746	19.2	153.746	19.062	-0.373	-0.285		
2	Valley	824.882	18.469	60	144.338	794.882	18.496	854.882	18.496	0.327	-0.415		
3	Summit	977.863	18.97	60	183.281	947.863	18.872	1007.863	18.97	0	0.327		
4	Summit	1069.834	18.97	75	154.853	1032.334	18.97	1107.334	18.788	0	-0.484		
5	Valley	1280.485	17.95	60	138.327	1250.485	18.095	1310.485	17.935	-0.484	-0.433		
6	Valley	1715	17.73	60	1186.36	1685	17.745	1745	17.73	-0.051	-0.005		
7	Summit	1848.019	17.73	60	958.628	1818.019	17.73	1878.019	17.711	0	-0.063	0.063	
8	Valley	2153.747	17.539	60	476.689	2123.747	17.557	2183.747	17.558	-0.063	-0.126		
9	Summit	2523.327	17.773	60	324.776	2493.327	17.754	2553.327	17.736	0.063	-0.121	0.184	
10	Valley	2983.04	17.214	60	96.362	2953.04	17.251	3013.04	17.364	-0.121	-0.501	-0.622	
11	Summit	3187.73	18.24	70	139.669	3152.73	18.065	3222.73	18.24	0.501	0	0.501	
12	Summit	3299.53	18.24	100	149.469	3249.53	18.24	3349.53	17.903	0	-0.674	0.674	
13	Valley	3587.56	16.3	60	89.081	3557.56	16.502	3617.56	16.3	-0.674	0	-0.674	
14	Summit	3850	16.3	60	438.534	3820	16.3	3880	16.259	0	-0.137	0.137	
15	Valley	4142.356	15.9	60	629.307	4112.356	15.941	4172.356	15.868	-0.137	-0.041	-0.096	
16	Summit	4383.456	15.8	60	389.315	4353.456	15.812	4413.456	15.741	-0.041	-0.196	0.195	
17	Valley	4671.385	15.237	60	217.285	4641.385	15.296	4701.385	15.261	-0.196	-0.081	-0.277	
18	Summit	4888.046	15.411	60	196.875	4858.046	15.387	4918.046	15.344	0.081	-0.224	0.305	
19	Valley	5138.397	14.85	60	249.396	5108.397	14.917	5168.397	14.855	-0.224	-0.016	-0.240	
20	Summit	5319.811	14.88	60	1049.28	5289.811	14.875	5349.811	14.867	0.016	-0.041	0.057	
21	Valley	5760	14.7	60	1033.4	5730	14.712	5790	14.705	-0.041	0.017	-0.058	
22	Summit	6050	14.75	60	3480	6020	14.745	6080	14.75	0.017	0	0.017	
23	Summit	6200	14.75	60	425.814	6170	14.75	6230	14.708	0	-0.141	0.141	
24	Valley	6582.017	14.24	60	881.339	6552.017	14.282	6592.017	14.218	-0.141	-0.073	-0.068	
25	Summit	6929.859	13.972	60	1277.48	6899.859	13.984	6959.859	13.936	-0.073	-0.12	0.047	
26	Valley	7318.229	13.507	60	1611.01	7288.229	13.543	7348.229	13.482	-0.12	-0.083	-0.037	
27	Valley	7847.285	13.07	60	2392.24	7817.285	13.095	7877.285	13.053	-0.083	-0.057	-0.026	
28	Summit	8250.386	12.838	60	1116.99	8220.386	12.856	8280.386	12.805	-0.057	-0.111	0.054	
29	Valley	9094.308	11.9	60	539.631	9064.308	11.933	9124.308	11.914	0	-0.111	0	
30	Valley	9306.509	11.9	60	1259.9	9276.509	11.9	9336.509	11.914	0	0.048	-0.048	
31	Summit	9542.789	12.013	60	778.816	9512.789	11.998	9572.789	12.004	0.048	-0.029	0.077	
32	Summit	9925.295	11.9	60	251.042	9895.295	11.909	9955.295	11.819	-0.029	-0.268	0.238	
33	Valley	10540	10.25	60	306.04	10510	10.331	10570	10.228	-0.268	-0.072	-0.186	
34	Valley	11289.112	9.722	60	176.255	11259.112	9.744	11289.112	9.603	-0.072	-0.268	-0.340	
35	Summit	11450.886	10.21	60	151.827	11420.886	10.129	11480.886	10.171	0.268	-0.127	0.395	
36	Valley	11665.742	9.936	60	354.412	11635.742	9.975	11695.742	9.949	-0.127	-0.042	-0.169	
37	Summit	11982.58	10.07	60	320.731	11952.58	10.057	12012.58	10.027	0.042	-0.145	0.187	
38	Valley	12849.623	8.814	60	280.037	12819.623	8.857	12879.623	8.834	-0.145	-0.068	-0.214	
39	Summit	13118.579	9	60	256.591	13088.579	8.979	13148.579	8.951	0.069	-0.164	0.233	
40	Valley	13361.748	8.6	60	290.603	13331.748	8.649	13391.748	8.613	-0.164	0.042	-0.206	
41	Summit	13660	8.7	60	1429.51	13570	8.687	13630	8.7	0.042	0	0.042	
42	Summit	13900	8.7	60	2000	13870	8.7	13930	8.691	0	-0.03	0.030	
43	Summit	14370	8.559	60	4409.2	14340	8.568	14400	8.546	-0.03	-0.044	0.014	
44	Valley	14821.753	8.362	60	358.057	14791.753	8.375	14851.753	8.399	0.044	-0.124	-0.168	
45	Summit	15146.676	8.765	60	313.568	15116.676	8.728	15176.676	8.745	-0.044	-0.067	0.191	
46	Summit	15450.562	8.56	60	539.051	15420.562	8.58	15480.562	8.506	-0.067	-0.179	0.112	
47	Valley	15783.963	8	60	335.777	15753.963	8.054	15793.963	8	-0.179	0	-0.179	
48	Valley	16100	8	60	473.374	16070	8	16130	8.038	0	0.127	-0.127	
49	Summit	16494.478	8.5	60	608.086	16464.478	8.462	16524.478	8.508	0.127	-0.028	0.099	
50	Summit	17039.359	8.653	60	348.558	17009.359	8.645	17069.359	8.61	0.028	-0.144	0.172	
51	Valley	17353.815	8.2	60	563.32	17323.815	8.243	17383.815	8.189	-0.144	-0.038	-0.106	
52	Summit	17886.483	8	60	301.617	17856.483	8.011	17916.483	7.929	-0.038	-0.236	0.198	
53	Valley	18090.56	7.541	60	140.832	18050.56	7.612	18110.56	7.598	-0.236	0.19	-0.426	
54	Summit	18417.617	8.18	60	226.19	18387.617	8.123	18447.617	8.157	0.19	-0.076	0.286	
55	Valley	18762.406	7.919	60	205.762	18732.406	7.942	18792.406	7.984	-0.076	-0.216	-0.292	
56	Summit	19137.955	8.73	60	148.604	19107.955	8.665	19167.955	8.673	0.216	-0.188	0.404	
57	Valley	19499.987	8.106	60	381.177	19469.987	8.162	19529.987	8.097	-0.188	-0.03	-0.158	
58	Summit	19818.35	8	60	322.741	19788.35	8.009	19848.35	8.047	-0.03	0.155	-0.185	
59	Summit	20139.978	8.5	60	229.69	20109.978	8.453	20169.978	8.468	0.155	-0.106	0.261	
60	Valley	20915.115	7.68	60	547.007	20885.115	7.712	20945.115	7.681	-0.106	0.004	-0.110	
61	Valley	21419.641	7.7	60	2037.56	21389.641	7.699	21449.641	7.71	0.004	0.033	-0.029	
62	Valley	21733.342	7.805	60	630.13	21703.342	7.795	21763.342	7.843	0.033	0.129	-0.096	
63	Summit	22419.225	8.687	60	295.497	22389.225	8.646	22449.225	8.664	0.129	-0.074	0.203	

PROJECT:-

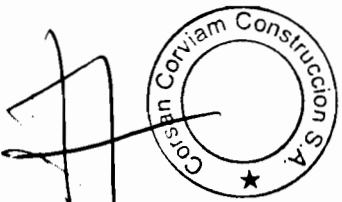
ODISHA STATE ROAD PROJECT UNDER  
WORLD BANK ASSISTANCE.

**CONSULTING ENGINEER, WBPROUP LTD.**  
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VERTICAL CURVE DETAILS  
BHADRAK TO CHANDBALI. -BALANCE WORK(SH-9, KM 0 TO 45)

DRG. NO. CESP/CEG/SH-9/KM 01	DESIGNED BY	DRAWN BY	REV/1	APPROVED
SH. NO. G	DATE	01.13	REV	R1
SCALE	NTS			
	CEG	CEG	EE, PMU	CE, WBP



VERTICAL CURVE DETAILS

Curve No.	Curve Type	VIP Details		Curve Length m.	k	Curve Start		Curve End		Start Gradient (%)	End Gradient (%)	Grade Difference (%)	Remarks
		Chainage	Level			Chainage	Level	Chainage	Level				
64	Valley	23140	8.15	60	619.545	23110	8.172	23170	8.157	0.074	0.022	-0.086	
65	Summit	23747.27	8.202	60	561.376	23444.27	9.196	23404.27	9.177	0.022	-0.084	0.106	
66	Valley	24143.201	7.553	60	591.195	24113.201	7.578	24173.201	7.558	-0.084	0.017	-0.101	
67	Summit	24562.312	7.624	60	636.768	24532.312	7.619	24592.312	7.608	0.017	-0.055	0.072	
68	Valley	25041.046	7.362	60	631.964	25011.046	7.379	25071.046	7.374	-0.055	0.04	-0.095	
69	Summit	25430.303	7.519	60	1977.78	25400.303	7.507	25460.303	7.522	0.04	0.01	0.030	
70	Valley	25730	7.549	60	1040.11	25700	7.546	25760	7.569	0.01	0.068	-0.058	
71	Summit	25988.623	7.725	60	1375.5	25958.623	7.704	26018.623	7.732	0.068	0.024	0.044	
72	Summit	26302.676	7.8	60	1871.6	26272.676	7.793	26332.676	7.798	0.024	-0.008	0.032	
73	Summit	26664.99	7.771	60	2458.7	26634.99	7.773	26694.99	7.761	-0.008	-0.032	0.024	
74	Valley	27217.336	7.592	60	2750.25	27187.336	7.602	27247.336	7.589	-0.032	-0.011	-0.021	
75	Valley	27600	7.551	60	242.405	27570	7.555	27630	7.623	-0.011	0.237	-0.248	
76	Summit	27875.155	8.203	60	187.501	27845.155	8.132	27905.155	8.178	0.237	-0.083	0.320	
77	Valley	28120	8	60	722.282	28090	8.025	28150	8	-0.083	0	-0.083	
78	Valley	28300	8	60	1200	28270	8	28330	8.015	0	0.05	-0.050	
79	Summit	28700	8.2	60	372.61	28670	8.165	28730	8.167	0.05	-0.111	0.161	
80	Valley	29066.58	7.793	60	240.012	29036.58	7.826	29096.58	7.835	-0.111	0.139	-0.250	
81	Summit	29254.482	8.054	60	205.907	29224.482	8.012	29284.482	8.008	0.139	-0.152	0.291	
82	Valley	29710	7.36	60	250.347	29680	7.406	29740	7.386	-0.152	0.087	-0.239	
83	Summit	30100	7.7	60	587.798	30070	7.674	30130	7.7	0.087	0	0.087	
84	Summit	30400	7.7	60	767.969	30370	7.7	30430	7.677	0	-0.078	0.078	
85	Valley	30779.924	7.403	60	167.297	30749.924	7.427	30809.924	7.512	-0.078	0.362	-0.440	
86	Summit	31075.068	8.2	60	165.708	30970	8.091	31030	8.2	0.362	0	0.362	
87	Summit	31675.068	8.2	60	412.397	31645.068	8.2	31705.068	8.196	0	-0.145	0.145	
88	Valley	31950	7.8	60	412.397	31920	7.844	31980	7.8	-0.145	0	-0.145	
89	Valley	32193.389	7.8	60	4032.77	32163.389	7.844	32223.389	7.804	0	0.015	-0.015	
90	Valley	32935.451	7.91	60	1765.39	32905.451	7.906	32965.451	7.925	0.015	0.049	-0.034	
91	Valley	33218.804	8.049	60	1417.25	33188.804	8.034	33248.804	8.076	0.049	0.091	-0.042	
92	Summit	33494.171	8.3	60	657.893	33464.171	8.273	33524.171	8.3	0.091	0	0.091	
93	Summit	34070.173	8.3	60	719.657	34040.173	8.3	34100.173	8.275	0	-0.083	0.083	
94	Valley	34493.145	7.947	60	281.95	34463.145	7.972	34523.145	7.986	-0.083	0.13	-0.213	
95	Summit	34750	8.28	60	463.298	34720	8.241	34780	8.28	0.13	0	0.130	
96	Valley	35050	8.28	60	985.714	35020	8.28	35080	8.28	0	0.061	-0.061	
97	Summit	35740	8.7	60	985.714	35710	8.682	35770	8.7	0.061	0	0.061	
98	Summit	35900	8.7	60	391.722	35870	8.7	35930	8.654	0	-0.153	0.153	
99	Valley	36357.009	8	60	159.651	36327.009	8.046	36387.009	8.067	-0.153	0.223	-0.376	
100	Summit	36779.355	8.94	75	212.864	36749.355	8.857	36819.355	8.892	0.223	-0.13	0.353	
101	Valley	37273.118	8.3	60	910.46	37243.118	8.339	37303.118	8.281	-0.13	-0.064	-0.066	
102	Valley	37686.66	8.036	60	102.754	37656.66	8.055	37716.66	8.192	-0.064	0.52	-0.584	
103	Summit	37902.719	9.16	60	153.808	37862.719	8.952	37942.719	9.16	0.52	0	0.520	
104	Summit	38400	9.16	60	206.626	38370	9.16	38430	9.073	0	-0.29	0.290	
105	Valley	38644.507	8.45	60	174.903	38614.507	8.537	38674.507	8.466	-0.29	0.053	-0.343	
106	Valley	38934.38	8.55	60	265.457	38904.38	8.534	38964.38	8.634	0.053	0.279	-0.226	
107	Summit	39099.52	8.299	70	150.994	39064.52	9.191	39134.52	9.224	0.279	-0.185	0.464	
108	Valley	39418.027	8.7	60	162.716	39388.027	8.755	39448.027	8.755	-0.185	0.184	-0.369	
109	Summit	39633.068	9.1	60	207.377	39603.068	9.045	39663.068	9.088	0.184	-0.108	0.289	
110	Valley	40068.333	8.913	60	335.356	40038.333	9.078	40098.333	9.014	-0.108	0.073	-0.178	
111	Summit	40343.464	8.309	60	166.169	40313.464	8.346	40373.464	8.346	-0.288	0.126	-0.414	
112	Valley	40672.888	8.723	60	145.171	40642.888	8.685	40702.888	8.766	0.126	0.147	-0.021	
113	Summit	41124.316	9.384	60	291.044	41094.316	9.34	41154.316	9.366	0.147	-0.060	0.207	
114	Valley	41682.832	9.051	60	375.976	41652.832	9.069	41712.832	9.081	-0.060	0.100	-0.160	
115	Summit	42156.724	9.525	60	190.085	42126.724	9.495	42186.724	9.46	0.100	-0.216	0.316	
116	Valley	42400	9	60	278.182	42370	9.065	42430	9	-0.216	0.000	-0.216	
117	Summit	42670	9	60	2685.07	42640	9	42700	8.993	0.000	-0.022	0.022	
118	Valley	42913.013	8.923	60	2154.46	42883.013	8.93	42943.013	8.925	-0.022	0.006	-0.028	
119	Valley	43271.982	8.943	60	397.343	43241.982	8.941	43301.982	8.99	0.006	0.157	-0.151	
120	Summit	43500	9.3	60	383.371	43470	9.253	43530	9.3	0.157	0.000	0.157	
121	Summit	43650	9.3	60	140.013	43620	9.3	43680	9.171	0.000	-0.429	0.429	
122	Valley	43860.02	8.4	60	196.884	43830.02	8.529	43890.02	8.363	-0.429	-0.124	-0.305	
123	Valley	44160.493	8.028	60	406.47	44130.493	8.065	44190.493	8.035	-0.124	0.024	-0.148	
124	Valley	44432.373	8.093	60	296.611	44402.373	8.096	44462.373	8.161	0.024	0.226	-0.202	
125	Summit	44833.564	9	70	167.356	44798.564	8.921	44868.564	8.933	0.226	-0.192	0.418	
127	Valley	45197.852	8.3	60	412.544	45167.852	8.358	45227.852	8.286	-0.192	-0.047	-0.145	
01	Valley	237480	19.573	75	43.098	199.980	19.659	274.980	20.341	0.039	1.78	1.819	
02	Summit	390.703	22.4	110	61.813	335.703	21.421	445.703	22.400	1.78	0	1.78	
03	Summit	547.597	22.4	80	61.082	507.597	22.4	587.597	21.875	0	-1.31	1.31	
04	Valley	733.977	19.959	60	47.893	703.977	20.352	763.977	19.942	-1.31	-0.057	-1.367	

PROJECT:-

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE.

VERTICAL CURVE DETAILS

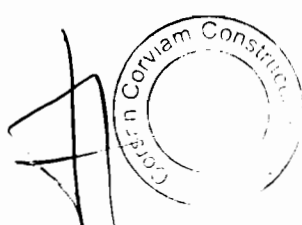
BHADRAK TO CHANDBALI. -BALANCE WORK(SH-9, KM 0 TO 45)

DRG. NO. / CORR/CEG/SH-9/KC/02	DESIGNED BY	DRAWN BY	REV/RT	APPROVED
SH. NO. H	DATE	18.01.13	REV	RT
SCALE	NTS		CEG	CEG
			EE, PMU	CE, WBP

**CONSULTING ENGINEER, WBP GROUP LTD.**  
E-12, Moj Colony, Malviya Nagar, Jaipur-17  
Tel: +91-141-2520899, 2521899, 2520556  
Fax: 2521348, e-mail: ceg@ceginfia.com



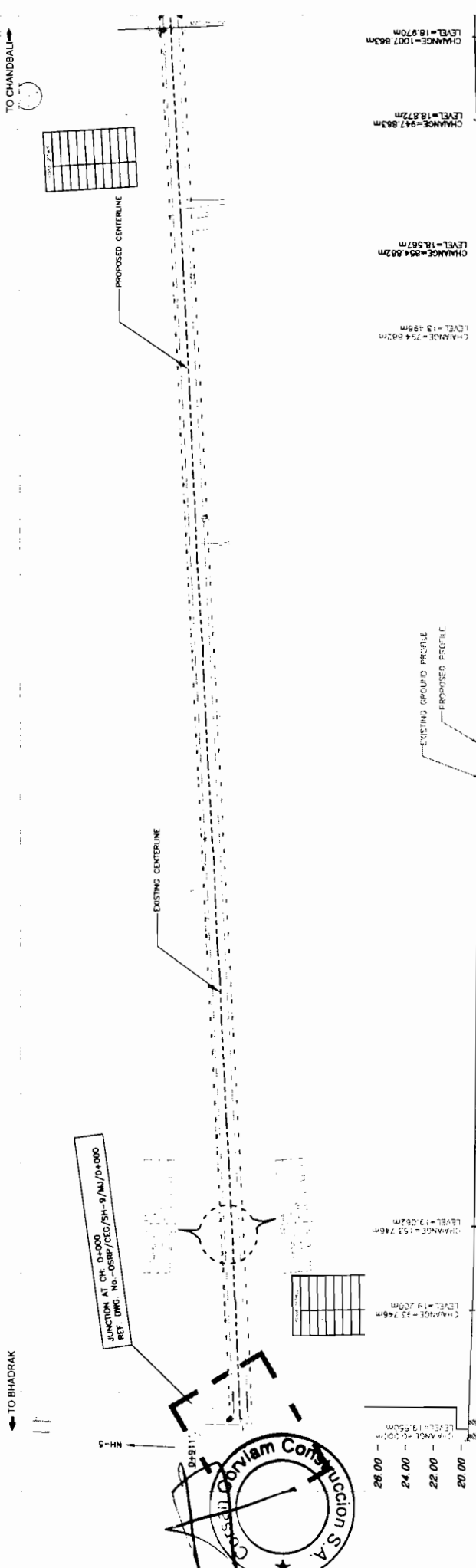
Chief Engineer  
World Bank Project  
O/o the E.C.O. (W/P), Odisha  
Bhubaneswar



Corvan Construction S.A.  
Contractor

TO BHADRAK

TO CHANDBALI



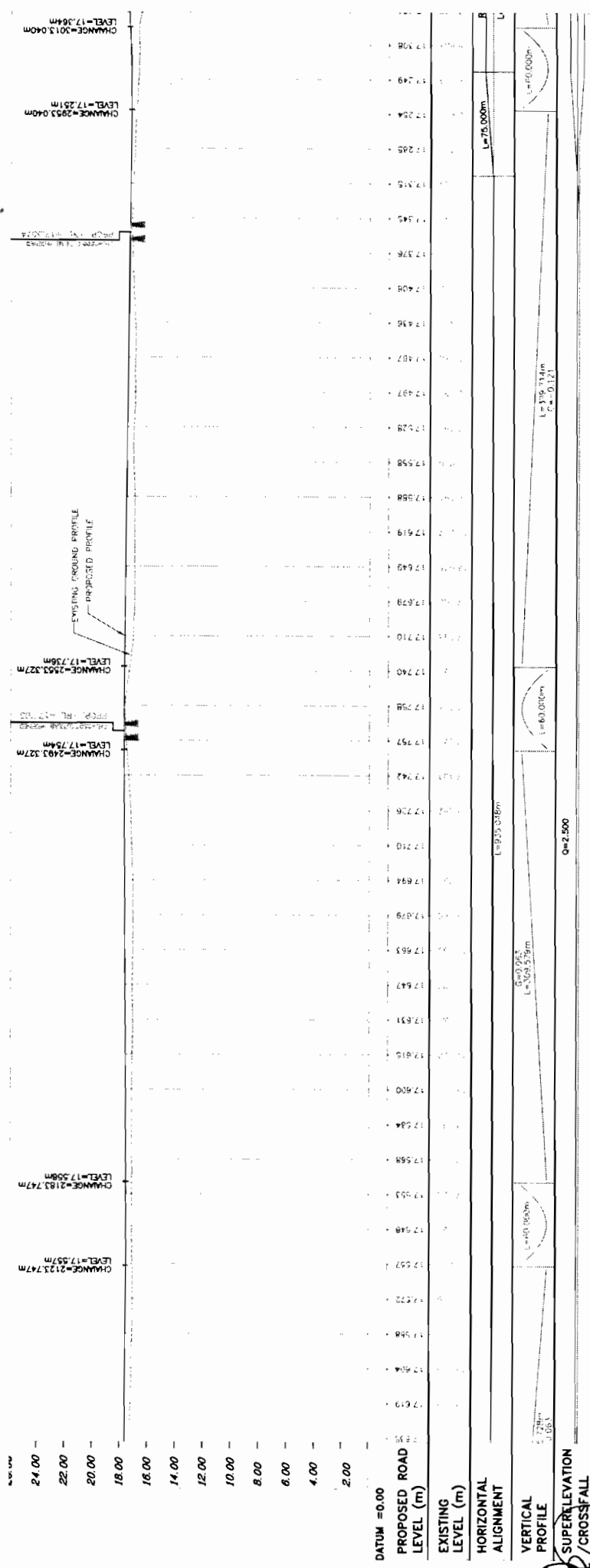
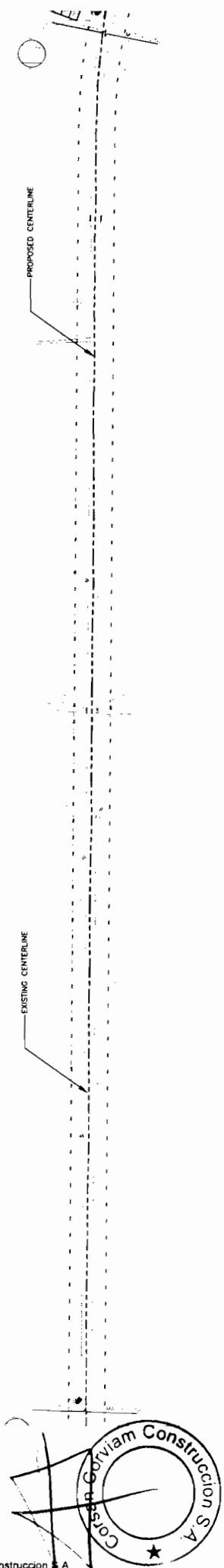
Stationing	Proposed Road Level (m)	Existing Level (m)	Vertical Profile	Horizontal Alignment
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19.550	19.550	19.550		
19.600	19.600	19.600	L=60.030m C=0.077	L=852.463m
19.650	19.650	19.650		
19.700	19.700	19.700	L=60.030m C=0.077	L=852.463m
19.750	19.750	19.750		
19.800	19.800	19.800	L=60.030m C=0.077	L=852.463m
19.850	19.850	19.850		
19.900	19.900	19.900	L=60.030m C=0.077	L=852.463m
19.950	19.950	19.950		
20.000	20.000	20.000	L=60.030m C=0.077	L=852.463m
20.050	20.050	20.050		
20.100	20.100	20.100	L=60.030m C=0.077	L=852.463m
20.150	20.150	20.150		
20.200	20.200	20.200	L=60.030m C=0.077	L=852.463m
20.250	20.250	20.250		
20.300	20.300	20.300	L=60.030m C=0.077	L=852.463m
20.350	20.350	20.350		
20.400	20.400	20.400	L=60.030m C=0.077	L=852.463m
20.450	20.450	20.450		
20.500	20.500	20.500	L=60.030m C=0.077	L=852.463m
20.550	20.550	20.550		
20.600	20.600	20.600	L=60.030m C=0.077	L=852.463m
20.650	20.650	20.650		
20.700	20.700	20.700	L=60.030m C=0.077	L=852.463m
20.750	20.750	20.750		
20.800	20.800	20.800	L=60.030m C=0.077	L=852.463m
20.850	20.850	20.850		
20.900	20.900	20.900	L=60.030m C=0.077	L=852.463m
20.950	20.950	20.950		
21.000	21.000	21.000	L=60.030m C=0.077	L=852.463m
21.050	21.050	21.050		
21.100	21.100	21.100	L=60.030m C=0.077	L=852.463m
21.150	21.150	21.150		
21.200	21.200	21.200	L=60.030m C=0.077	L=852.463m
21.250	21.250	21.250		
21.300	21.300	21.300	L=60.030m C=0.077	L=852.463m
21.350	21.350	21.350		
21.400	21.400	21.400	L=60.030m C=0.077	L=852.463m
21.450	21.450	21.450		
21.500	21.500	21.500	L=60.030m C=0.077	L=852.463m
21.550	21.550	21.550		
21.600	21.600	21.600	L=60.030m C=0.077	L=852.463m
21.650	21.650	21.650		
21.700	21.700	21.700	L=60.030m C=0.077	L=852.463m
21.750	21.750	21.750		
21.800	21.800	21.800	L=60.030m C=0.077	L=852.463m
21.850	21.850	21.850		
21.900	21.900	21.900	L=60.030m C=0.077	L=852.463m
21.950	21.950	21.950		
22.000	22.000	22.000	L=60.030m C=0.077	L=852.463m
22.050	22.050	22.050		
22.100	22.100	22.100	L=60.030m C=0.077	L=852.463m
22.150	22.150	22.150		
22.200	22.200	22.200	L=60.030m C=0.077	L=852.463m
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22.350	22.350	22.350		
22.400	22.400	22.400	L=60.030m C=0.077	L=852.463m
22.450	22.450	22.450		
22.500	22.500	22.500	L=60.030m C=0.077	L=852.463m
22.550	22.550	22.550		
22.600	22.600	22.600	L=60.030m C=0.077	L=852.463m
22.650	22.650	22.650		
22.700	22.700	22.700	L=60.030m C=0.077	L=852.463m
22.750	22.750	22.750		
22.800	22.800	22.800	L=60.030m C=0.077	L=852.463m
22.850	22.850	22.850		
22.900	22.900	22.900	L=60.030m C=0.077	L=852.463m
22.950	22.950	22.950		
23.000	23.000	23.000	L=60.030m C=0.077	L=852.463m
23.050	23.050	23.050		
23.100	23.100	23.100	L=60.030m C=0.077	L=852.463m
23.150	23.150	23.150		
23.200	23.200	23.200	L=60.030m C=0.077	L=852.463m
23.250	23.250	23.250		
23.300	23.300	23.300	L=60.030m C=0.077	L=852.463m
23.350	23.350	23.350		
23.400	23.400	23.400	L=60.030m C=0.077	L=852.463m
23.450	23.450	23.450		
23.500	23.500	23.500	L=60.030m C=0.077	L=852.463m
23.550	23.550	23.550		
23.600	23.600	23.600	L=60.030m C=0.077	L=852.463m
23.650	23.650	23.650		
23.700	23.700	23.700	L=60.030m C=0.077	L=852.463m
23.750	23.750	23.750		
23.800	23.800	23.800	L=60.030m C=0.077	L=852.463m
23.850	23.850	23.850		
23.900	23.900	23.900	L=60.030m C=0.077	L=852.463m
23.950	23.950	23.950		
24.000	24.000	24.000	L=60.030m C=0.077	L=852.463m
24.050	24.050	24.050		
24.100	24.100	24.100	L=60.030m C=0.077	L=852.463m
24.150	24.150	24.150		
24.200	24.200	24.200	L=60.030m C=0.077	L=852.463m
24.250	24.250	24.250		
24.300	24.300	24.300	L=60.030m C=0.077	L=852.463m
24.350	24.350	24.350		
24.400	24.400	24.400	L=60.030m C=0.077	L=852.463m
24.450	24.450	24.450		
24.500	24.500	24.500	L=60.030m C=0.077	L=852.463m
24.550	24.550	24.550		
24.600	24.600	24.600	L=60.030m C=0.077	L=852.463m
24.650	24.650	24.650		
24.700	24.700	24.700	L=60.030m C=0.077	L=852.463m
24.750	24.750	24.750		
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25.000	25.000	25.000	L=60.030m C=0.077	L=852.463m
25.050	25.050	25.050		
25.100	25.100	25.100	L=60.030m C=0.077	L=852.463m
25.150	25.150	25.150		
25.200	25.200	25.200	L=60.030m C=0.077	L=852.463m
25.250	25.250	25.250		
25.300	25.300	25.300	L=60.030m C=0.077	L=852.463m
25.350	25.350	25.350		
25.400	25.400	25.400	L=60.030m C=0.077	L=852.463m
25.450	25.450	25.450		
25.500	25.500	25.500	L=60.030m C=0.077	L=852.463m
25.550	25.550	25.550		
25.600	25.600	25.600	L=60.030m C=0.077	L=852.463m
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25.700	25.700	25.700	L=60.030m C=0.077	L=852.463m
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25.800	25.800	25.800	L=60.030m C=0.077	L=852.463m
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26.700	26.700	26.700	L=60.030m C=0.077	L=852.463m
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27.050	27.050	27.050		
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27.250	27.250	27.250		
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27.350	27.350	27.350		
27.400	27.400	27.400	L=60.030m C=0.077	L=852.463m
27.450	27.450	27.450		
27.500	27.500	27.500	L=60.030m C=0.077	L=852.463m
27.550	27.550	27.550		
27.600	27.600	27.600	L=60.030m C=0.077	L=852.463m





TO BHADRAK

TO CHANDBALI



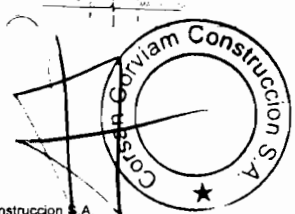
STATIONING	EXISTING ROAD LEVEL (m)	PROPOSED ROAD LEVEL (m)	CHANGING
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2100.000	17.619	17.619	
2110.000	17.631	17.631	
2120.000	17.647	17.647	
2130.000	17.663	17.663	
2140.000	17.679	17.679	
2150.000	17.694	17.694	
2160.000	17.710	17.710	
2170.000	17.726	17.726	
2180.000	17.742	17.742	
2190.000	17.758	17.758	
2200.000	17.774	17.774	
2210.000	17.790	17.790	
2220.000	17.806	17.806	
2230.000	17.822	17.822	
2240.000	17.838	17.838	
2250.000	17.854	17.854	
2260.000	17.870	17.870	
2270.000	17.886	17.886	
2280.000	17.902	17.902	
2290.000	17.918	17.918	
2300.000	17.934	17.934	
2310.000	17.950	17.950	
2320.000	17.966	17.966	
2330.000	17.982	17.982	
2340.000	17.998	17.998	
2350.000	18.014	18.014	
2360.000	18.030	18.030	
2370.000	18.046	18.046	
2380.000	18.062	18.062	
2390.000	18.078	18.078	
2400.000	18.094	18.094	
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2450.000	18.174	18.174	
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2480.000	18.222	18.222	
2490.000	18.238	18.238	
2500.000	18.254	18.254	
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2590.000	18.398	18.398	
2600.000	18.414	18.414	
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2620.000	18.446	18.446	
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2650.000	18.494	18.494	
2660.000	18.510	18.510	
2670.000	18.526	18.526	
2680.000	18.542	18.542	
2690.000	18.558	18.558	
2700.000	18.574	18.574	
2710.000	18.590	18.590	
2720.000	18.606	18.606	
2730.000	18.622	18.622	
2740.000	18.638	18.638	
2750.000	18.654	18.654	
2760.000	18.670	18.670	
2770.000	18.686	18.686	
2780.000	18.702	18.702	
2790.000	18.718	18.718	
2800.000	18.734	18.734	
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2860.000	18.830	18.830	
2870.000	18.846	18.846	
2880.000	18.862	18.862	
2890.000	18.878	18.878	
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2930.000	18.942	18.942	
2940.000	18.958	18.958	
2950.000	18.974	18.974	
2960.000	18.990	18.990	
2970.000	19.006	19.006	
2980.000	19.022	19.022	
2990.000	19.038	19.038	
3000.000	19.054	19.054	

**CONSULTING PROJECT:**  
**ENGINEERING, WBPROUP LTD.**

ORISSA STATE ROAD PROJECT  
 UNDER WORLD BANK ASSISTANCE

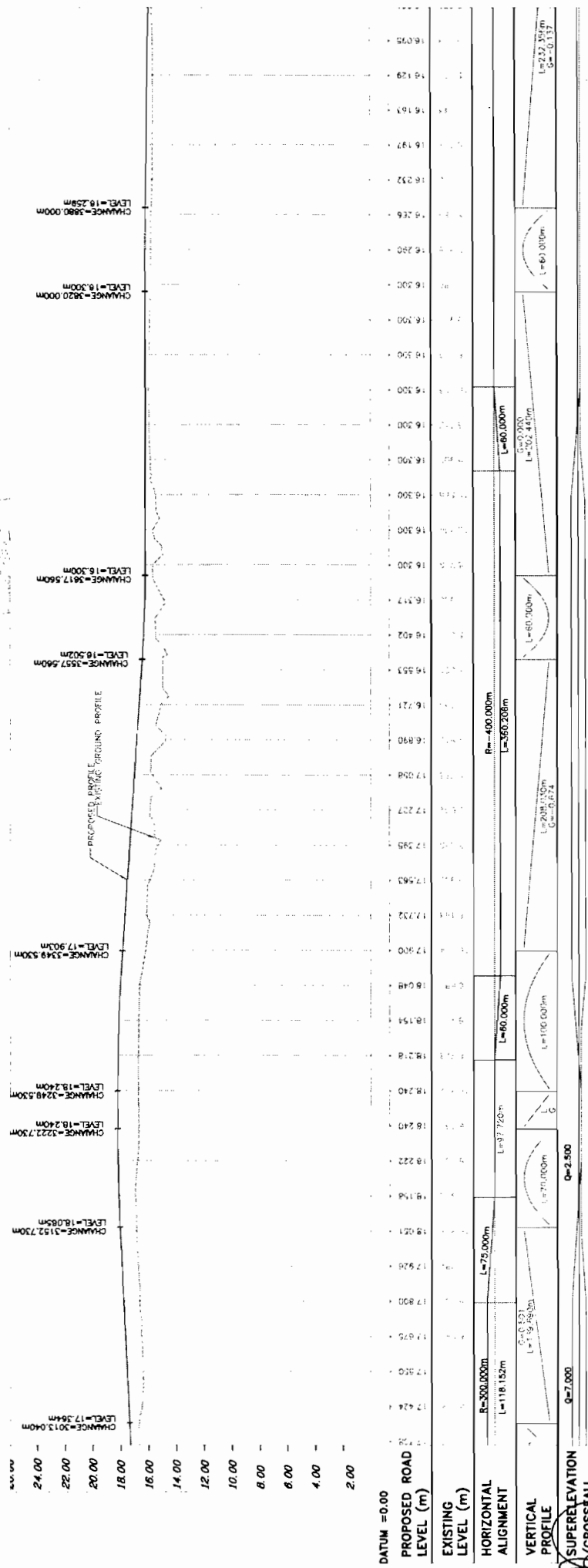
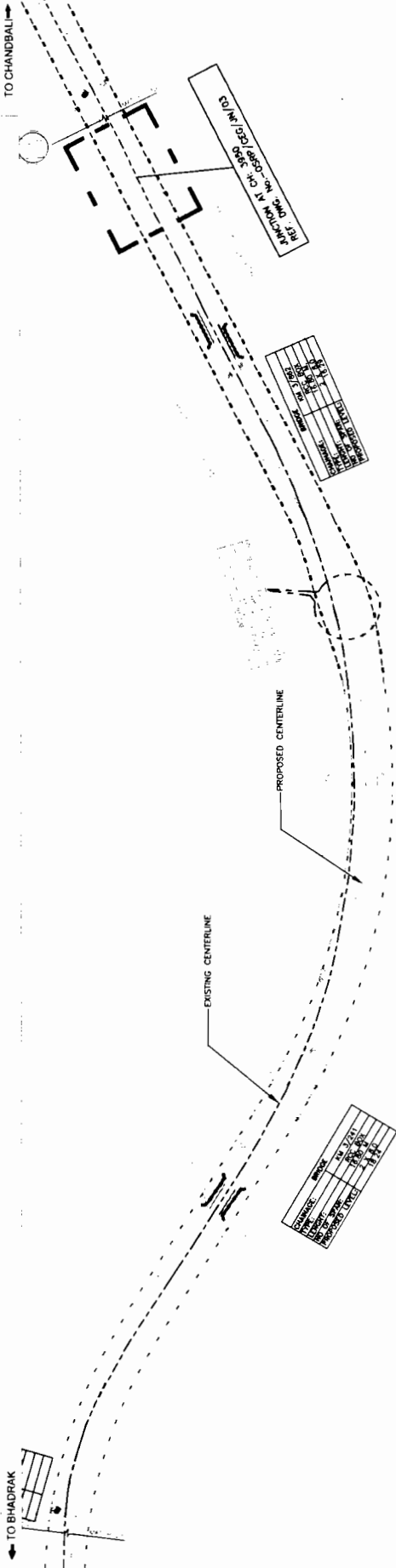
**LEGEND**

+	PROPOSED CENTERLINE
- - -	EXISTING CENTERLINE
—	PROPOSED ROAD PROFILE
- - -	EXISTING GROUND PROFILE
○	VERTICAL CURVE
□	CROSSFALL
△	CHANGING



Corsan Corviam Construccion S.A.  
 Contractor

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



WIDENING AND STRENGTHENING TO TWO LANE

ORISSA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE

PROJECT: ENGINEER, WBPROUP LTD.

LEGEND

CONSTRUCTION

PROPOSED ROAD LEVEL (m)

EXISTING LEVEL (m)

HORIZONTAL ALIGNMENT

VERTICAL PROFILE

SUPERELEVATION / CROSSFALL

CHAINAGE

CONSTRUCTION

PROPOSED ROAD LEVEL (m)

EXISTING LEVEL (m)

HORIZONTAL ALIGNMENT

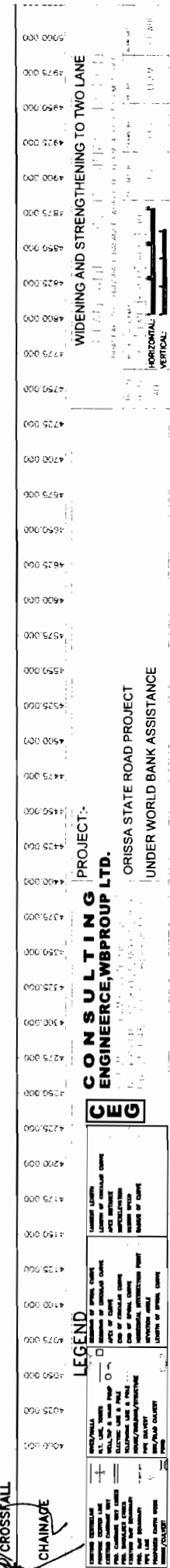
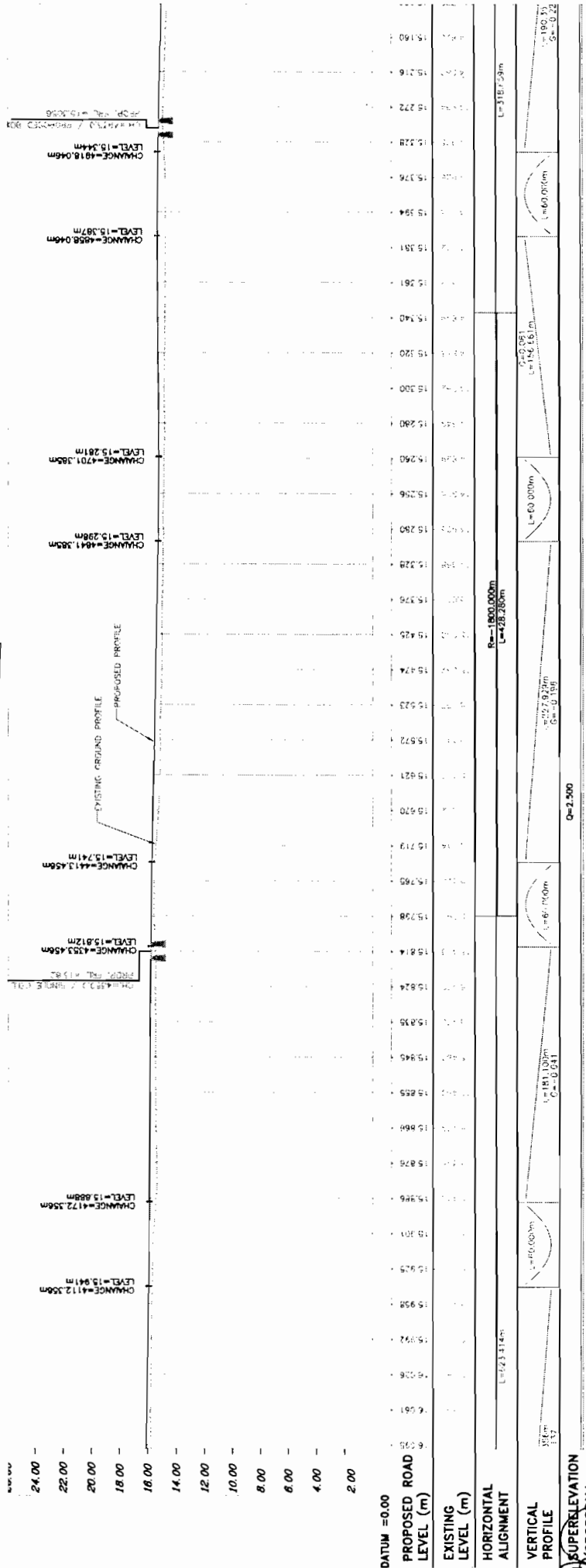
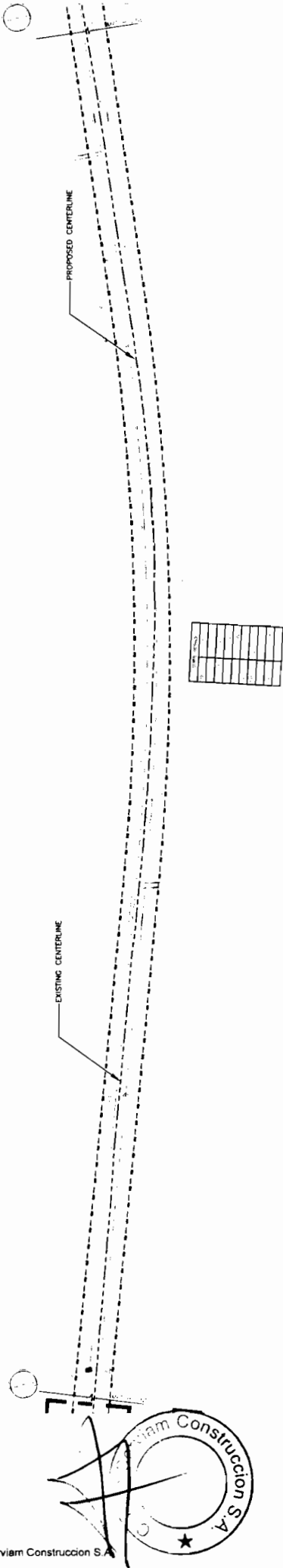
VERTICAL PROFILE

SUPERELEVATION / CROSSFALL

CHAINAGE

TO CHANBALI

TO BHADRAK



WIDENING AND STRENGTHENING TO TWO LANE

LEGEND

ORISSA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

PROJECT: ENGINEERING CONSULTANTS

ORISSA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

LEGEND

LEVEL OF SPILL CURB  
LEVEL OF SIDEWALK  
LEVEL OF ROAD  
LEVEL OF CHANNEL  
LEVEL OF DRAIN  
LEVEL OF GULLY  
LEVEL OF CULVERT

LEGEND

LEVEL OF SPILL CURB  
LEVEL OF SIDEWALK  
LEVEL OF ROAD  
LEVEL OF CHANNEL  
LEVEL OF DRAIN  
LEVEL OF GULLY  
LEVEL OF CULVERT

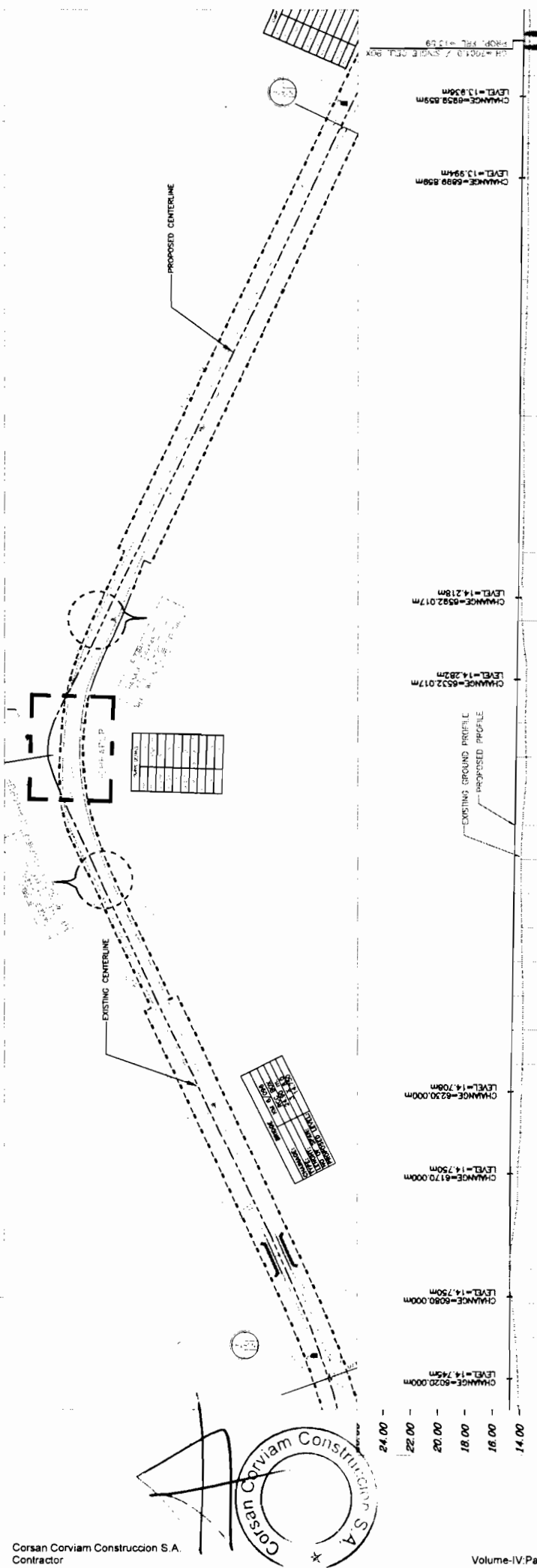
LEGEND

LEVEL OF SPILL CURB  
LEVEL OF SIDEWALK  
LEVEL OF ROAD  
LEVEL OF CHANNEL  
LEVEL OF DRAIN  
LEVEL OF GULLY  
LEVEL OF CULVERT

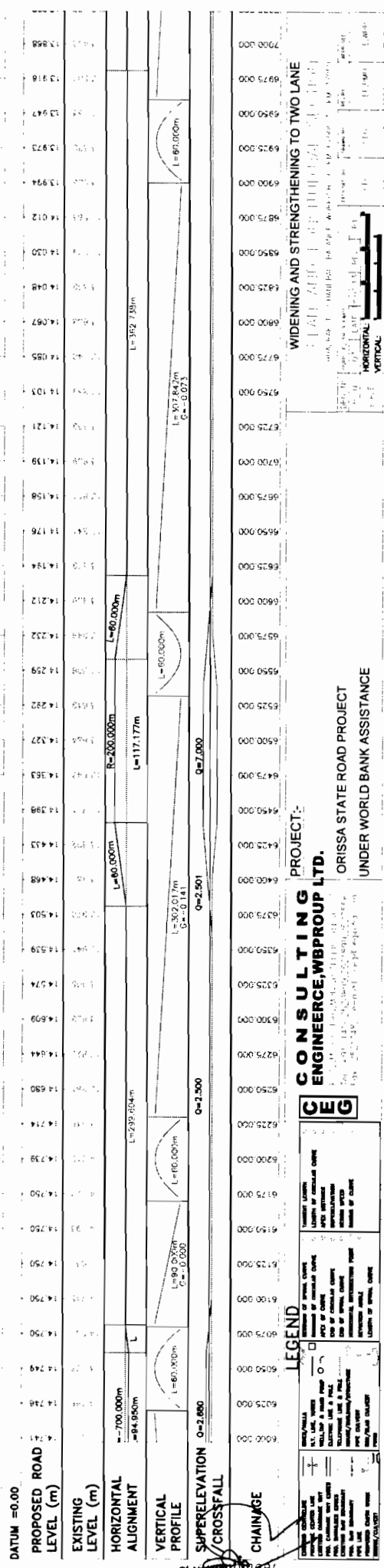


TO BHADRAK

TO CHANDBAL



Corvan Construction S.A.  
Contractor



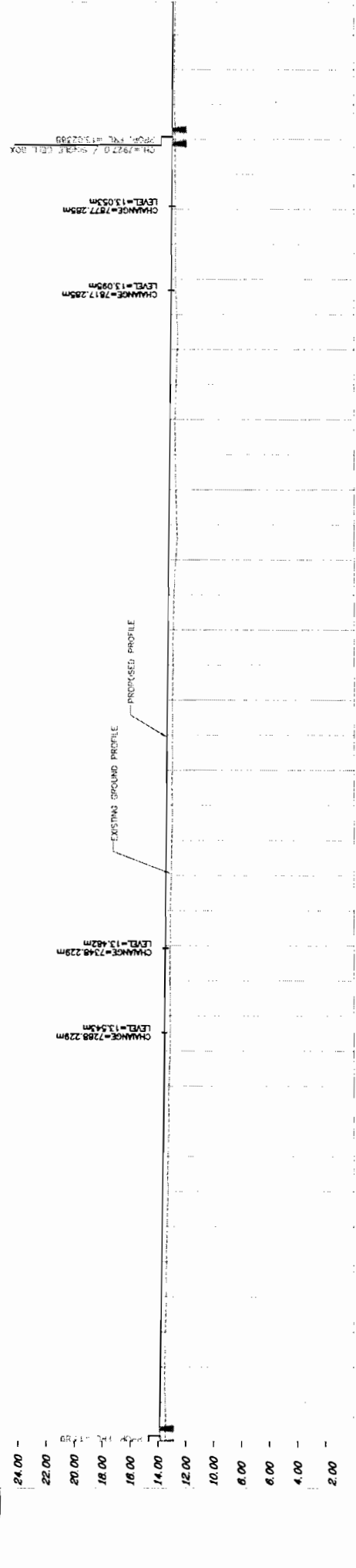
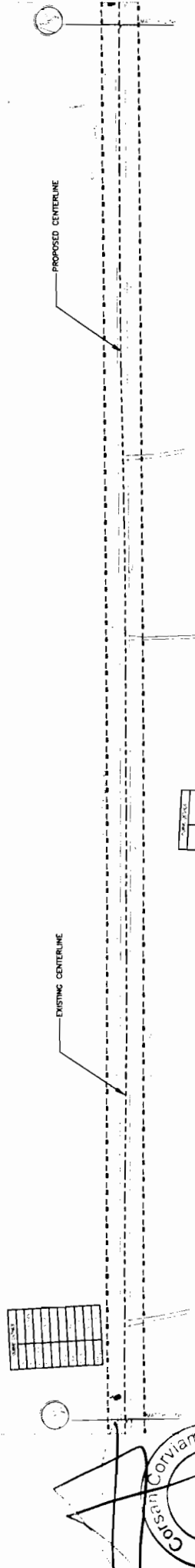
**CONSULTING PROJECT:**  
ENGINEERING, WBPROUP LTD.  
ORISSA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

**LEGEND**

Symbol	DESCRIPTION
Symbol	EXISTING CENTERLINE
Symbol	PROPOSED CENTERLINE
Symbol	EXISTING GROUND PROFILE
Symbol	PROPOSED PROFILE
Symbol	EXISTING ROAD
Symbol	PROPOSED ROAD
Symbol	EXISTING SIDEWALK
Symbol	PROPOSED SIDEWALK
Symbol	EXISTING DRAINAGE
Symbol	PROPOSED DRAINAGE
Symbol	EXISTING UTILITY
Symbol	PROPOSED UTILITY
Symbol	EXISTING FENCE
Symbol	PROPOSED FENCE
Symbol	EXISTING SIGN
Symbol	PROPOSED SIGN
Symbol	EXISTING LIGHTING
Symbol	PROPOSED LIGHTING
Symbol	EXISTING LANDSCAPE
Symbol	PROPOSED LANDSCAPE
Symbol	EXISTING VEGETATION
Symbol	PROPOSED VEGETATION
Symbol	EXISTING OBSTACLE
Symbol	PROPOSED OBSTACLE
Symbol	EXISTING STRUCTURE
Symbol	PROPOSED STRUCTURE
Symbol	EXISTING TOWER
Symbol	PROPOSED TOWER
Symbol	EXISTING PILE
Symbol	PROPOSED PILE
Symbol	EXISTING BRIDGE
Symbol	PROPOSED BRIDGE
Symbol	EXISTING TUNNEL
Symbol	PROPOSED TUNNEL
Symbol	EXISTING UNDERPASS
Symbol	PROPOSED UNDERPASS
Symbol	EXISTING OVERPASS
Symbol	PROPOSED OVERPASS
Symbol	EXISTING CULVERT
Symbol	PROPOSED CULVERT
Symbol	EXISTING DRAINAGE
Symbol	PROPOSED DRAINAGE
Symbol	EXISTING UTILITY
Symbol	PROPOSED UTILITY
Symbol	EXISTING FENCE
Symbol	PROPOSED FENCE
Symbol	EXISTING SIGN
Symbol	PROPOSED SIGN
Symbol	EXISTING LIGHTING
Symbol	PROPOSED LIGHTING
Symbol	EXISTING LANDSCAPE
Symbol	PROPOSED LANDSCAPE
Symbol	EXISTING VEGETATION
Symbol	PROPOSED VEGETATION
Symbol	EXISTING OBSTACLE
Symbol	PROPOSED OBSTACLE
Symbol	EXISTING STRUCTURE
Symbol	PROPOSED STRUCTURE
Symbol	EXISTING TOWER
Symbol	PROPOSED TOWER
Symbol	EXISTING PILE
Symbol	PROPOSED PILE
Symbol	EXISTING BRIDGE
Symbol	PROPOSED BRIDGE
Symbol	EXISTING TUNNEL
Symbol	PROPOSED TUNNEL
Symbol	EXISTING UNDERPASS
Symbol	PROPOSED UNDERPASS
Symbol	EXISTING OVERPASS
Symbol	PROPOSED OVERPASS
Symbol	EXISTING CULVERT
Symbol	PROPOSED CULVERT

TO BHADRAK

TO CHANDBALI



DATUM = 0.00	PROPOSED ROAD LEVEL (m)	EXISTING LEVEL (m)	HORIZONTAL ALIGNMENT	VERTICAL PROFILE	SUPERELEVATION	CROSSFALL	CHAINAGE
	24.00	23.98	R=10000.000m L=164.000m	R=25000.000m L=181.266m	L=228.370m G=-0.120	L=60.000m G=-2.500	7000.000
	22.00	21.98					7025.000
	20.00	19.98					7050.000
	18.00	17.98					7075.000
	16.00	15.98					7100.000
	14.00	13.98					7125.000
	12.00	11.98					7150.000
	10.00	9.98					7175.000
	8.00	7.98					7200.000
	6.00	5.98					7225.000
	4.00	3.98					7250.000
	2.00	1.98					7275.000
							7300.000
							7325.000
							7350.000
							7375.000
							7400.000
							7425.000
							7450.000
							7475.000
							7500.000
							7525.000
							7550.000
							7575.000
							7600.000
							7625.000
							7650.000
							7675.000
							7700.000
							7725.000
							7750.000
							7775.000
							7800.000
							7825.000
							7850.000
							7875.000
							7900.000
							7925.000
							7950.000
							7975.000
							8000.000

**LEGEND**

PROPOSED ROAD	PROPOSED ROAD	PROPOSED ROAD	PROPOSED ROAD
EXISTING ROAD	EXISTING ROAD	EXISTING ROAD	EXISTING ROAD
PROPOSED CENTERLINE	PROPOSED CENTERLINE	PROPOSED CENTERLINE	PROPOSED CENTERLINE
EXISTING CENTERLINE	EXISTING CENTERLINE	EXISTING CENTERLINE	EXISTING CENTERLINE
PROPOSED CROSSFALL	PROPOSED CROSSFALL	PROPOSED CROSSFALL	PROPOSED CROSSFALL
EXISTING CROSSFALL	EXISTING CROSSFALL	EXISTING CROSSFALL	EXISTING CROSSFALL
PROPOSED SUPERELEVATION	PROPOSED SUPERELEVATION	PROPOSED SUPERELEVATION	PROPOSED SUPERELEVATION
EXISTING SUPERELEVATION	EXISTING SUPERELEVATION	EXISTING SUPERELEVATION	EXISTING SUPERELEVATION
PROPOSED HORIZONTAL ALIGNMENT	PROPOSED HORIZONTAL ALIGNMENT	PROPOSED HORIZONTAL ALIGNMENT	PROPOSED HORIZONTAL ALIGNMENT
EXISTING HORIZONTAL ALIGNMENT	EXISTING HORIZONTAL ALIGNMENT	EXISTING HORIZONTAL ALIGNMENT	EXISTING HORIZONTAL ALIGNMENT
PROPOSED VERTICAL PROFILE	PROPOSED VERTICAL PROFILE	PROPOSED VERTICAL PROFILE	PROPOSED VERTICAL PROFILE
EXISTING VERTICAL PROFILE	EXISTING VERTICAL PROFILE	EXISTING VERTICAL PROFILE	EXISTING VERTICAL PROFILE

**CONSULTING PROJECT:**  
**ENGINEERING, WBPROUD LTD.**  
 ORISSA STATE ROAD PROJECT  
 UNDER WORLD BANK ASSISTANCE



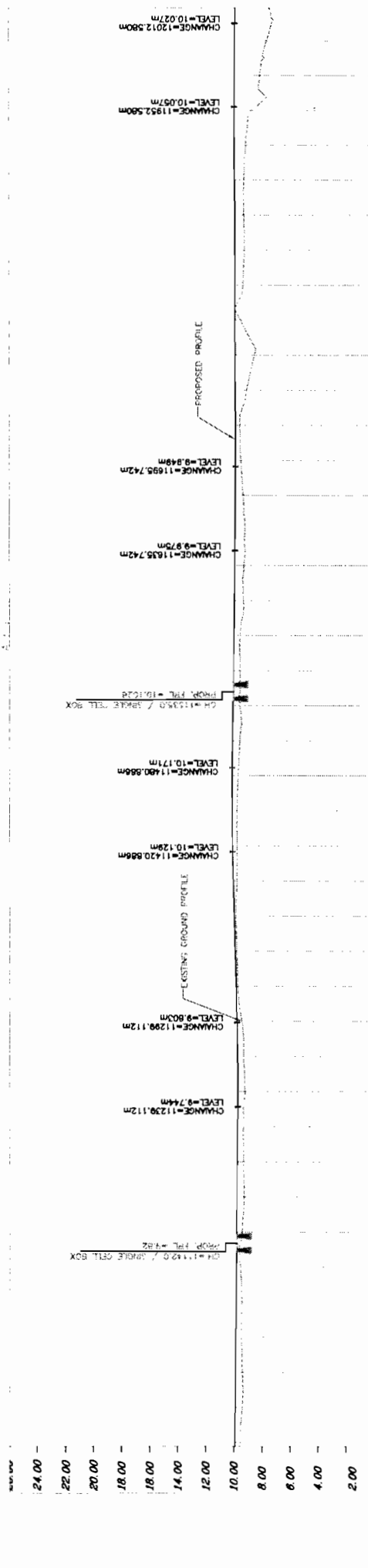
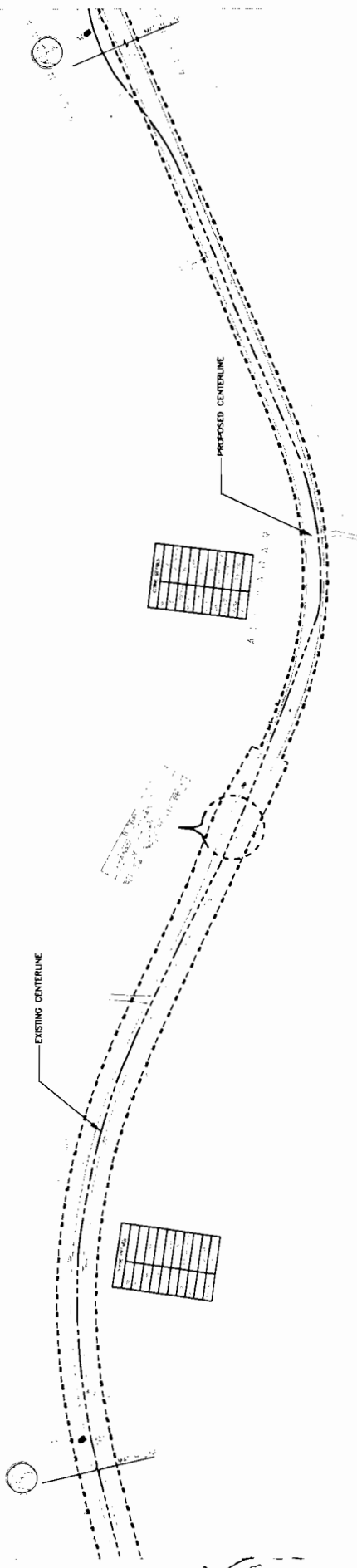






TO CHANDBAL

TO BHADRAK



Station	Existing Level (m)	Proposed Level (m)	Vertical Curve Data
1000+00	10.00	10.00	
1000+10	10.00	10.00	
1000+20	10.00	10.00	
1000+30	10.00	10.00	
1000+40	10.00	10.00	
1000+42	10.00	10.00	

**LEGEND**

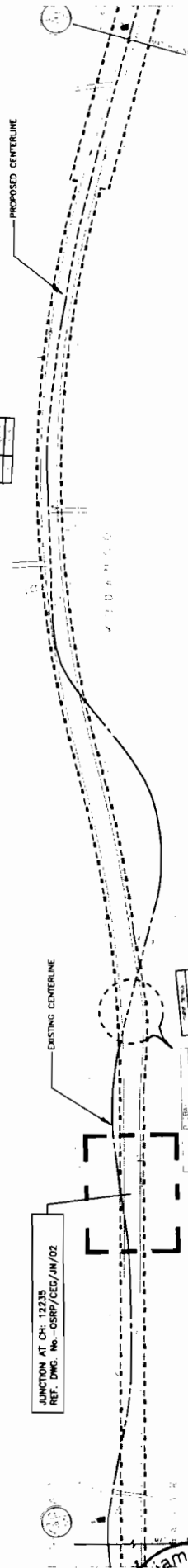
**PROJECT:-**  
**WIDENING AND STRENGTHENING TO TWO LANE**  
**ORISSA STATE ROAD PROJECT**  
**UNDER WORLD BANK ASSISTANCE**

**CONSULTING ENGINEER, WBPROU LTD.**  
 401/111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

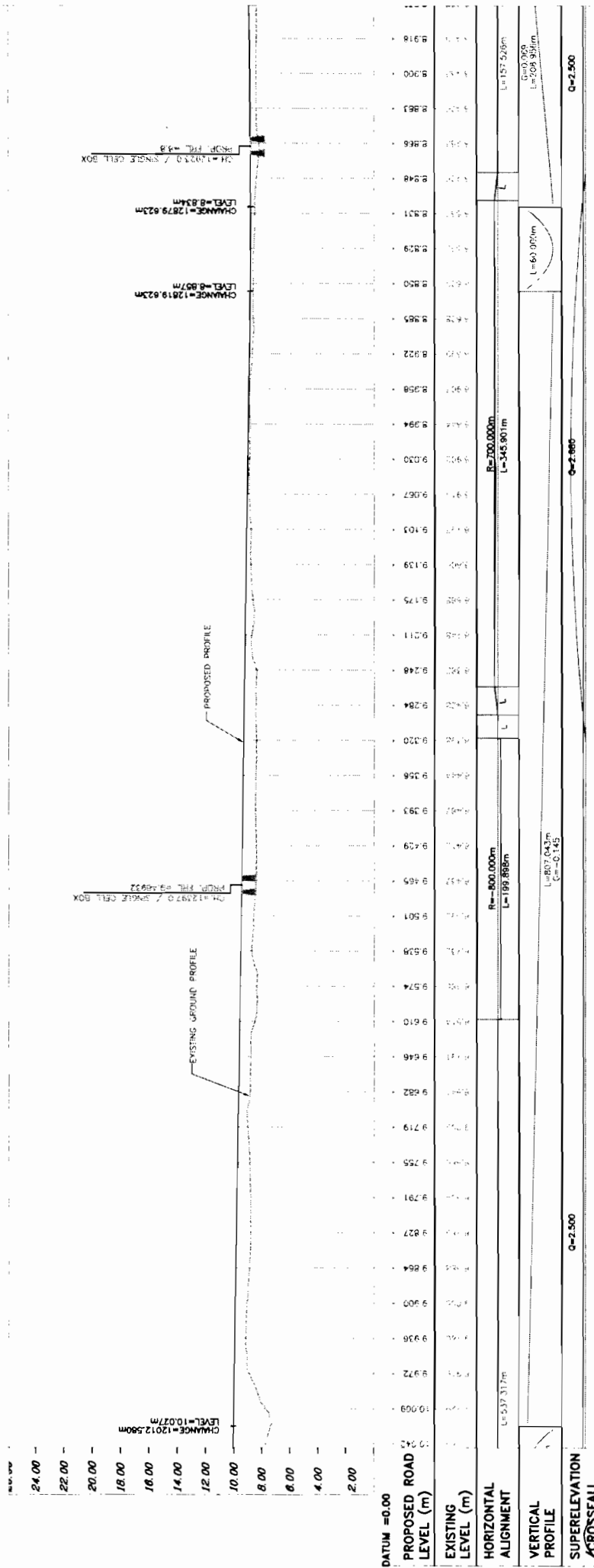
TO BHADRAK

TO CHANBALI

1	2	3	4	5	6	7	8	9	10



JUNCTION AT CH. 12235  
REF. DWG. No. -OSRP/CEG/JN/02



CHAINAGE	PROPOSED ROAD LEVEL (m)	EXISTING LEVEL (m)	HORIZONTAL ALIGNMENT	VERTICAL PROFILE	SUPERELEVATION	CROSSFALL
1000.000	10.00	10.00	L=537.317m	G=0.000	0=2.500	
1050.000	12.00	12.00				
1100.000	14.00	14.00				
1150.000	16.00	16.00				
1200.000	18.00	18.00				
1250.000	20.00	20.00				
1300.000	22.00	22.00				
1350.000	24.00	24.00				

**LEGEND**

Symbol	Description
+	Center of Mass
○	Center of Gravity
□	Center of Buoyancy
△	Center of Rotation
◇	Center of Oscillation
◇	Center of Percussion
◇	Center of Instantaneous Rotation
◇	Center of Instantaneous Oscillation
◇	Center of Instantaneous Percussion
◇	Center of Instantaneous Rotation/Oscillation/Percussion

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

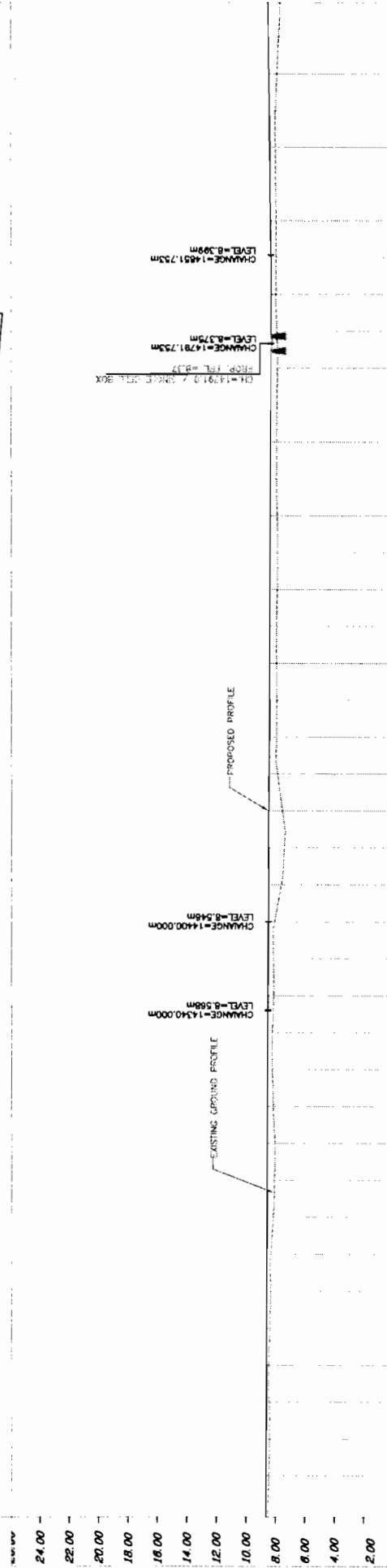
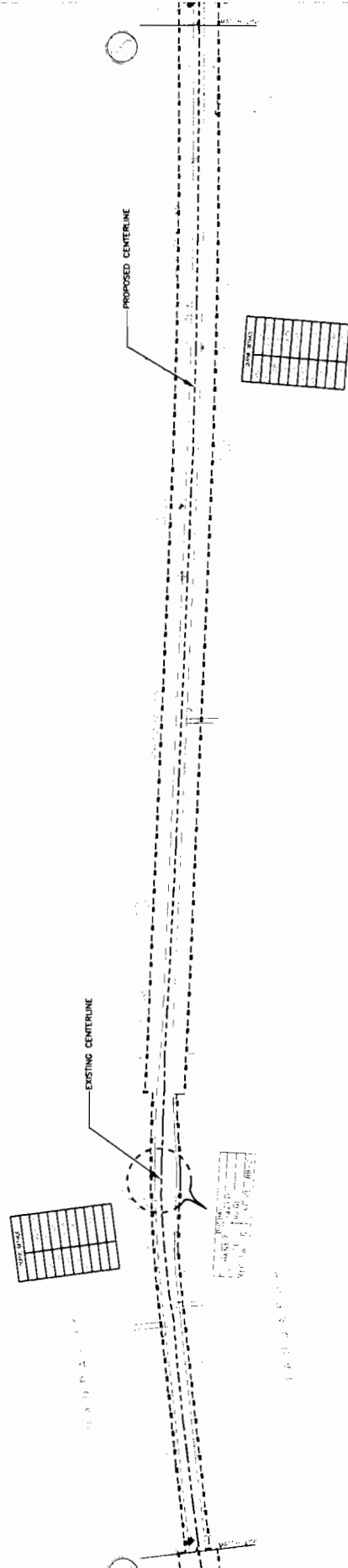
**WIDENING AND STRENGTHENING TO TWO LANE**

Scale: 1:1000 (Horizontal) / 1:100 (Vertical)



TO BHADRAK

TO CHANDBALI



STATIONING	PROPOSED ROAD LEVEL (m)	EXISTING LEVEL (m)
8.570	8.570	8.570
8.571	8.571	8.571
8.572	8.572	8.572
8.573	8.573	8.573
8.574	8.574	8.574
8.575	8.575	8.575
8.576	8.576	8.576
8.577	8.577	8.577
8.578	8.578	8.578
8.579	8.579	8.579
8.580	8.580	8.580
8.581	8.581	8.581
8.582	8.582	8.582
8.583	8.583	8.583
8.584	8.584	8.584
8.585	8.585	8.585
8.586	8.586	8.586
8.587	8.587	8.587
8.588	8.588	8.588
8.589	8.589	8.589
8.590	8.590	8.590
8.591	8.591	8.591
8.592	8.592	8.592
8.593	8.593	8.593
8.594	8.594	8.594
8.595	8.595	8.595
8.596	8.596	8.596
8.597	8.597	8.597
8.598	8.598	8.598
8.599	8.599	8.599
8.600	8.600	8.600
8.601	8.601	8.601
8.602	8.602	8.602
8.603	8.603	8.603
8.604	8.604	8.604
8.605	8.605	8.605
8.606	8.606	8.606
8.607	8.607	8.607
8.608	8.608	8.608
8.609	8.609	8.609
8.610	8.610	8.610
8.611	8.611	8.611
8.612	8.612	8.612
8.613	8.613	8.613
8.614	8.614	8.614
8.615	8.615	8.615
8.616	8.616	8.616
8.617	8.617	8.617
8.618	8.618	8.618
8.619	8.619	8.619
8.620	8.620	8.620
8.621	8.621	8.621
8.622	8.622	8.622
8.623	8.623	8.623
8.624	8.624	8.624
8.625	8.625	8.625
8.626	8.626	8.626
8.627	8.627	8.627
8.628	8.628	8.628
8.629	8.629	8.629
8.630	8.630	8.630
8.631	8.631	8.631
8.632	8.632	8.632
8.633	8.633	8.633
8.634	8.634	8.634
8.635	8.635	8.635
8.636	8.636	8.636
8.637	8.637	8.637
8.638	8.638	8.638
8.639	8.639	8.639
8.640	8.640	8.640
8.641	8.641	8.641
8.642	8.642	8.642
8.643	8.643	8.643
8.644	8.644	8.644
8.645	8.645	8.645
8.646	8.646	8.646
8.647	8.647	8.647
8.648	8.648	8.648
8.649	8.649	8.649
8.650	8.650	8.650
8.651	8.651	8.651
8.652	8.652	8.652
8.653	8.653	8.653
8.654	8.654	8.654
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8.658	8.658	8.658
8.659	8.659	8.659
8.660	8.660	8.660
8.661	8.661	8.661
8.662	8.662	8.662
8.663	8.663	8.663
8.664	8.664	8.664
8.665	8.665	8.665
8.666	8.666	8.666
8.667	8.667	8.667
8.668	8.668	8.668
8.669	8.669	8.669
8.670	8.670	8.670

**LEGEND**

- PROPOSED CENTERLINE
- EXISTING CENTERLINE
- EXISTING GROUND PROFILE
- PROPOSED PROFILE
- CHANGES
- LEVEL
- CHANGES
- LEVEL
- CHANGES
- LEVEL
- CHANGES
- LEVEL

**PROJECT:**  
**CONSULTING ENGINEER: WBP GROUP LTD.**  
 ORISSA STATE ROAD PROJECT  
 UNDER WORLD BANK ASSISTANCE

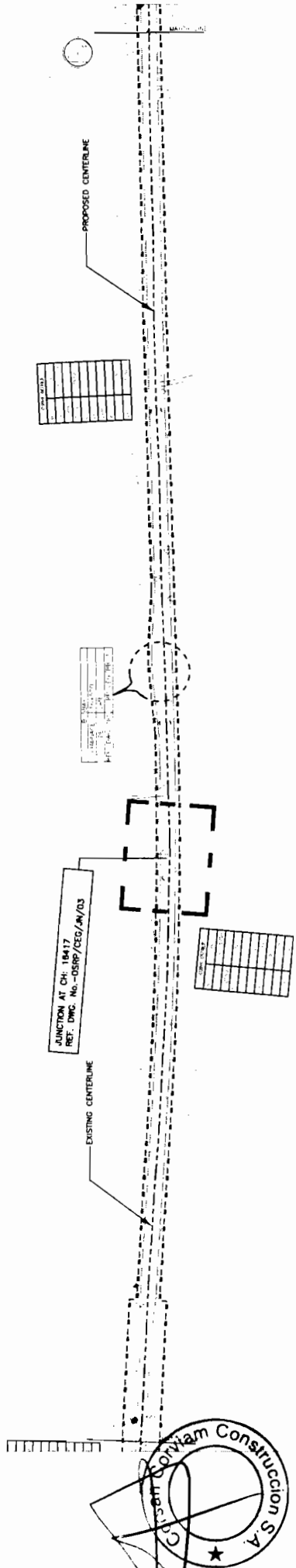
**VERTICAL**

**HORIZONTAL**



← TO BHADRAK

TO CHANDBALI →



PROPOSED ROAD LEVEL (m)	EXISTING LEVEL (m)	ALIGNMENT	SUPERELEVATION /CROSSFALL	CHAINAGE
8.00	8.00			17000.000
8.00	8.00			17005.000
8.00	8.00			17010.000
8.00	8.00			17015.000
8.00	8.00			17020.000
8.00	8.00			17025.000
8.00	8.00			17030.000
8.00	8.00			17035.000
8.00	8.00			17040.000
8.00	8.00			17045.000
8.00	8.00			17050.000
8.00	8.00			17055.000
8.00	8.00			17060.000
8.00	8.00			17065.000
8.00	8.00			17070.000
8.00	8.00			17075.000
8.00	8.00			17080.000
8.00	8.00			17085.000
8.00	8.00			17090.000
8.00	8.00			17095.000
8.00	8.00			17100.000
8.00	8.00			17105.000
8.00	8.00			17110.000
8.00	8.00			17115.000
8.00	8.00			17120.000
8.00	8.00			17125.000
8.00	8.00			17130.000
8.00	8.00			17135.000
8.00	8.00			17140.000
8.00	8.00			17145.000
8.00	8.00			17150.000
8.00	8.00			17155.000
8.00	8.00			17160.000
8.00	8.00			17165.000
8.00	8.00			17170.000
8.00	8.00			17175.000
8.00	8.00			17180.000
8.00	8.00			17185.000
8.00	8.00			17190.000
8.00	8.00			17195.000
8.00	8.00			17200.000
8.00	8.00			17205.000
8.00	8.00			17210.000
8.00	8.00			17215.000
8.00	8.00			17220.000
8.00	8.00			17225.000
8.00	8.00			17230.000
8.00	8.00			17235.000
8.00	8.00			17240.000
8.00	8.00			17245.000
8.00	8.00			17250.000
8.00	8.00			17255.000
8.00	8.00			17260.000
8.00	8.00			17265.000
8.00	8.00			17270.000
8.00	8.00			17275.000
8.00	8.00			17280.000
8.00	8.00			17285.000
8.00	8.00			17290.000
8.00	8.00			17295.000
8.00	8.00			17300.000
8.00	8.00			17305.000
8.00	8.00			17310.000
8.00	8.00			17315.000
8.00	8.00			17320.000
8.00	8.00			17325.000
8.00	8.00			17330.000
8.00	8.00			17335.000
8.00	8.00			17340.000
8.00	8.00			17345.000
8.00	8.00			17350.000
8.00	8.00			17355.000
8.00	8.00			17360.000
8.00	8.00			17365.000
8.00	8.00			17370.000
8.00	8.00			17375.000
8.00	8.00			17380.000
8.00	8.00			17385.000
8.00	8.00			17390.000
8.00	8.00			17395.000
8.00	8.00			17400.000
8.00	8.00			17405.000
8.00	8.00			17410.000
8.00	8.00			17415.000
8.00	8.00			17420.000
8.00	8.00			17425.000
8.00	8.00			17430.000
8.00	8.00			17435.000
8.00	8.00			17440.000
8.00	8.00			17445.000
8.00	8.00			17450.000
8.00	8.00			17455.000
8.00	8.00			17460.000
8.00	8.00			17465.000
8.00	8.00			17470.000
8.00	8.00			17475.000
8.00	8.00			17480.000
8.00	8.00			17485.000
8.00	8.00			17490.000
8.00	8.00			17495.000
8.00	8.00			17500.000
8.00	8.00			17505.000
8.00	8.00			17510.000
8.00	8.00			17515.000
8.00	8.00			17520.000
8.00	8.00			17525.000
8.00	8.00			17530.000
8.00	8.00			17535.000
8.00	8.00			17540.000
8.00	8.00			17545.000
8.00	8.00			17550.000
8.00	8.00			17555.000
8.00	8.00			17560.000
8.00	8.00			17565.000
8.00	8.00			17570.000
8.00	8.00			17575.000
8.00	8.00			17580.000
8.00	8.00			17585.000
8.00	8.00			17590.000
8.00	8.00			17595.000
8.00	8.00			17600.000

**LEGEND**

**CEG**

**WIDENING AND STRENGTHENING TO TWO LANE**

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

**CONSULTING PROJECT:**  
**ENGINEER, WBPROUP LTD.**

**CONSTRUCTION S.A.**

**World Bank Projects Orissa**  
**World Bank Project**  
**O/o the E.I.C.(Civil), Orissa**  
**Bhubaneswar.**



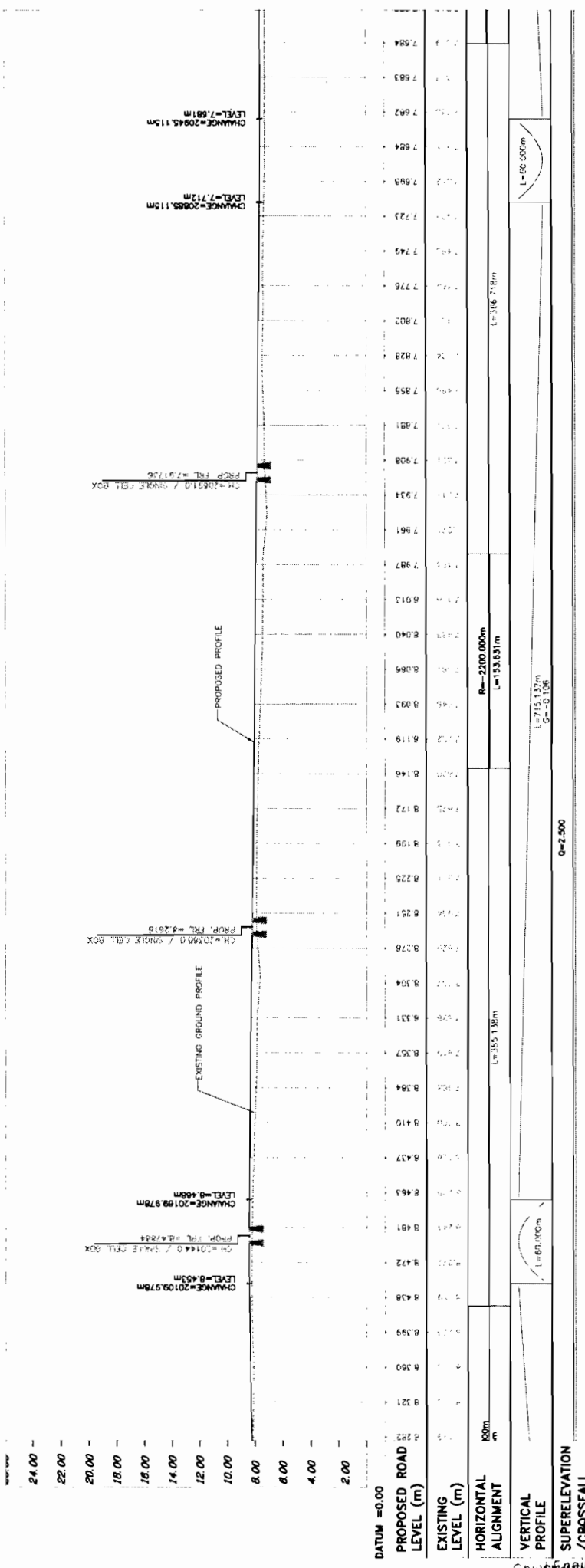
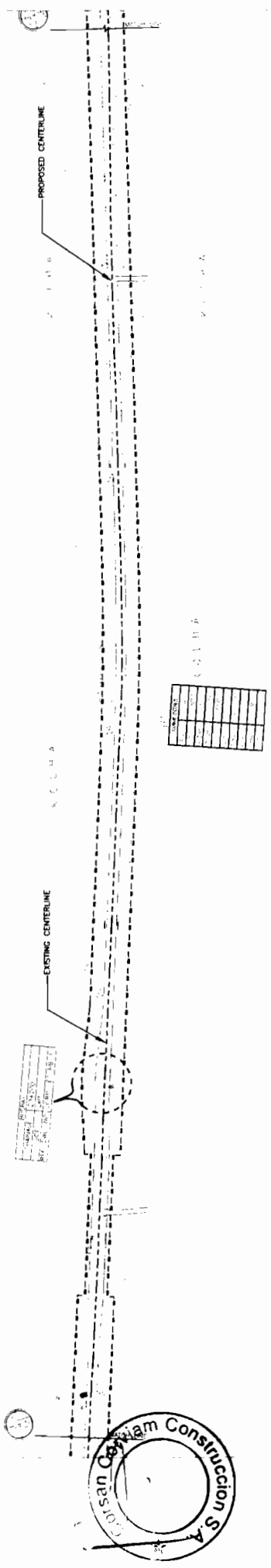






TO BHADRAK

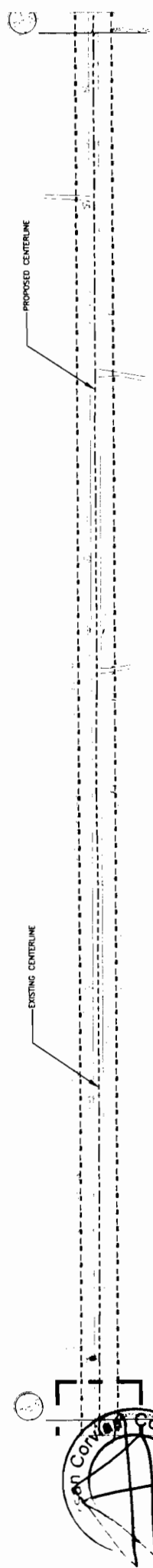
TO CHANBALI



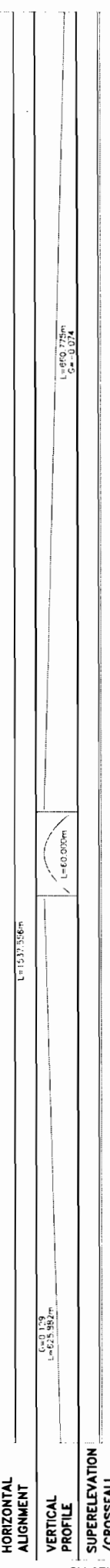


← TO BHADRAK

TO CHANBALI →



CHAINAGE	PROPOSED ROAD LEVEL (m)	EXISTING ROAD LEVEL (m)	EXISTING GROUND PROFILE	PROPOSED PROFILE
24.00	24.00	24.00		
22.00	22.00	22.00		
20.00	20.00	20.00		
18.00	18.00	18.00		
16.00	16.00	16.00		
14.00	14.00	14.00		
12.00	12.00	12.00		
10.00	10.00	10.00		
8.00	8.00	8.00		
6.00	6.00	6.00		
4.00	4.00	4.00		
2.00	2.00	2.00		
DATUM = 0.00				
2.00	8.254	8.254		
4.00	8.273	8.273		
6.00	8.291	8.291		
8.00	8.310	8.310		
10.00	8.329	8.329		
12.00	8.347	8.347		
14.00	8.365	8.365		
16.00	8.385	8.385		
18.00	8.403	8.403		
20.00	8.422	8.422		
22.00	8.440	8.440		
24.00	8.459	8.459		
26.00	8.478	8.478		
28.00	8.496	8.496		
30.00	8.515	8.515		
32.00	8.533	8.533		
34.00	8.552	8.552		
36.00	8.571	8.571		
38.00	8.589	8.589		
40.00	8.608	8.608		
42.00	8.627	8.627		
44.00	8.645	8.645		
46.00	8.664	8.664		
48.00	8.672	8.672		
50.00	8.680	8.680		
52.00	8.690	8.690		
54.00	8.700	8.700		
56.00	8.710	8.710		
58.00	8.720	8.720		
60.00	8.730	8.730		
62.00	8.740	8.740		
64.00	8.750	8.750		
66.00	8.760	8.760		
68.00	8.770	8.770		
70.00	8.780	8.780		
72.00	8.790	8.790		
74.00	8.800	8.800		
76.00	8.810	8.810		
78.00	8.820	8.820		
80.00	8.830	8.830		
82.00	8.840	8.840		
84.00	8.850	8.850		
86.00	8.860	8.860		
88.00	8.870	8.870		
90.00	8.880	8.880		
92.00	8.890	8.890		
94.00	8.900	8.900		
96.00	8.910	8.910		
98.00	8.920	8.920		
100.00	8.930	8.930		



CHAINAGE	PROPOSED ROAD LEVEL (m)	EXISTING ROAD LEVEL (m)	EXISTING GROUND PROFILE	PROPOSED PROFILE
23000.000	23.000	23.000		
23250.000	23.250	23.250		
23500.000	23.500	23.500		
23750.000	23.750	23.750		
24000.000	24.000	24.000		
24250.000	24.250	24.250		
24500.000	24.500	24.500		
24750.000	24.750	24.750		
25000.000	25.000	25.000		
25250.000	25.250	25.250		
25500.000	25.500	25.500		
25750.000	25.750	25.750		
26000.000	26.000	26.000		
26250.000	26.250	26.250		
26500.000	26.500	26.500		
26750.000	26.750	26.750		
27000.000	27.000	27.000		
27250.000	27.250	27.250		
27500.000	27.500	27.500		
27750.000	27.750	27.750		
28000.000	28.000	28.000		
28250.000	28.250	28.250		
28500.000	28.500	28.500		
28750.000	28.750	28.750		
29000.000	29.000	29.000		
29250.000	29.250	29.250		
29500.000	29.500	29.500		
29750.000	29.750	29.750		
30000.000	30.000	30.000		

**LEGEND**

Proposed Road Level  
 Existing Road Level  
 Existing Ground Profile  
 Proposed Profile  
 Chainage  
 Datum  
 Vertical Curve  
 Super-elevation/Crossfall

**PROJECT:-**  
**CONSULTING ENGINEER, WBPROUP LTD.**  
 ORISSA STATE ROAD PROJECT  
 UNDER WORLD BANK ASSISTANCE

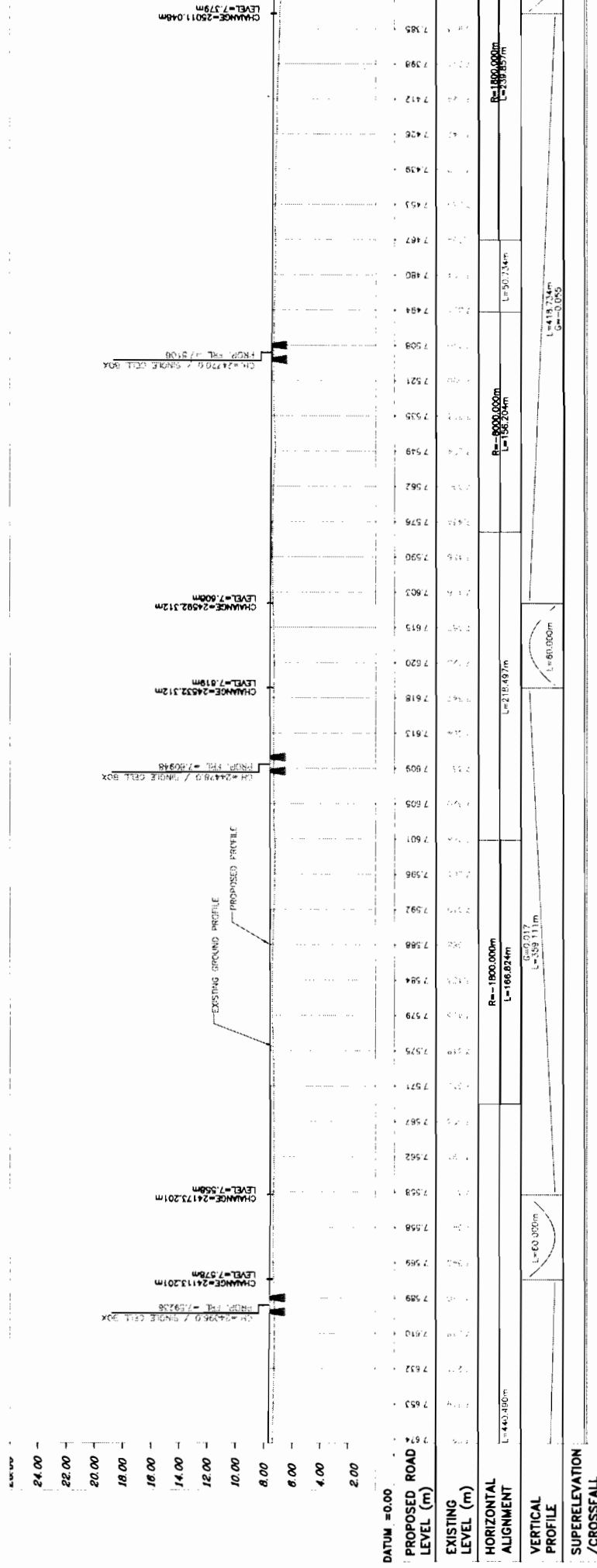
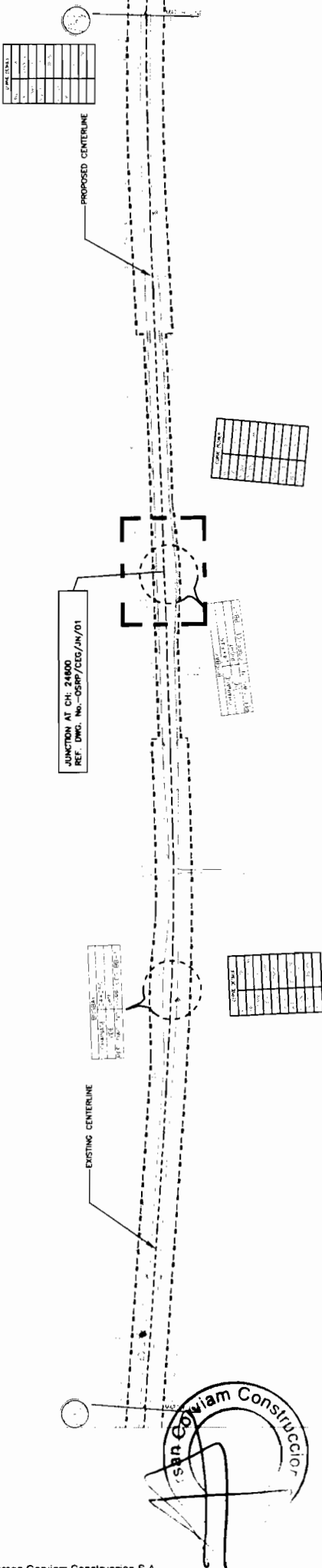
**WIDENING AND STRENGTHENING TO TWO LANE**

L=60.00m  
 G=0.15%  
 C=0.074



TO BHADRAK

TO CHANDBALI



**CEG CONSULTING ENGINEERS/WBPROUP LTD.**  
PROJECT: WIDENING AND STRENGTHENING TO TWO LANE  
ORISSA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

**LEGEND**

PROPOSED ROAD LEVEL (m)

EXISTING LEVEL (m)

HORIZONTAL ALIGNMENT

VERTICAL PROFILE

SUPERELEVATION / CROSSFALL

CHAINAGE

EXISTING GROUND PROFILE

PROPOSED PROFILE

CH=24796.0 / SINGLE CELL BOX  
PROP. PHL. = 7.59258

CH=24778.0 / SINGLE CELL BOX  
PROP. PHL. = 7.60948

CH=24720.0 / SINGLE CELL BOX  
PROP. PHL. = 8.1008

LEVEL=7.578m

CHANGE=24113.201m

LEVEL=7.558m

LEVEL=7.592m

CHANGE=24532.312m

LEVEL=7.619m

CHANGE=24592.312m

LEVEL=7.609m

LEVEL=7.592m

CHANGE=25011.048m

LEVEL=7.579m

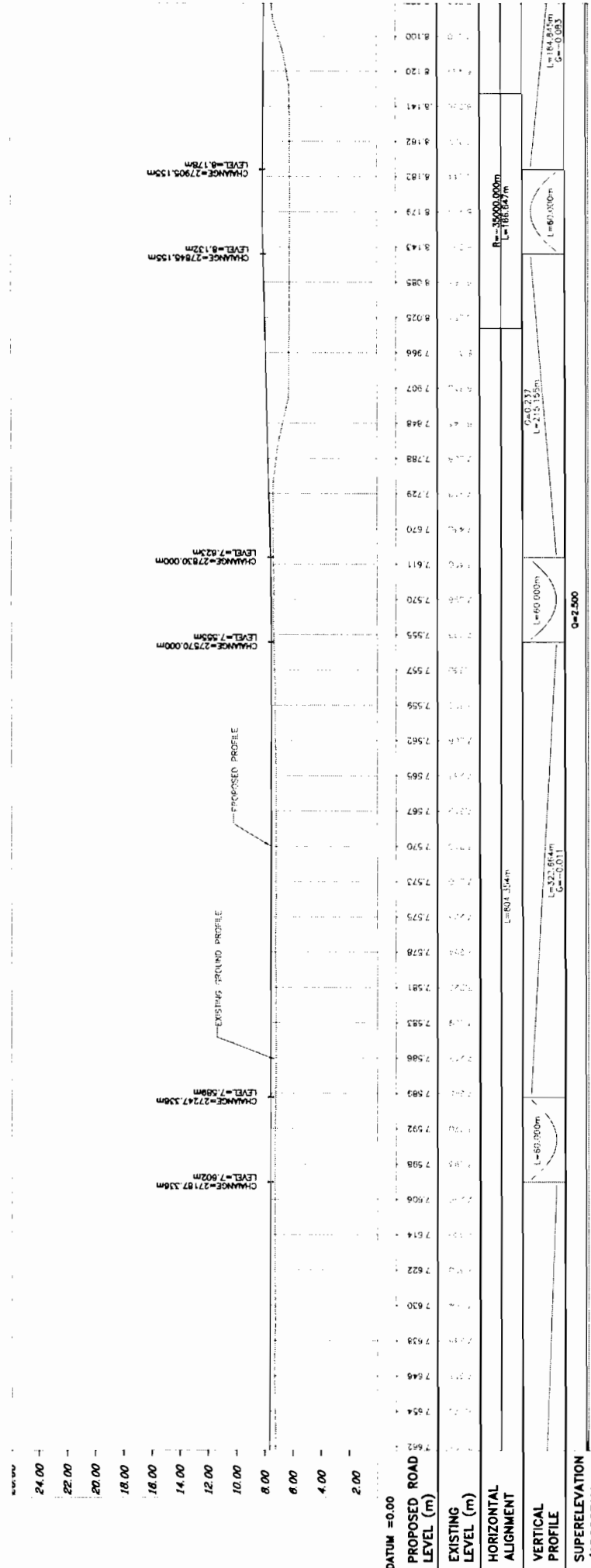
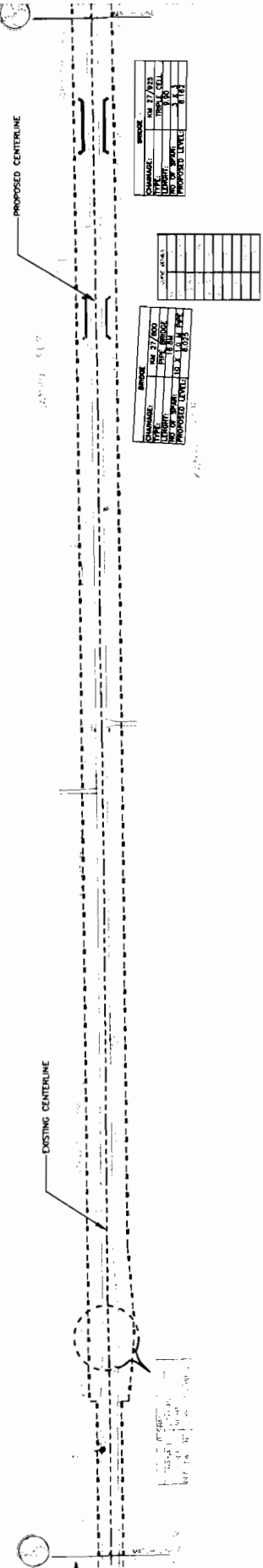




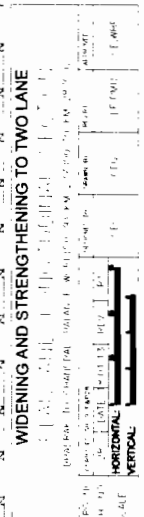


TO BHADRAK

TO CHANBALI



STATIONING	PROPOSED ROAD LEVEL (m)	EXISTING LEVEL (m)	CHAINAGE
7552.000	2.00	7.508	
7554.000	2.00	7.508	
7556.000	2.00	7.508	
7558.000	2.00	7.508	
7560.000	2.00	7.508	
7562.000	2.00	7.508	
7564.000	2.00	7.508	
7566.000	2.00	7.508	
7568.000	2.00	7.508	
7570.000	2.00	7.508	
7572.000	2.00	7.508	
7574.000	2.00	7.508	
7576.000	2.00	7.508	
7578.000	2.00	7.508	
7580.000	2.00	7.508	
7582.000	2.00	7.508	
7584.000	2.00	7.508	
7586.000	2.00	7.508	
7588.000	2.00	7.508	
7590.000	2.00	7.508	
7592.000	2.00	7.508	
7594.000	2.00	7.508	
7596.000	2.00	7.508	
7598.000	2.00	7.508	
7600.000	2.00	7.508	
7602.000	2.00	7.508	
7604.000	2.00	7.508	
7606.000	2.00	7.508	
7608.000	2.00	7.508	
7610.000	2.00	7.508	
7612.000	2.00	7.508	
7614.000	2.00	7.508	
7616.000	2.00	7.508	
7618.000	2.00	7.508	
7620.000	2.00	7.508	
7622.000	2.00	7.508	
7624.000	2.00	7.508	
7626.000	2.00	7.508	
7628.000	2.00	7.508	
7630.000	2.00	7.508	
7632.000	2.00	7.508	
7634.000	2.00	7.508	
7636.000	2.00	7.508	
7638.000	2.00	7.508	
7640.000	2.00	7.508	
7642.000	2.00	7.508	
7644.000	2.00	7.508	
7646.000	2.00	7.508	
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7994.000	2.00	7.508	
7996.000	2.00	7.508	
7998.000	2.00	7.508	
8000.000	2.00	7.508	



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

**ENGINEERING CONSULTANTS**  
**CONSULTING ENGINEERS, WBPROUP LTD.**  
 10/1, BANGALORE ROAD, CUTTACK  
 TEL: 2532111, 2532112, 2532113, 2532114  
 FAX: 2532115, 2532116, 2532117, 2532118  
 E-MAIL: WBPROUP@VSNL.COM

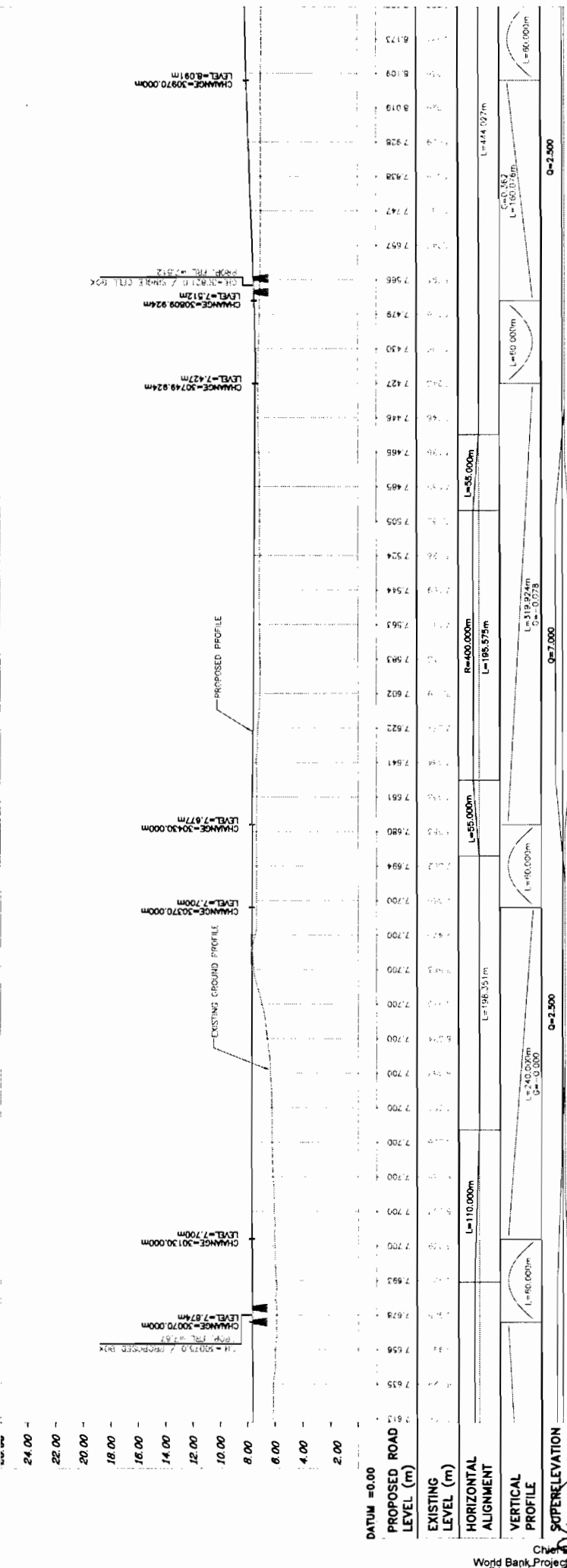
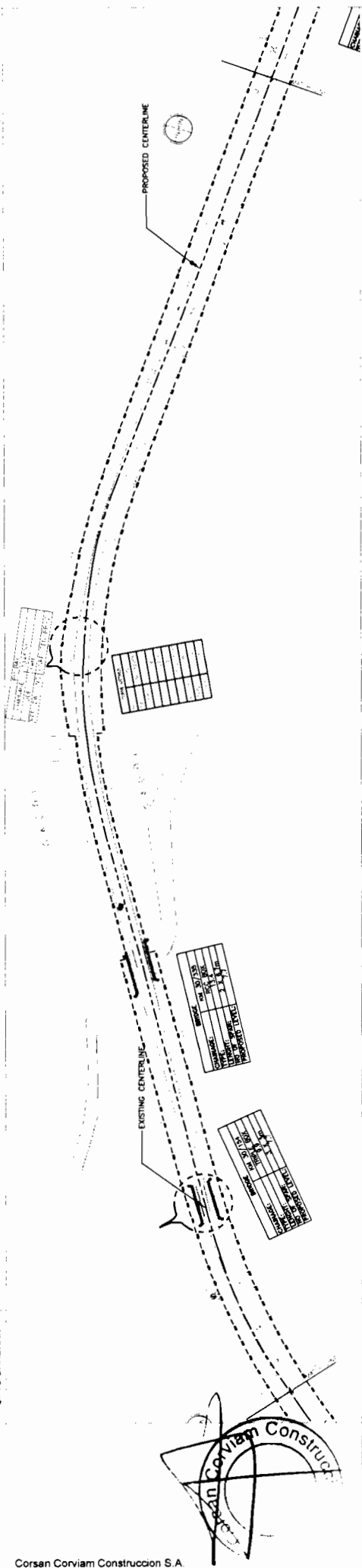
**LEGEND**  
 CENTERLINE  
 BOUNDARY  
 UTILITY  
 ...





TO CHANDBALI

TO BHADRAK



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

**CONSULTING ENGINEER, WBPROUP LTD.**  
 CEG

**LEGEND**

- EXISTING CENTERLINE
- PROPOSED CENTERLINE
- EXISTING GROUND PROFILE
- PROPOSED PROFILE
- CHAINAGE
- SUPERELEVATION / CROSSFALL
- VERTICAL PROFILE
- HORIZONTAL ALIGNMENT
- EXISTING LEVEL (m)
- PROPOSED ROAD LEVEL (m)
- DATUM = 0.00

**WIDENING AND STRENGTHENING TO TWO LANE**

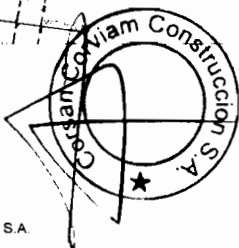
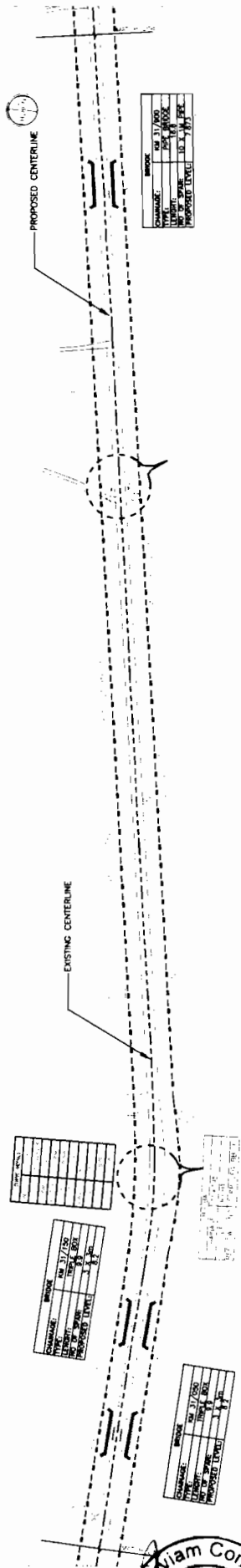
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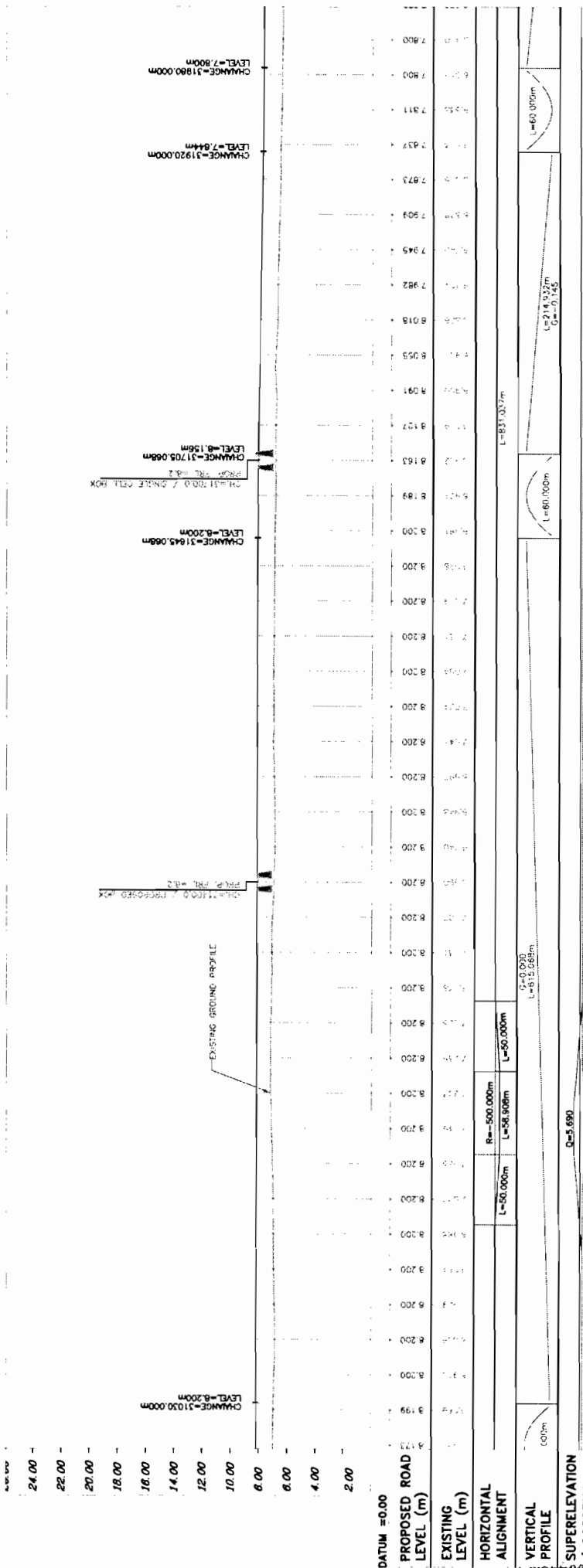
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TO BHADRAK

TO CHANDBAL



Corisan Corviam Construction S.A.  
Contractor



WIDENING AND STRENGTHENING TO TWO LANE

CONSULTING PROJECT:-  
**C E G ENGINEERING, WB GROUP LTD.**  
ORISSA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

LEGEND

EXISTING ROAD LEVEL (m)

PROPOSED ROAD LEVEL (m)

EXISTING GROUND PROFILE

HORIZONTAL ALIGNMENT

VERTICAL PROFILE

SUPERELEVATION

CROSSFALL

CHANGING

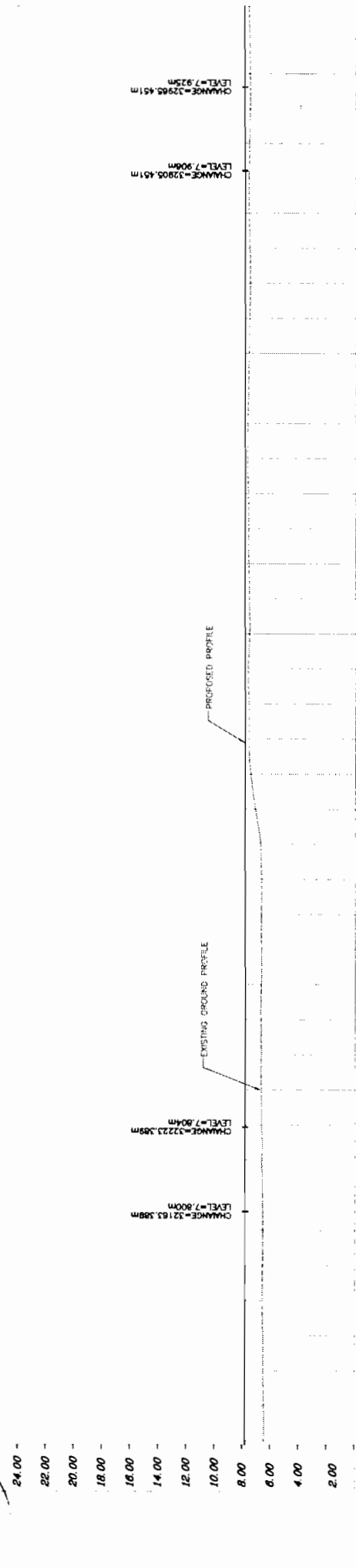
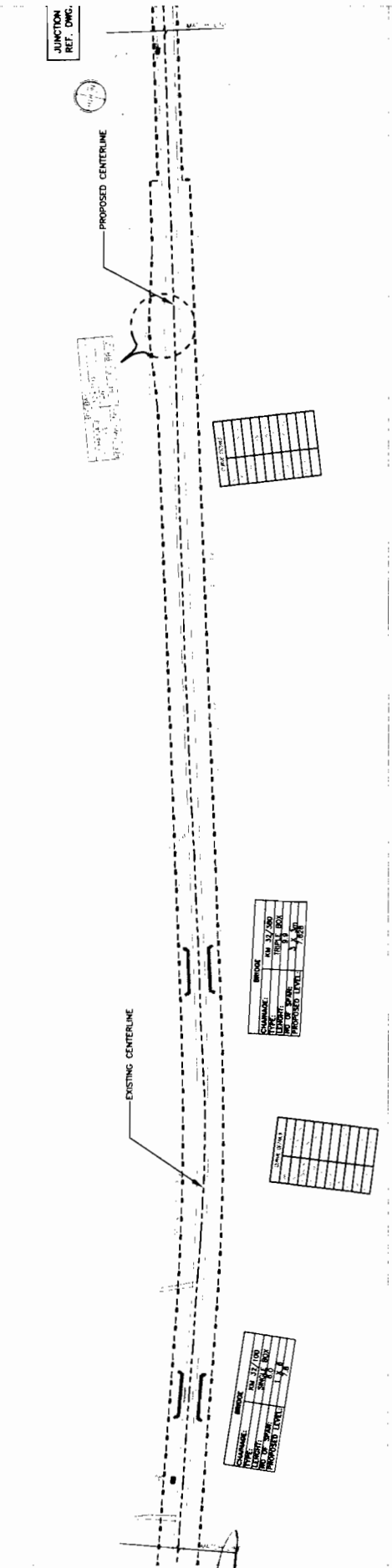
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STATION	CHANGING LEVEL
3199.000	8.200m
3200.000	8.200m
3201.000	8.200m
3202.000	8.200m
3203.000	8.200m
3204.000	8.200m
3205.000	8.200m
3206.000	8.200m
3207.000	8.200m
3208.000	8.200m
3209.000	8.200m
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3252.000	8.200m
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3255.000	8.200m
3256.000	8.200m
3257.000	8.200m
3258.000	8.200m
3259.000	8.200m
3260.000	8.200m
3261.000	8.200m
3262.000	8.200m
3263.000	8.200m
3264.000	8.200m
3265.000	8.200m
3266.000	8.200m
3267.000	8.200m
3268.000	8.200m
3269.000	8.200m
3270.000	8.200m
3271.000	8.200m
3272.000	8.200m
3273.000	8.200m
3274.000	8.200m
3275.000	8.200m
3276.000	8.200m
3277.000	8.200m
3278.000	8.200m
3279.000	8.200m
3280.000	8.200m
3281.000	8.200m
3282.000	8.200m
3283.000	8.200m
3284.000	8.200m
3285.000	8.200m
3286.000	8.200m
3287.000	8.200m
3288.000	8.200m
3289.000	8.200m
3290.000	8.200m
3291.000	8.200m
3292.000	8.200m
3293.000	8.200m
3294.000	8.200m
3295.000	8.200m
3296.000	8.200m
3297.000	8.200m
3298.000	8.200m
3299.000	8.200m
3300.000	8.200m

WORLD BANK PROJECT  
O/o the E.I.C. (G.W.P.) Odisha  
Bhubaneswar.

← TO BHADRAK

TO CHANDBAL →



DATUM = 0.00	PROPOSED ROAD LEVEL (m)	EXISTING LEVEL (m)
7.900	7.900	7.900
7.905	7.905	7.905
7.910	7.910	7.910
7.915	7.915	7.915
7.920	7.920	7.920
7.925	7.925	7.925
7.930	7.930	7.930
7.935	7.935	7.935
7.940	7.940	7.940
7.945	7.945	7.945
7.950	7.950	7.950
7.955	7.955	7.955
7.960	7.960	7.960
7.965	7.965	7.965
7.970	7.970	7.970
7.975	7.975	7.975
7.980	7.980	7.980
7.985	7.985	7.985
7.990	7.990	7.990
7.995	7.995	7.995
8.000	8.000	8.000
8.005	8.005	8.005
8.010	8.010	8.010
8.015	8.015	8.015
8.020	8.020	8.020
8.025	8.025	8.025
8.030	8.030	8.030
8.035	8.035	8.035
8.040	8.040	8.040
8.045	8.045	8.045
8.050	8.050	8.050
8.055	8.055	8.055
8.060	8.060	8.060
8.065	8.065	8.065
8.070	8.070	8.070
8.075	8.075	8.075
8.080	8.080	8.080
8.085	8.085	8.085
8.090	8.090	8.090
8.095	8.095	8.095
8.100	8.100	8.100
8.105	8.105	8.105
8.110	8.110	8.110
8.115	8.115	8.115
8.120	8.120	8.120
8.125	8.125	8.125
8.130	8.130	8.130
8.135	8.135	8.135
8.140	8.140	8.140
8.145	8.145	8.145
8.150	8.150	8.150
8.155	8.155	8.155
8.160	8.160	8.160
8.165	8.165	8.165
8.170	8.170	8.170
8.175	8.175	8.175
8.180	8.180	8.180
8.185	8.185	8.185
8.190	8.190	8.190
8.195	8.195	8.195
8.200	8.200	8.200
8.205	8.205	8.205
8.210	8.210	8.210
8.215	8.215	8.215
8.220	8.220	8.220
8.225	8.225	8.225
8.230	8.230	8.230
8.235	8.235	8.235
8.240	8.240	8.240
8.245	8.245	8.245
8.250	8.250	8.250
8.255	8.255	8.255
8.260	8.260	8.260
8.265	8.265	8.265
8.270	8.270	8.270
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8.300	8.300	8.300
8.305	8.305	8.305
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8.315	8.315	8.315
8.320	8.320	8.320
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8.330	8.330	8.330
8.335	8.335	8.335
8.340	8.340	8.340
8.345	8.345	8.345
8.350	8.350	8.350
8.355	8.355	8.355
8.360	8.360	8.360
8.365	8.365	8.365
8.370	8.370	8.370
8.375	8.375	8.375
8.380	8.380	8.380
8.385	8.385	8.385
8.390	8.390	8.390
8.395	8.395	8.395
8.400	8.400	8.400
8.405	8.405	8.405
8.410	8.410	8.410
8.415	8.415	8.415
8.420	8.420	8.420
8.425	8.425	8.425
8.430	8.430	8.430
8.435	8.435	8.435
8.440	8.440	8.440
8.445	8.445	8.445
8.450	8.450	8.450
8.455	8.455	8.455
8.460	8.460	8.460
8.465	8.465	8.465
8.470	8.470	8.470
8.475	8.475	8.475
8.480	8.480	8.480
8.485	8.485	8.485
8.490	8.490	8.490
8.495	8.495	8.495
8.500	8.500	8.500
8.505	8.505	8.505
8.510	8.510	8.510
8.515	8.515	8.515
8.520	8.520	8.520
8.525	8.525	8.525
8.530	8.530	8.530
8.535	8.535	8.535
8.540	8.540	8.540
8.545	8.545	8.545
8.550	8.550	8.550
8.555	8.555	8.555
8.560	8.560	8.560
8.565	8.565	8.565
8.570	8.570	8.570
8.575	8.575	8.575
8.580	8.580	8.580
8.585	8.585	8.585
8.590	8.590	8.590
8.595	8.595	8.595
8.600	8.600	8.600
8.605	8.605	8.605
8.610	8.610	8.610
8.615	8.615	8.615
8.620	8.620	8.620
8.625	8.625	8.625
8.630	8.630	8.630
8.635	8.635	8.635
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8.790	8.790	8.790
8.795	8.795	8.795
8.800	8.800	8.800
8.805	8.805	8.805
8.810	8.810	8.810
8.815	8.815	8.815
8.820	8.820	8.820
8.825	8.825	8.825
8.830	8.830	8.830
8.835	8.835	8.835
8.840	8.840	8.840
8.845	8.845	8.845
8.850	8.850	8.850
8.855	8.855	8.855
8.860	8.860	8.860
8.865	8.865	8.865
8.870	8.870	8.870
8.875	8.875	8.875
8.880	8.880	8.880
8.885	8.885	8.885
8.890	8.890	8.890
8.895	8.895	8.895
8.900	8.900	8.900
8.905	8.905	8.905
8.910	8.910	8.910
8.915	8.915	8.915
8.920	8.920	8.920
8.925	8.925	8.925
8.930	8.930	8.930
8.935	8.935	8.935
8.940	8.940	8.940
8.945	8.945	8.945
8.950	8.950	8.950
8.955	8.955	8.955
8.960	8.960	8.960
8.965	8.965	8.965
8.970	8.970	8.970
8.975	8.975	8.975
8.980	8.980	8.980
8.985	8.985	8.985
8.990	8.990	8.990
8.995	8.995	8.995
9.000	9.000	9.000

**LEGEND**

- PROPOSED ROAD LEVEL
- EXISTING LEVEL
- EXISTING GROUND PROFILE
- PROPOSED PROFILE
- EXISTING CENTERLINE
- PROPOSED CENTERLINE
- BRIDGE
- CHANGAGE
- LEVEL
- TO BHADRAK
- TO CHANDBAL

**PROJECT:-**  
**CONSULTING ENGINEER, WBPROUP LTD.**  
 ORISSA STATE ROAD PROJECT  
 UNDER WORLD BANK ASSISTANCE

**WIDENING AND STRENGTHENING TO TWO LANE**

**VERTICAL**

**HORIZONTAL**

**CHANGAGE**

**SUPERELEVATION**

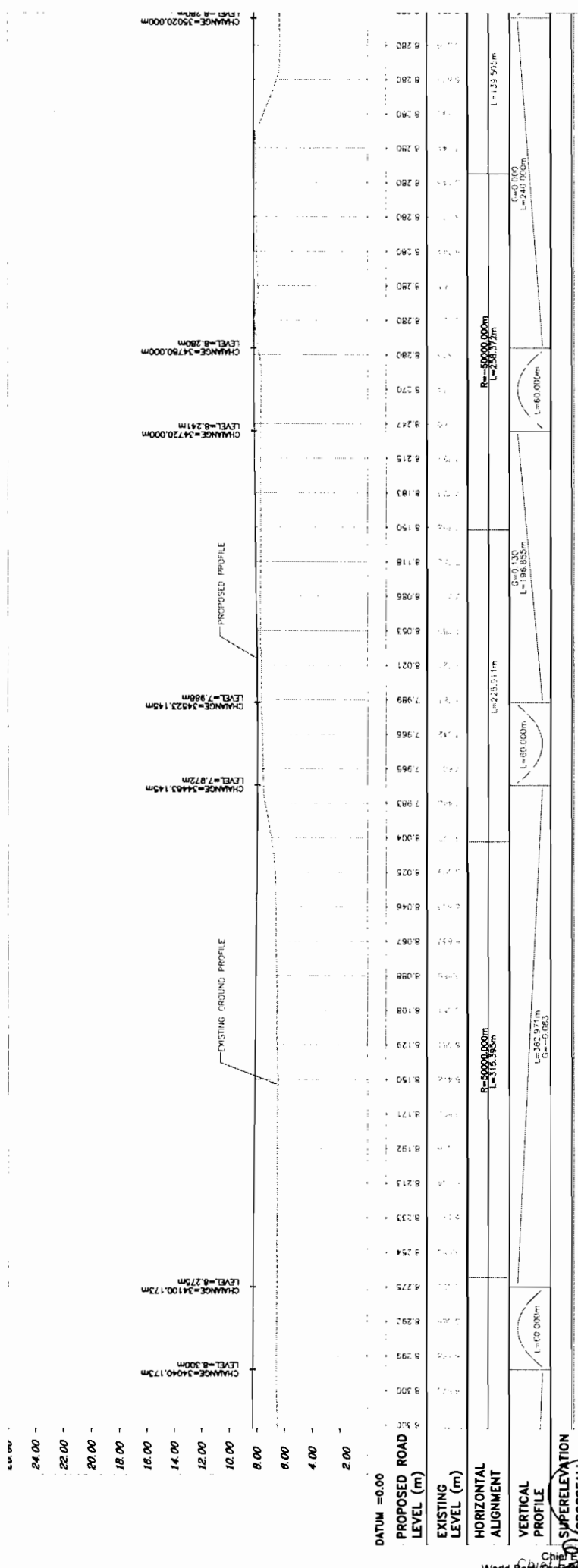
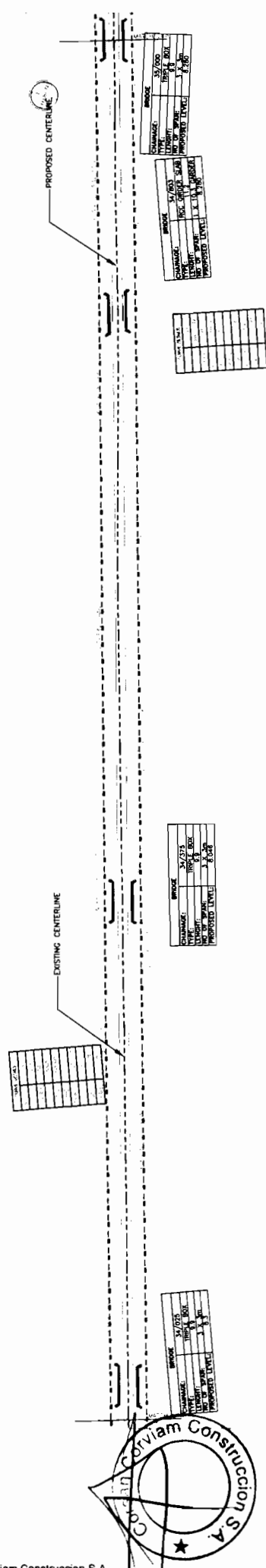
**CROSSFALL**





TO BHADRAK

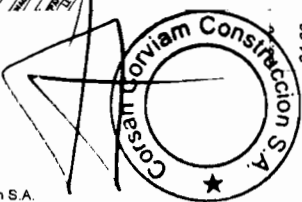
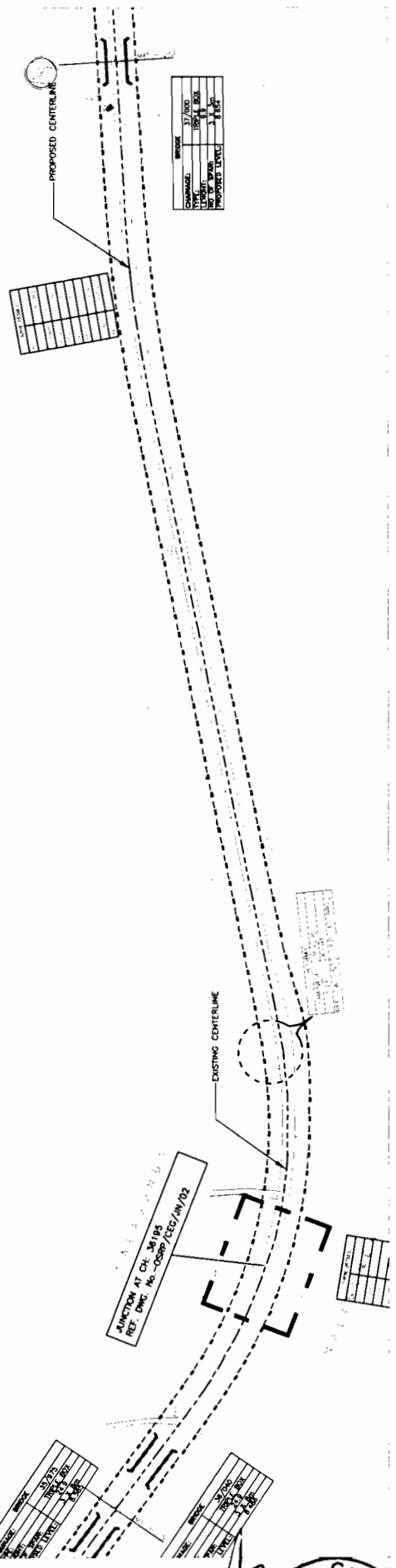
TO CHANDBALL



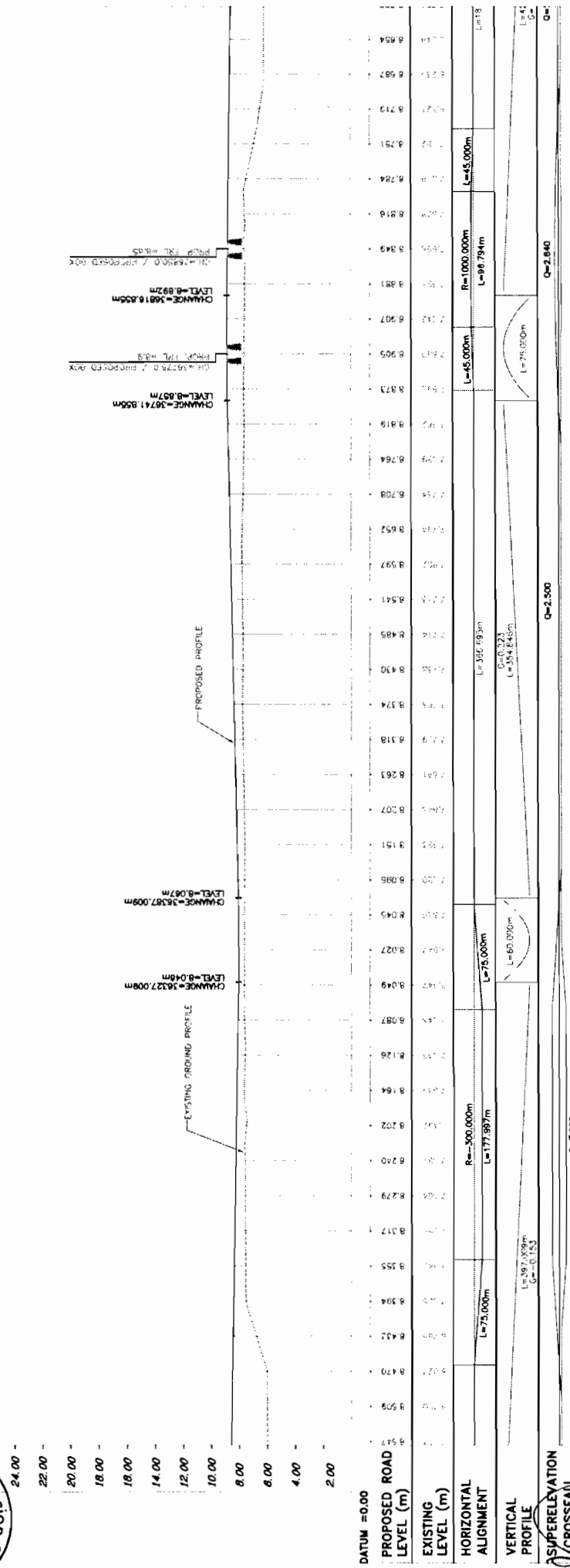


TO BHADRAK

TO CHANDBALI



Corsan Corviam Construccion S.A.  
Contractor



Stationing	Proposed Road Level (m)	Existing Level (m)
3500.000	10.00	10.00
3505.000	10.00	10.00
3510.000	10.00	10.00
3515.000	10.00	10.00
3520.000	10.00	10.00
3525.000	10.00	10.00
3530.000	10.00	10.00
3535.000	10.00	10.00
3540.000	10.00	10.00
3545.000	10.00	10.00
3550.000	10.00	10.00
3555.000	10.00	10.00
3560.000	10.00	10.00
3565.000	10.00	10.00
3570.000	10.00	10.00
3575.000	10.00	10.00
3580.000	10.00	10.00
3585.000	10.00	10.00
3590.000	10.00	10.00
3595.000	10.00	10.00
3600.000	10.00	10.00
3605.000	10.00	10.00
3610.000	10.00	10.00
3615.000	10.00	10.00
3620.000	10.00	10.00
3625.000	10.00	10.00
3630.000	10.00	10.00
3635.000	10.00	10.00
3640.000	10.00	10.00
3645.000	10.00	10.00
3650.000	10.00	10.00
3655.000	10.00	10.00
3660.000	10.00	10.00
3665.000	10.00	10.00
3670.000	10.00	10.00
3675.000	10.00	10.00
3680.000	10.00	10.00
3685.000	10.00	10.00
3690.000	10.00	10.00
3695.000	10.00	10.00
3700.000	10.00	10.00

**WIDENING AND STRENGTHENING TO TWO LANE**

PROJECT: ORISSA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE

ENGINEER: WBP GROUP LTD.

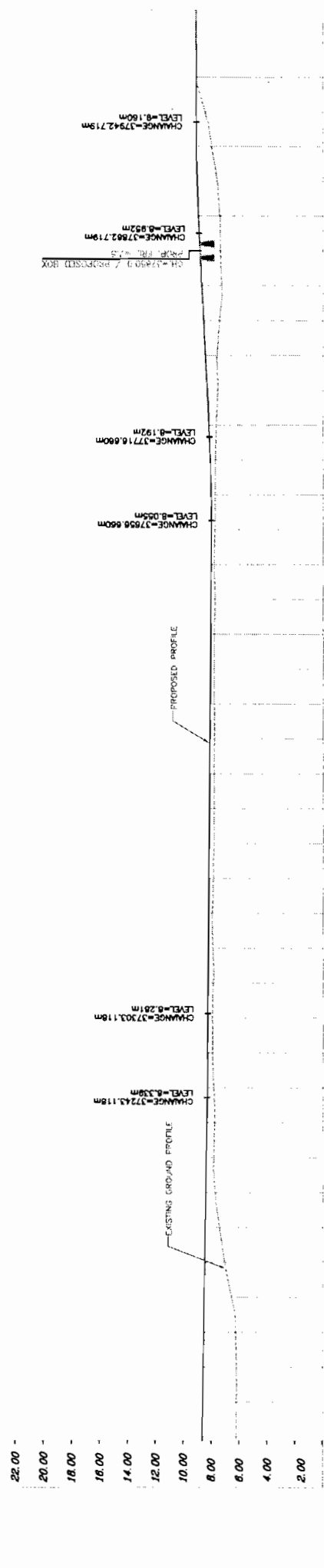
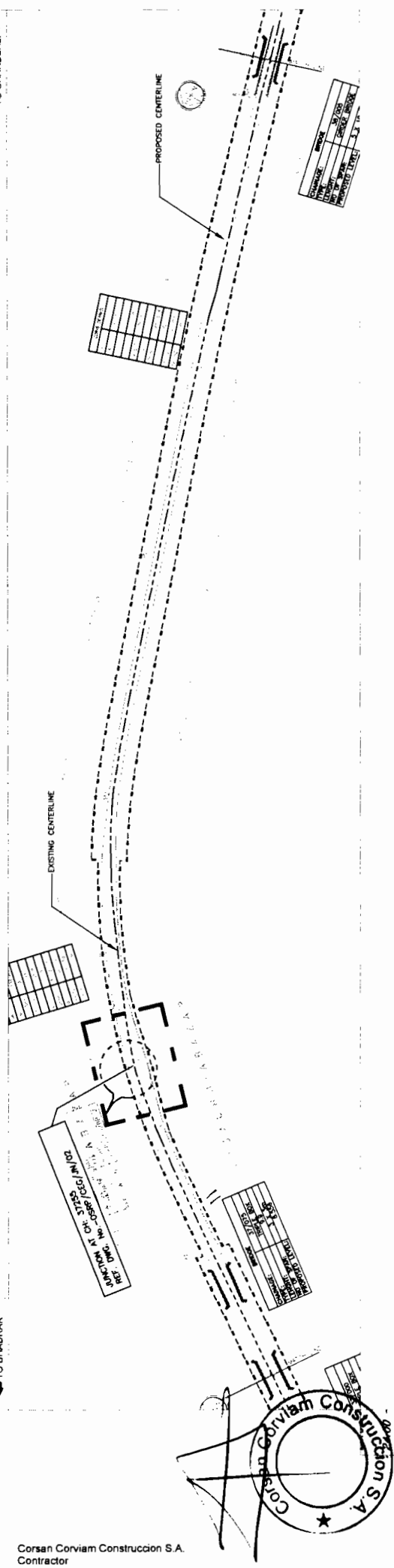
LEGEND

- PROPOSED CENTERLINE
- EXISTING CENTERLINE
- PROPOSED PROFILE
- EXISTING GROUND PROFILE
- MANHOLE
- DRAINAGE STRUCTURE
- VERTICAL CURVE
- HORIZONTAL CURVE
- CHANGING LEVEL
- PROPOSED LEVEL

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

TO CHANDBALI

TO BHADRAK



STATIONING	PROPOSED ROAD LEVEL (m)	EXISTING LEVEL (m)	HORIZONTAL ALIGNMENT	VERTICAL PROFILE
37200.000	8.554	8.554	L=18.724m	L=428.203m G=-0.150
37225.000	8.525	8.525	L=90.000m	Q=2.500
37250.000	8.530	8.530	L=90.000m	Q=2.500
37275.000	8.537	8.537	L=90.000m	Q=2.500
37300.000	8.543	8.543	R=500.000m L=235.860m	Q=2.500
37325.000	8.549	8.549	L=90.000m	Q=2.500
37350.000	8.551	8.551	L=90.000m	Q=2.500
37375.000	8.551	8.551	L=90.000m	Q=2.500
37400.000	8.551	8.551	L=90.000m	Q=2.500
37425.000	8.551	8.551	L=90.000m	Q=2.500
37450.000	8.551	8.551	L=90.000m	Q=2.500
37475.000	8.551	8.551	L=90.000m	Q=2.500
37500.000	8.551	8.551	L=90.000m	Q=2.500
37525.000	8.551	8.551	L=90.000m	Q=2.500
37550.000	8.551	8.551	L=90.000m	Q=2.500
37575.000	8.551	8.551	L=90.000m	Q=2.500
37600.000	8.551	8.551	L=90.000m	Q=2.500
37625.000	8.551	8.551	L=90.000m	Q=2.500
37650.000	8.551	8.551	L=90.000m	Q=2.500
37675.000	8.551	8.551	L=90.000m	Q=2.500
37700.000	8.551	8.551	L=90.000m	Q=2.500
37725.000	8.551	8.551	L=90.000m	Q=2.500
37750.000	8.551	8.551	L=90.000m	Q=2.500
37775.000	8.551	8.551	L=90.000m	Q=2.500
37800.000	8.551	8.551	L=90.000m	Q=2.500
37825.000	8.551	8.551	L=90.000m	Q=2.500
37850.000	8.551	8.551	L=90.000m	Q=2.500
37875.000	8.551	8.551	L=90.000m	Q=2.500
37900.000	8.551	8.551	L=90.000m	Q=2.500
37925.000	8.551	8.551	L=90.000m	Q=2.500
37950.000	8.551	8.551	L=90.000m	Q=2.500
37975.000	8.551	8.551	L=90.000m	Q=2.500
38000.000	8.551	8.551	L=90.000m	Q=2.500

**WIDENING AND STRENGTHENING TO TWO LANE**

**CONSULTING ENGINEER, WBPROUP LTD.**  
ORISSA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

**LEGEND**

PROPOSED ROAD LEVEL (m)

EXISTING LEVEL (m)

HORIZONTAL ALIGNMENT

VERTICAL PROFILE

SUPERELEVATION

CROSSFALL

CHAINAGE

DATUM = 0.00

PROPOSED ROAD LEVEL (m)

EXISTING LEVEL (m)

HORIZONTAL ALIGNMENT

VERTICAL PROFILE

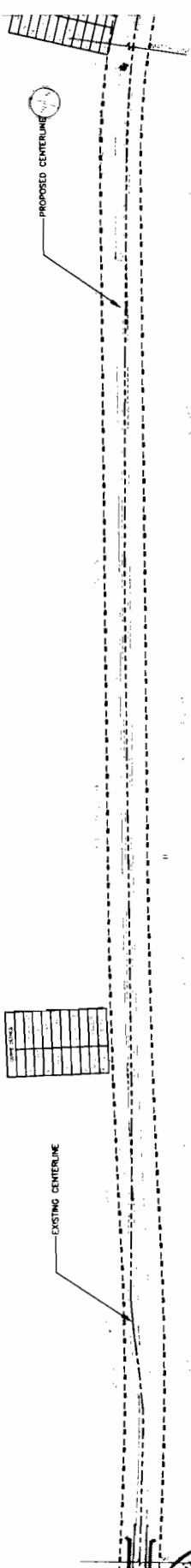
SUPERELEVATION

CROSSFALL

CHAINAGE

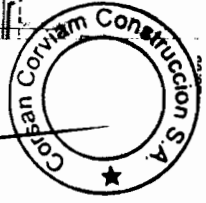
TO BHADRAK

TO CHANBALI

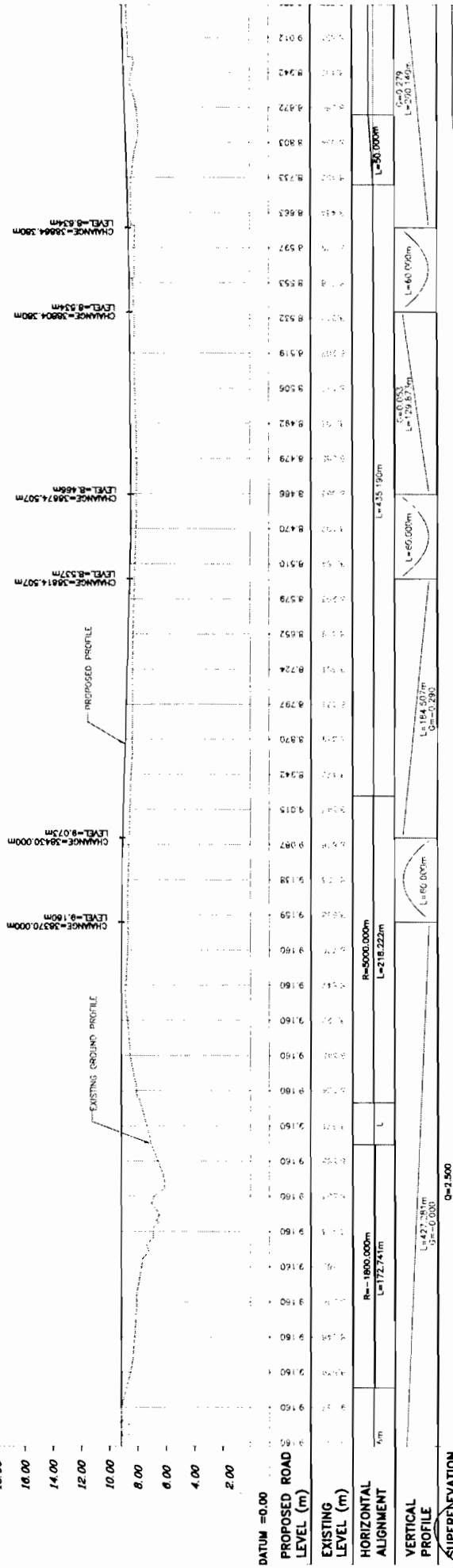


Station	Level (m)
9+00	10.00
9+10	10.00
9+20	10.00
9+30	10.00
9+40	10.00
9+50	10.00
9+60	10.00
9+70	10.00
9+80	10.00
9+90	10.00
10+00	10.00

Station	Level (m)
9+00	10.00
9+10	10.00
9+20	10.00
9+30	10.00
9+40	10.00
9+50	10.00
9+60	10.00
9+70	10.00
9+80	10.00
9+90	10.00
10+00	10.00



Corisan Corviam Construction S.A.  
Contractor



Station	Level (m)	Vertical Curve Data
9+00	10.00	
9+10	10.00	
9+20	10.00	
9+30	10.00	
9+40	10.00	
9+50	10.00	
9+60	10.00	
9+70	10.00	
9+80	10.00	
9+90	10.00	
10+00	10.00	

**LEGEND**

	EXISTING GROUND PROFILE
	PROPOSED ROAD PROFILE
	VERTICAL CURVE
	HORIZONTAL CURVE
	CHAINAGE

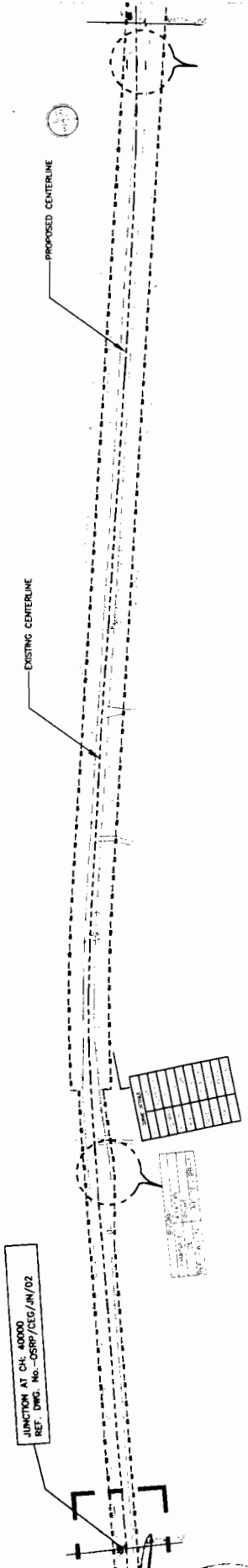
**CONSULTING PROJECT:**  
**ENGINEER, WBPROUP LTD.**  
 ORISSA STATE ROAD PROJECT  
 UNDER WORLD BANK ASSISTANCE

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

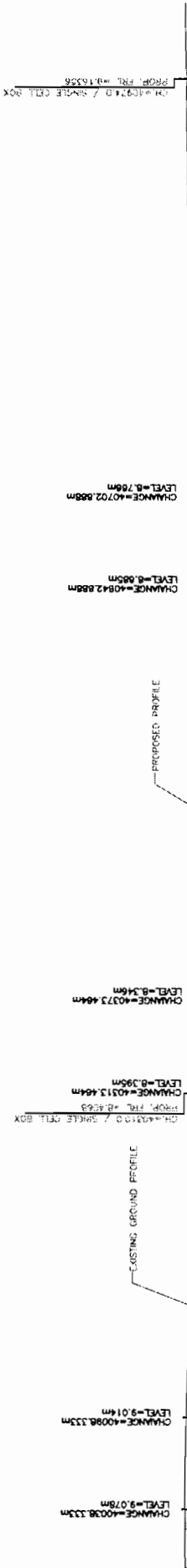


TO BHADRAK

TO CHANDBAL



JUNCTION AT CHL 40000  
 REF. DWG. NO. ---OSRP/CEG/JN/02



PROP. FILL @ 1:0.50  
 CH=4008.333 / SINGLE CELL BOX

PROP. FILL @ 0.50  
 CH=4008.333 / SINGLE CELL BOX

CHANGE=4084.288m  
 LEVEL=8.080m

CHANGE=4072.888m  
 LEVEL=8.788m

CHANGE=4037.464m  
 LEVEL=8.346m

CHANGE=4031.464m  
 LEVEL=8.395m

CHANGE=4008.333m  
 LEVEL=9.078m

CHANGE=4008.333m  
 LEVEL=9.014m

24.00 -  
 22.00 -  
 20.00 -  
 18.00 -  
 16.00 -  
 14.00 -  
 12.00 -  
 10.00 -  
 8.00 -  
 6.00 -  
 4.00 -  
 2.00 -

PROPOSED ROAD LEVEL (m)	EXISTING LEVEL (m)	ALIGNMENT	VERTICAL PROFILE	SUPERELEVATION	CROSSFALL
9.202	9.165				
9.129	9.092				
9.055	8.918				
8.982	8.845				
8.909	8.772				
8.836	8.699				
8.763	8.626				
8.690	8.553				
8.617	8.480				
8.544	8.407				
8.471	8.334				
8.398	8.261				
8.325	8.188				
8.252	8.115				
8.179	8.042				
8.106	7.969				
8.033	7.896				
7.960	7.823				
7.887	7.750				
7.814	7.677				
7.741	7.604				
7.668	7.531				
7.595	7.458				
7.522	7.385				
7.449	7.312				
7.376	7.239				
7.303	7.166				
7.230	7.093				
7.157	7.020				
7.084	6.947				
7.011	6.874				
6.938	6.801				
6.865	6.728				
6.792	6.655				
6.719	6.582				
6.646	6.509				
6.573	6.436				
6.500	6.363				
6.427	6.290				
6.354	6.217				
6.281	6.144				
6.208	6.071				
6.135	5.998				
6.062	5.925				
5.989	5.852				
5.916	5.779				
5.843	5.706				
5.770	5.633				
5.697	5.560				
5.624	5.487				
5.551	5.414				
5.478	5.341				
5.405	5.268				
5.332	5.195				
5.259	5.122				
5.186	5.049				
5.113	4.976				
5.040	4.903				
4.967	4.830				
4.894	4.757				
4.821	4.684				
4.748	4.611				
4.675	4.538				
4.602	4.465				
4.529	4.392				
4.456	4.319				
4.383	4.246				
4.310	4.173				
4.237	4.100				
4.164	4.027				
4.091	3.954				
4.018	3.881				
3.945	3.808				
3.872	3.735				
3.799	3.662				
3.726	3.589				
3.653	3.516				
3.580	3.443				
3.507	3.370				
3.434	3.297				
3.361	3.224				
3.288	3.151				
3.215	3.078				
3.142	3.005				
3.069	2.932				
3.000	2.859				
2.931	2.786				
2.862	2.713				
2.793	2.640				
2.724	2.567				
2.655	2.494				
2.586	2.421				
2.517	2.348				
2.448	2.275				
2.379	2.202				
2.310	2.129				
2.241	2.056				
2.172	1.983				
2.103	1.910				
2.034	1.837				
1.965	1.764				
1.896	1.691				
1.827	1.618				
1.758	1.545				
1.689	1.472				
1.620	1.399				
1.551	1.326				
1.482	1.253				
1.413	1.180				
1.344	1.107				
1.275	1.034				
1.206	0.961				
1.137	0.888				
1.068	0.815				
1.000	0.742				
9.300	9.263				
9.200	9.163				
9.100	9.063				
9.000	8.963				
8.900	8.863				
8.800	8.763				
8.700	8.663				
8.600	8.563				
8.500	8.463				
8.400	8.363				
8.300	8.263				
8.200	8.163				
8.100	8.063				
8.000	7.963				
7.900	7.863				
7.800	7.763				
7.700	7.663				
7.600	7.563				
7.500	7.463				
7.400	7.363				
7.300	7.263				
7.200	7.163				
7.100	7.063				
7.000	6.963				
6.900	6.863				
6.800	6.763				
6.700	6.663				
6.600	6.563				
6.500	6.463				
6.400	6.363				
6.300	6.263				
6.200	6.163				
6.100	6.063				
6.000	5.963				
5.900	5.863				
5.800	5.763				
5.700	5.663				
5.600	5.563				
5.500	5.463				
5.400	5.363				
5.300	5.263				
5.200	5.163				
5.100	5.063				
5.000	4.963				
4.900	4.863				
4.800	4.763				
4.700	4.663				
4.600	4.563				
4.500	4.463				
4.400	4.363				
4.300	4.263				
4.200	4.163				
4.100	4.063				
4.000	3.963				
3.900	3.863				
3.800	3.763				
3.700	3.663				
3.600	3.563				
3.500	3.463				
3.400	3.363				
3.300	3.263				
3.200	3.163				
3.100	3.063				
3.000	2.963				
2.900	2.863				
2.800	2.763				
2.700	2.663				
2.600	2.563				
2.500	2.463				
2.400	2.363				
2.300	2.263				
2.200	2.163				
2.100	2.063				
2.000	1.963				
1.900	1.863				
1.800	1.763				
1.700	1.663				
1.600	1.563				
1.500	1.463				
1.400	1.363				
1.300	1.263				
1.200	1.163				
1.100	1.063				
1.000	0.963				
9.000	8.963				
8.000	7.963				
7.000	6.963				
6.000	5.963				
5.000	4.963				
4.000	3.963				
3.000	2.963				
2.000	1.963				
1.000	0.963				
0.000	-0.037				

**WIDENING AND STRENGTHENING TO TWO LANE**

ORISSA STATE ROAD PROJECT  
 UNDER WORLD BANK ASSISTANCE

**CEG CONSULTING PROJECT ENGINEER, WBPROUP LTD.**

LEGEND

- PROPOSED CENTERLINE
- EXISTING CENTERLINE
- PROPOSED PROFILE
- EXISTING GROUND PROFILE
- PROPOSED ROAD LEVEL
- EXISTING ROAD LEVEL
- PROPOSED CROSSFALL
- EXISTING CROSSFALL
- PROPOSED SUPERELEVATION
- EXISTING SUPERELEVATION
- PROPOSED ALIGNMENT
- EXISTING ALIGNMENT
- PROPOSED CHAINAGE
- EXISTING CHAINAGE

Scale: 1:1000

DATE: 10/10/2011

PROJECT NO: OSRP/CEG/JN/02

DESIGNER: [Signature]

CHECKER: [Signature]

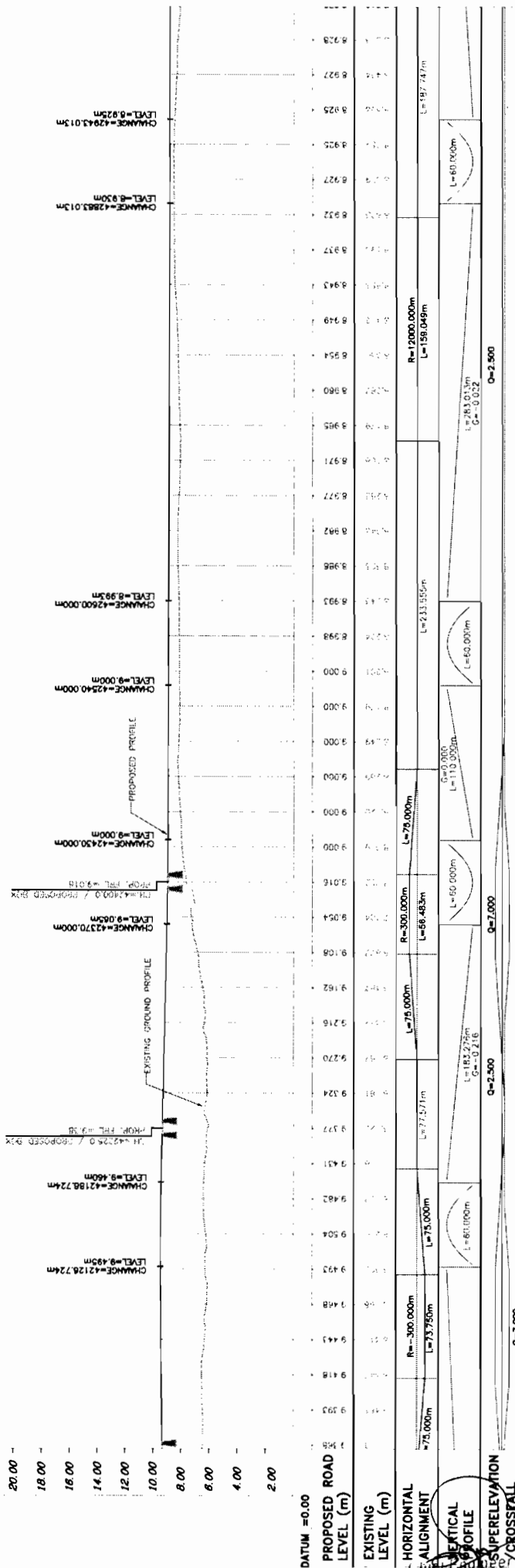
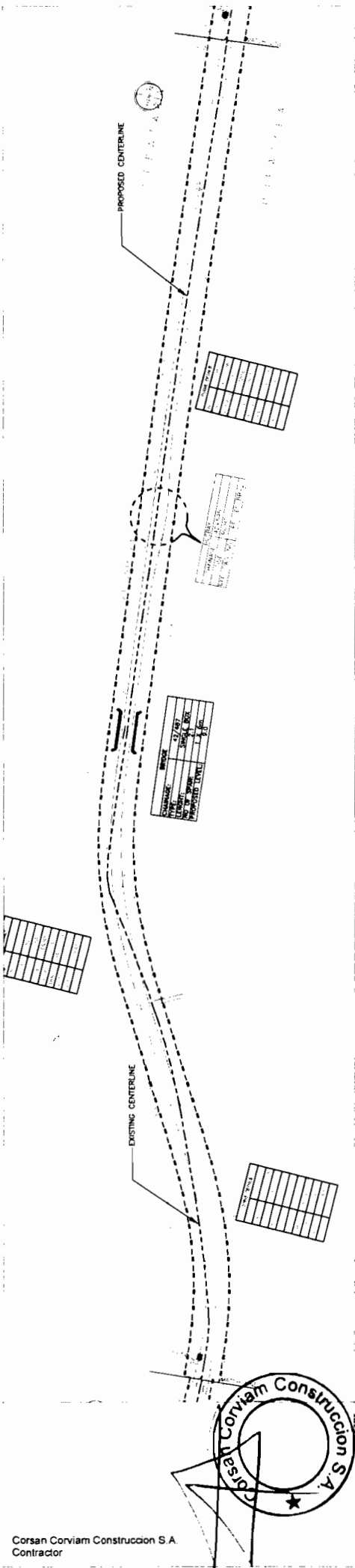
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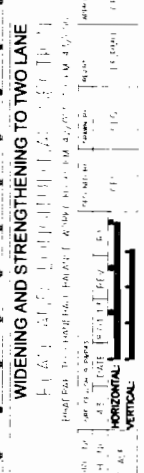


TO BHADRAK

TO CHANDBAL



Stationing	Existing Level (m)	Proposed Level (m)	Vertical Curve Data
42126.724	8.495	8.195	L=75.000m, G=-0.216
42186.724	8.195	8.195	L=61.000m, G=-0.216
42370.000	9.005	9.005	L=75.000m, G=0.000
42500.000	9.000	9.000	L=110.000m, G=0.000
42600.000	8.995	8.995	L=60.000m, G=0.000
42883.013	8.930	8.930	L=233.350m, G=0.000
42943.013	8.925	8.925	L=197.747m, G=0.000



**WIDENING AND STRENGTHENING TO TWO LANE**

PROJECT: ORISSA STATE ROAD PROJECT  
 UNDER WORLD BANK ASSISTANCE

**CONSULTING ENGINEER, WB GROUP LTD.**

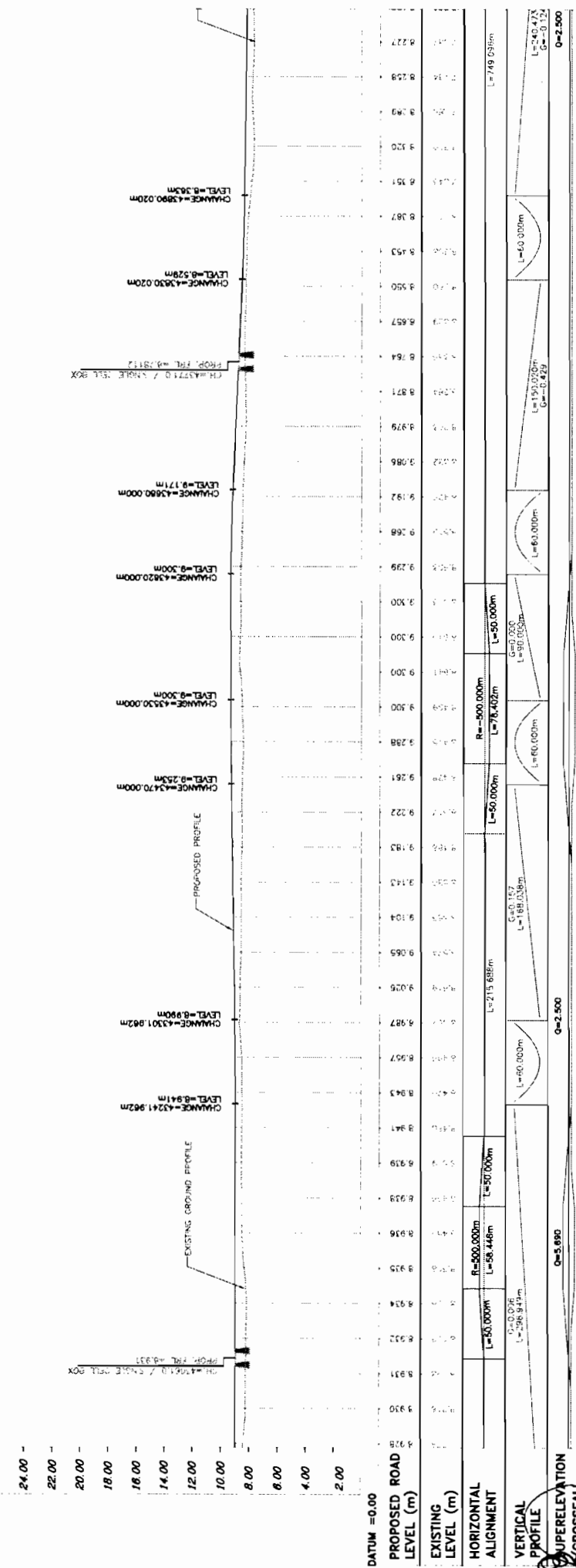
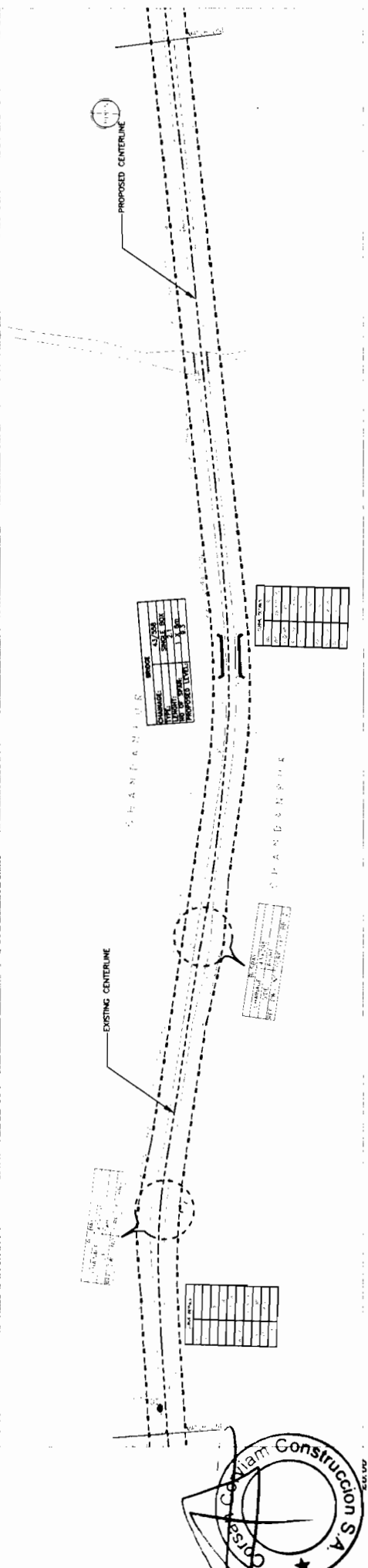
PROJECT: ORISSA STATE ROAD PROJECT  
 UNDER WORLD BANK ASSISTANCE

**LEGEND**

EXISTING CENTERLINE	PROPOSED CENTERLINE
EXISTING GROUND PROFILE	PROPOSED PROFILE
EXISTING ROAD PROFILE	PROPOSED ROAD PROFILE
EXISTING SUPERELEVATION	PROPOSED SUPERELEVATION
EXISTING CROSSFALL	PROPOSED CROSSFALL
EXISTING CHAINAGE	PROPOSED CHAINAGE
EXISTING LEVEL	PROPOSED LEVEL
EXISTING CHANGING POINT	PROPOSED CHANGING POINT
EXISTING END POINT	PROPOSED END POINT
EXISTING START POINT	PROPOSED START POINT
EXISTING MILEAGE	PROPOSED MILEAGE
EXISTING DISTANCE	PROPOSED DISTANCE
EXISTING AREA	PROPOSED AREA
EXISTING VOLUME	PROPOSED VOLUME
EXISTING WEIGHT	PROPOSED WEIGHT
EXISTING LENGTH	PROPOSED LENGTH
EXISTING WIDTH	PROPOSED WIDTH
EXISTING HEIGHT	PROPOSED HEIGHT
EXISTING DEPTH	PROPOSED DEPTH
EXISTING TEMPERATURE	PROPOSED TEMPERATURE
EXISTING PRESSURE	PROPOSED PRESSURE
EXISTING FORCE	PROPOSED FORCE
EXISTING ENERGY	PROPOSED ENERGY
EXISTING POWER	PROPOSED POWER
EXISTING TORQUE	PROPOSED TORQUE
EXISTING MOMENT	PROPOSED MOMENT
EXISTING STRESS	PROPOSED STRESS
EXISTING STRAIN	PROPOSED STRAIN
EXISTING ELONGATION	PROPOSED ELONGATION
EXISTING CONTRACTION	PROPOSED CONTRACTION
EXISTING EXPANSION	PROPOSED EXPANSION
EXISTING SHRINKAGE	PROPOSED SHRINKAGE
EXISTING SWELLING	PROPOSED SWELLING
EXISTING SETTLEMENT	PROPOSED SETTLEMENT
EXISTING UPLIFT	PROPOSED UPLIFT
EXISTING SLOPE	PROPOSED SLOPE
EXISTING GRADE	PROPOSED GRADE
EXISTING ELEVATION	PROPOSED ELEVATION
EXISTING ALTITUDE	PROPOSED ALTITUDE
EXISTING DEPTH	PROPOSED DEPTH
EXISTING DISTANCE	PROPOSED DISTANCE
EXISTING LENGTH	PROPOSED LENGTH
EXISTING WIDTH	PROPOSED WIDTH
EXISTING HEIGHT	PROPOSED HEIGHT
EXISTING DEPTH	PROPOSED DEPTH
EXISTING TEMPERATURE	PROPOSED TEMPERATURE
EXISTING PRESSURE	PROPOSED PRESSURE
EXISTING FORCE	PROPOSED FORCE
EXISTING ENERGY	PROPOSED ENERGY
EXISTING POWER	PROPOSED POWER
EXISTING TORQUE	PROPOSED TORQUE
EXISTING MOMENT	PROPOSED MOMENT
EXISTING STRESS	PROPOSED STRESS
EXISTING STRAIN	PROPOSED STRAIN
EXISTING ELONGATION	PROPOSED ELONGATION
EXISTING CONTRACTION	PROPOSED CONTRACTION
EXISTING EXPANSION	PROPOSED EXPANSION
EXISTING SHRINKAGE	PROPOSED SHRINKAGE
EXISTING SWELLING	PROPOSED SWELLING
EXISTING SETTLEMENT	PROPOSED SETTLEMENT
EXISTING UPLIFT	PROPOSED UPLIFT
EXISTING SLOPE	PROPOSED SLOPE
EXISTING GRADE	PROPOSED GRADE
EXISTING ELEVATION	PROPOSED ELEVATION
EXISTING ALTITUDE	PROPOSED ALTITUDE

← TO BHADRAK

TO CHANDBAL →



**LEGEND**

**CEG**

**PROJECT:-**  
**CONSULTING ENGINEER, WBPROUP LTD.**  
 ORISSA STATE ROAD PROJECT  
 UNDER WORLD BANK ASSISTANCE

**WIDENING AND STRENGTHENING TO TWO LANE**

**VERTICAL**

**HORIZONTAL**

**CHAINAGE**

**DATE:** 10/01/2011

**SCALE:** 1:1000

**PROJECT NO.:** 10/01/2011

**DESIGNER:** [Signature]

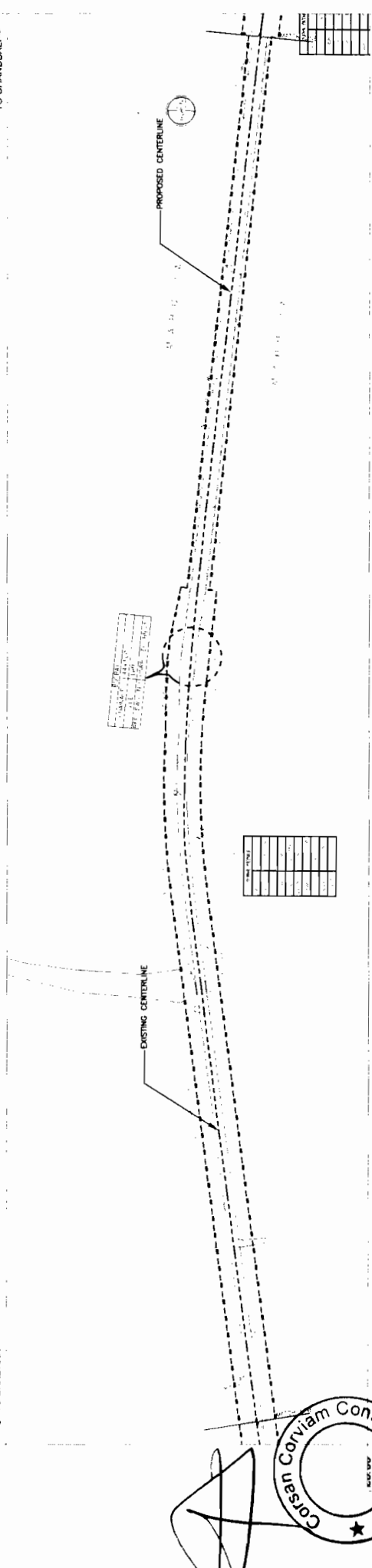
**CHECKER:** [Signature]

**APPROVED:** [Signature]

**DATE:** 10/01/2011

TO BHADRAK

TO CHANDBALI



CHAINAGE	PROPOSED ROAD LEVEL (m)	EXISTING LEVEL (m)	HORIZONTAL ALIGNMENT	VERTICAL PROFILE	CHAINAGE
4250.000	8.890	8.728	L=436.339m	G=0.225 L=336.191m	4530.000
4275.000	8.728	8.576	L=40.000m	G=0.225 L=336.191m	4555.000
4300.000	8.576	8.424	L=40.000m	G=0.225 L=336.191m	4580.000
4325.000	8.424	8.272	L=40.000m	G=0.225 L=336.191m	4605.000
4350.000	8.272	8.120	L=40.000m	G=0.225 L=336.191m	4630.000
4375.000	8.120	7.968	L=40.000m	G=0.225 L=336.191m	4655.000
4400.000	7.968	7.816	L=40.000m	G=0.225 L=336.191m	4680.000
4425.000	7.816	7.664	L=40.000m	G=0.225 L=336.191m	4705.000
4450.000	7.664	7.512	L=40.000m	G=0.225 L=336.191m	4730.000
4475.000	7.512	7.360	L=40.000m	G=0.225 L=336.191m	4755.000
4500.000	7.360	7.208	L=40.000m	G=0.225 L=336.191m	4780.000
4525.000	7.208	7.056	L=40.000m	G=0.225 L=336.191m	4805.000
4550.000	7.056	6.904	L=40.000m	G=0.225 L=336.191m	4830.000
4575.000	6.904	6.752	L=40.000m	G=0.225 L=336.191m	4855.000
4600.000	6.752	6.600	L=40.000m	G=0.225 L=336.191m	4880.000
4625.000	6.600	6.448	L=40.000m	G=0.225 L=336.191m	4905.000
4650.000	6.448	6.296	L=40.000m	G=0.225 L=336.191m	4930.000
4675.000	6.296	6.144	L=40.000m	G=0.225 L=336.191m	4955.000
4700.000	6.144	5.992	L=40.000m	G=0.225 L=336.191m	4980.000
4725.000	5.992	5.840	L=40.000m	G=0.225 L=336.191m	5005.000
4750.000	5.840	5.688	L=40.000m	G=0.225 L=336.191m	5030.000
4775.000	5.688	5.536	L=40.000m	G=0.225 L=336.191m	5055.000
4800.000					

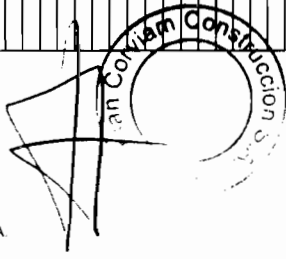






SCHEDULE OF SIGN POSTS

SIGN POST ID	DESCRIPTION OF SIGN BOARD	CHAMNAGE	LOCATION			REMARKS
			LL	LR	CR (L) CR (R)	
SP-12	PEDESTRIAN CROSSING	12730	✓	✓	✓	
		12830	✓	✓	✓	
		13170	✓	✓	✓	
		13270	✓	✓	✓	
		16442	✓	✓	✓	
		16542	✓	✓	✓	
		16600	✓	✓	✓	
		16900	✓	✓	✓	
		17858	✓	✓	✓	
		17958	✓	✓	✓	
		20142	✓	✓	✓	
		20242	✓	✓	✓	
		21358	✓	✓	✓	
		21458	✓	✓	✓	
		24182	✓	✓	✓	
		24282	✓	✓	✓	
		24508	✓	✓	✓	
		24808	✓	✓	✓	
		25160	✓	✓	✓	
		25280	✓	✓	✓	
		26208	✓	✓	✓	
		26308	✓	✓	✓	
		28542	✓	✓	✓	
		28642	✓	✓	✓	
		27730	✓	✓	✓	
		27830	✓	✓	✓	
		31198	✓	✓	✓	
		31298	✓	✓	✓	
		39442	✓	✓	✓	
		39542	✓	✓	✓	
		40158	✓	✓	✓	
		40258	✓	✓	✓	
		40830	✓	✓	✓	
		40930	✓	✓	✓	
		41842	✓	✓	✓	
		41942	✓	✓	✓	
		44442	✓	✓	✓	
SP-14 B	Y-INTERSECTION	44542	✓	✓	✓	
		6390	✓	✓	✓	
SP-14 C	Y-INTERSECTION	49900	✓	✓	✓	
		4060	✓	✓	✓	
SP-13 D	MAJOR ROAD AHEAD	16527	✓	✓	✓	
SP-16 A	HUMP OR ROUGH ROAD	120	✓	✓	✓	
		6500	✓	✓	✓	
		12235	✓	✓	✓	
		21420	✓	✓	✓	
		21890	✓	✓	✓	
		23252	✓	✓	✓	
		37255	✓	✓	✓	



Cersan Corviam Construcción S.A.  
Contractor

NOTE :-  
 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. IN STANDARD DRAWINGS

Chief Engineer  
 W.M. Bhadrak Bapatra  
 O/o the E.I.C. (Construction)  
 Bhubaneswar.

SIGN POST ID	DESCRIPTION OF SIGN BOARD	CHAMNAGE	LOCATION			REMARKS
			LL	LR	CR (L) CR (R)	
SP-16 A	HUMP OR ROUGH ROAD	3950	✓	✓	✓	
		16417	✓	✓	✓	
		17668	✓	✓	✓	
		18425	✓	✓	✓	
		19378	✓	✓	✓	
		33178	✓	✓	✓	
		36195	✓	✓	✓	
		40000	✓	✓	✓	
SP-17	STATE ROUTE	0	✓	✓	✓	
		27000	✓	✓	✓	
		25000	✓	✓	✓	
SP-20	REASSURANCE SIGN MARKER SIGN	4500	✓	✓	✓	
		6000	✓	✓	✓	
		18000	✓	✓	✓	
SP-22	PETROL BUNK	34000	✓	✓	✓	
		14800	✓	✓	✓	
		15000	✓	✓	✓	
SP-23	HOSPITAL	13250	✓	✓	✓	
SP-27	TRUCK LANE	1250	✓	✓	✓	
		1750	✓	✓	✓	
SP-28	TOLL PLAZA	19300	✓	✓	✓	
		20000	✓	✓	✓	
ENVIRONMENTAL SIGNAGE						
SP-40	ENVIRONMENTAL SIGNAGE	26380	✓	✓	✓	
		26480	✓	✓	✓	
		28787	✓	✓	✓	
		28887	✓	✓	✓	
		30104	✓	✓	✓	
		30204	✓	✓	✓	
		31650	✓	✓	✓	
		31750	✓	✓	✓	
		35775	✓	✓	✓	
		35875	✓	✓	✓	
		40924	✓	✓	✓	
		41024	✓	✓	✓	
		45152	✓	✓	✓	
		45252	✓	✓	✓	
SP-49	ENVIRONMENTAL SIGNAGE	26400	✓	✓	✓	
		26460	✓	✓	✓	
		28807	✓	✓	✓	
		28867	✓	✓	✓	
		30124	✓	✓	✓	
		30184	✓	✓	✓	
		31670	✓	✓	✓	
		31730	✓	✓	✓	
		35795	✓	✓	✓	
		36855	✓	✓	✓	
		40844	✓	✓	✓	
		41004	✓	✓	✓	
		45172	✓	✓	✓	
		45232	✓	✓	✓	
SIGNAGE AT NH JN						
SP-1	STOP Sign	0	✓	✓	✓	
SP-2	Compulsory Keep Left	50	✓	✓	✓	
SP-3	Give Way	0	✓	✓	✓	
SP-13(G)	Major Road Ahead	50	✓	✓	✓	
SP-15(G)	Dual Carriageway Begins	75	✓	✓	✓	
SP-15(G)	Dual Carriageway Ends	150	✓	✓	✓	

**PROJECT:-**  
**SCHEDULE OF SIGN POSTS**  
 BHADRAK TO CHANDBALI-BALANCE WORK (SH-9, KM 0/00 TO 45/00)

DESIGNED BY: DRAWN BY: REV:1 APPROVED

DATE: 18.01.13 REV: R1

SCALE: NTS

CEG CEG EE,PMU CE,WBP

**CONSULTING ENGINEER, WBPROUP LTD**  
 E-12, Meji Colony, Malviya Nagar, Jaipur-17  
 Tel: +91-141-2520899, 2521899, 2520556  
 Fax: 2521348, e-mail: ceg@ceginfolia.com

**CEG**



SCHEDULE OF PEDESTRIAN CROSSING

SCHEDULE OF PEDESTRIAN CROSSING		BUS BAYS
CHAINAGE	HOSPITAL ZONE	
13270		1078
6460		9842
12830		11442
16900		17958
25260		20242
26300		24292
26308		26642
		39542
		41942
		44542
		48942
		49718

NOTE:-

- FOR DETAILS OF PEDESTRIAN CROSSING REFER ROAD MARKINGS
- FOR DETAILS OF RPIs AT PEDESTRIAN CROSSING REFER STANDARD DRAWINGS

SCHEDULE OF GUARD POSTS

CHAINAGE	TO	LENGTH	SIDE	REMARKS
4213	4233	20	BOTH	BRIDGE APPROACH
4243	4263	20	BOTH	.06..
3834	3854	20	BOTH	.06..
3864	3884	20	BOTH	.06..
6064	6084	20	BOTH	.06..
6094	6114	20	BOTH	.06..
28812	28832	20	BOTH	.06..
28842	28862	20	BOTH	.06..
34975	34995	20	BOTH	.06..
35005	35025	20	BOTH	.06..
35025	35085	60	BOTH	HIGH EMBANKMENT
35085	35275	180	BOTH	.06..
35285	35328	43	BOTH	.06..
35352	35413	61	BOTH	.06..
35437	35498	61	BOTH	.06..
35522	35588	66	BOTH	.06..
35612	35668	56	BOTH	.06..
35682	35820	128	BOTH	.06..
35830	35888	58	BOTH	.06..
37959	37979	20	BOTH	BRIDGE APPROACH
38021	38041	20	BOTH	BRIDGE APPROACH
For Connecting Road Between SH-9 and NH - 5				
400	450	50	BOTH	BRIDGE APPROACH
500	550	50	BOTH	BRIDGE APPROACH

NOTE:

- GUARD POSTS SHALL BE PROVIDED AS PER THE DRAWING NO OSRP/CEG/KM & GP
- GUARD POSTS SHALL BE PROVIDED AT ALL THE SECTIONS  
BRIDGE LOCATIONS AS PER DRAWING NO OSRP/CEG/TR

SCHEDULE OF EXTRA WIDENING

SL NO	CURVE START	CURVE END	RADIUS	CURVE LENGTH	TRANSITION	EXTRA WIDENING
1	2+981.056	3+099.208	300	935.048	75	0.6 M
2	5+704.254	5+737.754	155	296.465	70	0.6 M
3	6+462.920	6+530.241	155	271.01	70	0.6 M
4	8+922.135	8+986.401	240	392.782	90	0.6 M
5	9+915.435	10+056.917	200	416.008	60	0.6 M
6	11+564.245	11+677.166	240	120.451	90	0.6 M
7	36+131.547	36+309.543	300	832.841	75	0.6 M
8	42+049.777	42+123.527	300	134.52	75	0.6 M
9	42+351.098	42+407.581	300	77.571	75	0.6 M

NOTE:

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

PROJECT:-

ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE.

**CONSULTING ENGINEER, WB GROUP LTD.**  
E-12, Moj Colony, Malviya Nagar Jaipur-17

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SCHEDULE OF GUARD POSTS, PEDESTRIAN -  
CROSSING & EXTRA WIDENING  
BHADRAK TO CHANDBALI-BALANCE WORK (SH-9, KM 0/00 TO 45/00)

DRG NO. OSRP/CEG/SH-9/SCH/OP-WP-PC	DESIGNED BY	REV.1	APPROVED
SH. NO. 52	DATE 18.01.13	REV. 1	
SCALE	NTS		
	CEG	CEG	EE, PMU CE, WBP

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



DETAILED PAVEMENT SCHEDULE FOR BHADRAK TO CHANDBALI(SH-09)

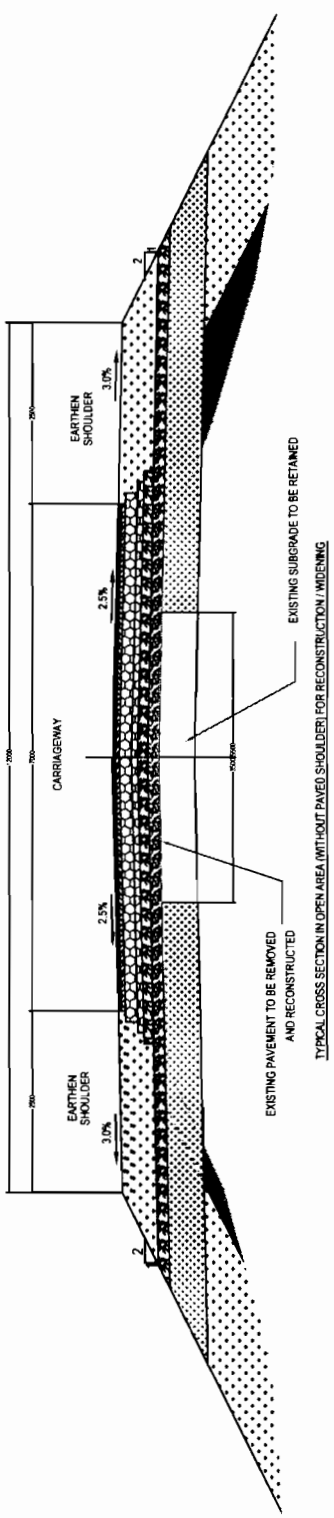
Sl. No	Chalange		Distance in Mts	Type of Construct	Type of Area	TCS
	From	To				
1	0	1015	1015	new Construct	Built	TCS-33
2	1015	2000	985	new Construct	Open	TCS-33With Treated material (R - 500 mm)
3	2000	4050	2050	new Construct	Open	TCS-18
4	4050	5600	1550	Reconstruction	Open	TCS-02
5	5600	5850	250	Reconstruction	Built	TCS-36
6	5850	6300	450	Reconstruction	Open	TCS-02
7	6300	6650	350	Reconstruction	Built	TCS-36
8	6650	9000	2350	Reconstruction	Open	TCS-02
9	9000	9600	600	new Construct	Open	TCS-18
10	9600	10250	650	Rigid pavement	Built	TCS-32
12	10250	11500	1250	new Construct	Open	TCS-18
13	11500	12900	1400	new Construct	Built	TCS-33
14	12900	14000	1100	new Construct	Open	TCS-18
15	14000	14300	300	new Construct	Built	TCS-33
16	14300	16100	1800	new Construct	Open	TCS-18
17	16100	18500	2400	Rigid pavement	Built	TCS-32
18	18500	19000	500	new Construct	Open	TCS-02
19	19000	19200	200	Rigid pavement	Built	TCS-32
20	19200	20100	900	new Construct	Open	TCS-02
21	20100	20200	100	Rigid pavement	Built	TCS-32
22	20200	21200	1000	new Construct	Open	TCS-02
23	21200	21600	400	Rigid pavement	Built	TCS-32
24	21600	24450	2850	new Construct	Open	TCS-18
25	24450	24600	150	new Construct	Built	TCS-33
26	24600	25800	1200	new Construct	Open	TCS-18
27	25800	27100	1300	Rigid pavement	Built	TCS-32
28	27100	30300	3200	new Construct	Open	TCS-18
29	30300	30500	200	new Construct	Built	TCS-33
30	30500	31000	500	new Construct	Open	TCS-18
31	31000	32900	1900	new Construct	Open	TCS-03
32	32900	33200	300	new Construct	Built	TCS-32
34	33200	37100	3900	new Construct	Open	TCS-18
35	37100	37900	800	new Construct	Built	TCS-32
36	37900	38100	200	new Construct	Open	TCS-18
37	38100	40300	2200	Rigid pavement	Built	TCS-32
38	40300	41750	1450	new Construct	Open	TCS-03
39	41750	42000	250	new Construct	Built	TCS-39
40	42000	42500	500	new Construct	Open	TCS-03
41	42500	44600	2100	Reconstruction	Open	TCS-02
42	44600	44950	350	Rigid pavement	Built	TCS-35
43	0	910	910	new Construct	Open	TCS-03

FOR CONNECTING ROAD BETWEEN SH-09 AND NH-5

SCHEDULE OF PAVEMENT COMPOSITION

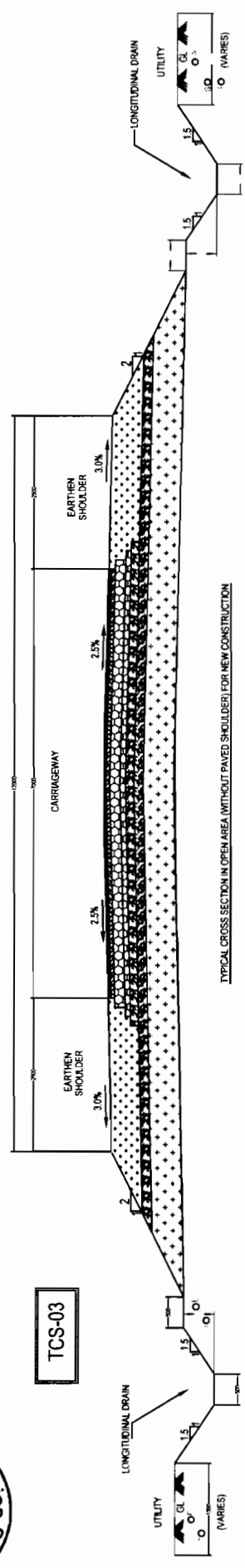
DRG NO	DATE	REV	REV	REV
SH-09	17/01/2013			
SCALE				
PROJECT		PROJECT		
ORISSA STATE ROAD PROJECT		ORISSA STATE ROAD PROJECT		
PROJECT		PROJECT		
REVISED BY	DATE	REVISED BY	DATE	REVISED BY
APPROVED	DATE	APPROVED	DATE	APPROVED

TCS-02



Corsan Corviam Construccion S.A.  
Contractor

TCS-03



Volume-IV:Page 64 of 298

LEGENDS

- 1) BC
- 2) DBM
- 3) WMM
- 4) GSB
- 5) SUBGRADE
- 6) DLC
- 7) PCC
- 8) EARTH FILL
- 9) SAND FILL
- 10) E - Electricity Cable
- 11) T - Telecom Cable
- 12) W - Water Supply Line
- 13) G - Gas Line
- 14) S - Sewer

PROJECT:-

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK

TYPICAL CROSS-SECTION

TCS - 02 & TCS - 03

(BHADRAK-CHANDBALI SH-09 KM0/0 TO KM.45/0)

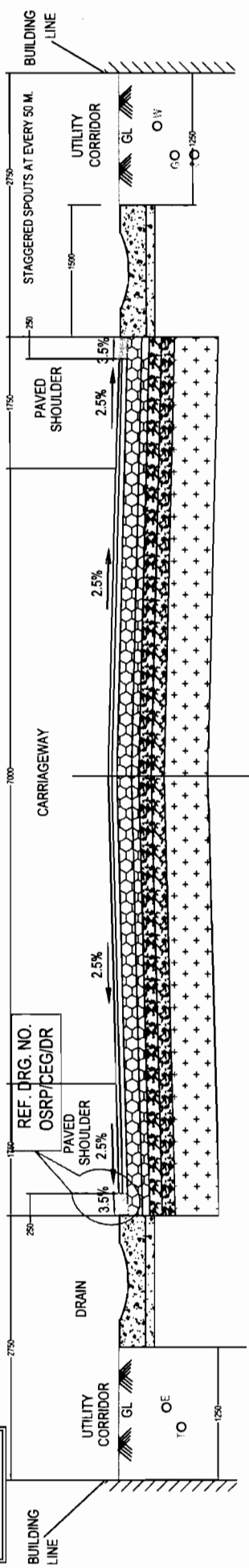
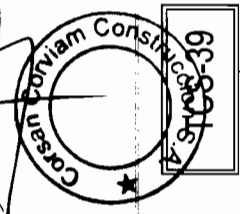
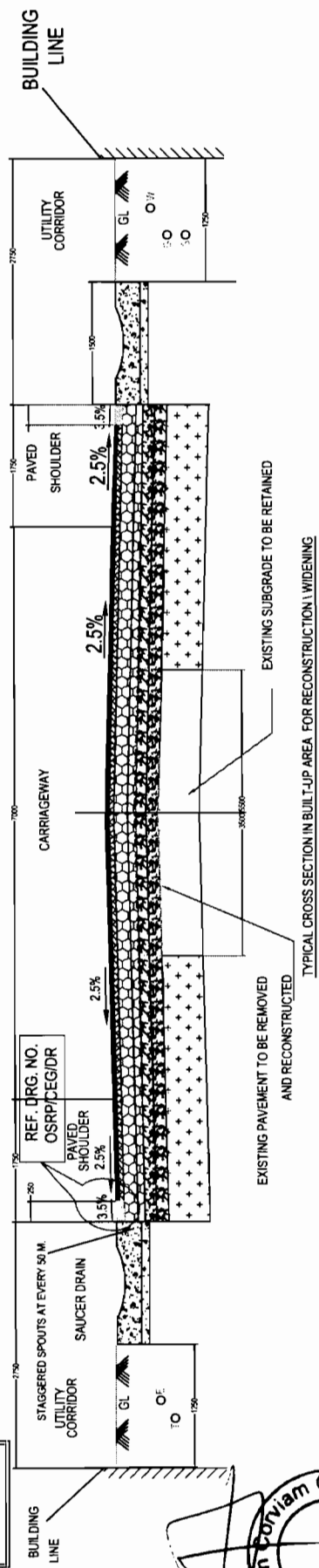
DRG NO.	OSR/CEG/CS/SH/09	DESIGNED BY	CEG	DRAWN BY	CEG	REV. NO.	REV. 1	APPROVED	CE.WBP
SH. NO.	01	DATE	18/01/13	REV	R-1	EE/PMU			
SCALE	NTS								

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

**TCS-38**



TYPICAL CROSS SECTION IN BUILT-UP AREA FOR NEW CONSTRUCTION

**LEGENDS**

1) BC	6) D/C	11) W - Water Supply Line
2) DBM	7) PCC	12) G - Gas Line
3) W/M	8) EARTH FILL	13) S - Sewer
4) CSB	9) SAND FILL	10) E - Electricity Cable
5) SUBGRADE	10) E - Electricity Cable	11) T - Telecom Cable

**TYPICAL CROSS-SECTION**  
TCS - 38 & TCS - 39  
**(BHADRAK-CHANDBALI-BALANCE WORK)**

DRG NO.	OSRP/CEG/DR	DESIGNED BY	CEG	CEG	CEG	REV	R-1	REV	CEG	CEG	CEG	REV	REV	REV	REV	REV	REV	REV	REV	REV
SH. NO.	03	DATE	18/01/13	REV	R-1	REV	R-1	REV	CEG	CEG	CEG	REV	REV	REV	REV	REV	REV	REV	REV	REV
SCALE																				

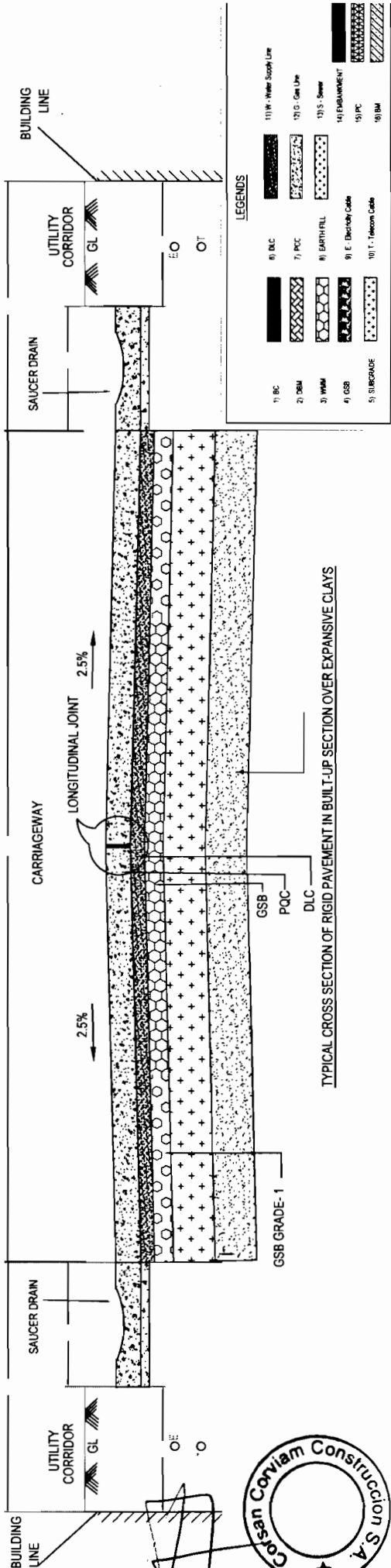
**PROJECT:-**  
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK

**CONSULTING ENGINEERS GROUP LTD.**  
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**CEG**



TCS-32

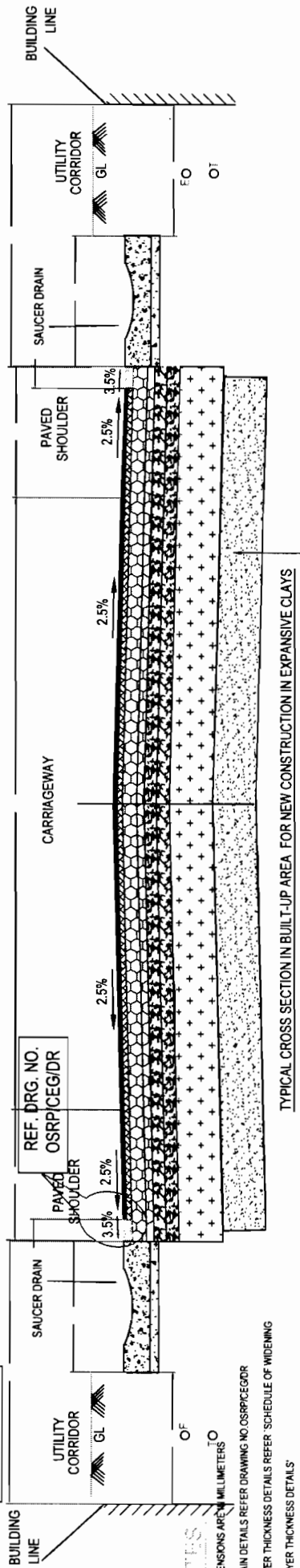


TYPICAL CROSS SECTION OF RIGID PAVEMENT IN BUILT-UP SECTION OVER EXPANSIVE CLAYS

**LEGENDS**

1) BC	6) B.C	11) W - Water Stop Layer
2) DBM	7) PCC	12) C - Con. Lr
3) WBM	8) EARTH FILL	13) S - Sewer
4) GSB	9) E - Earthfill	14) PAVEMENT
5) SUBGRADE	10) T - Telecom Cable	15) BM

TCS-33



TYPICAL CROSS SECTION IN BUILT-UP AREA FOR NEW CONSTRUCTION IN EXPANSIVE CLAYS

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS
2. FOR DRAIN DETAILS REFER DRAWING NO. OSRP/CEG/DR AND LAYER THICKNESS DETAILS
3. FOR LAYER THICKNESS DETAILS REFER SCHEDULE OF WIDENING
4. THE CROSS SECTIONS SHALL BE READ WITH DETAILS OF TRANSITION BETWEEN RIGID AND FLEXIBLE REFER DRAWING NO. OSRP/CEG/RIGID/02
5. FOR PAVEMENT EDGE DETAILS REFER DRAWING NO. OSRP/CEG/00
6. PCC-PROFILE CORRECTIVE COURSE WITH THE MATERIAL SAME AS THAT OF OVERLAYING LAYER ABOVE IT.
7. INCREASE THE UTILITIES/TREES OBSTRUCTING THE LONGITUDINAL DRAINS. THE DRAINS MAY BE DIVERTED AS PER ENGINEERS DIRECTIONS

**PROJECT:-**

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK

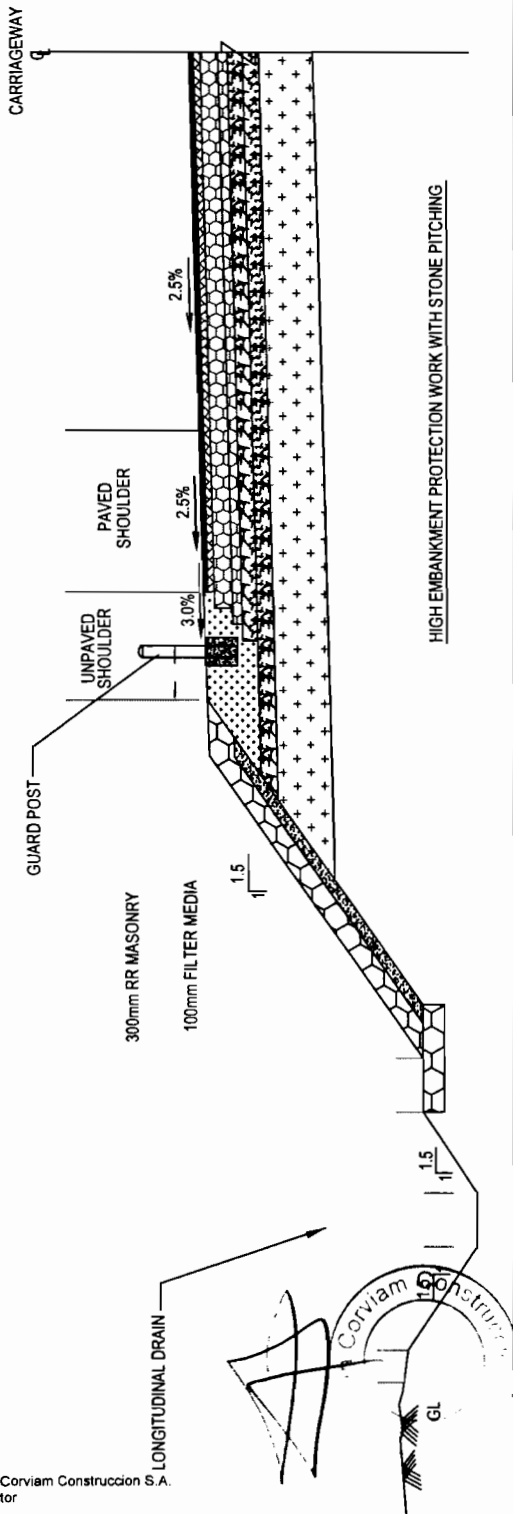
**TYPICAL CROSS-SECTION**

TCS - 32 & 33

(BHADRAK-CHANDBALI-BALANCE WORK)

DRG. NO.	OSRP/CEG/CS/02/33	REV.1	APPROVED
SH. NO.	05	DATE	18/01/13
SCALE		REV	R-1
		NTS	
		EE,PMU	CE,WBP

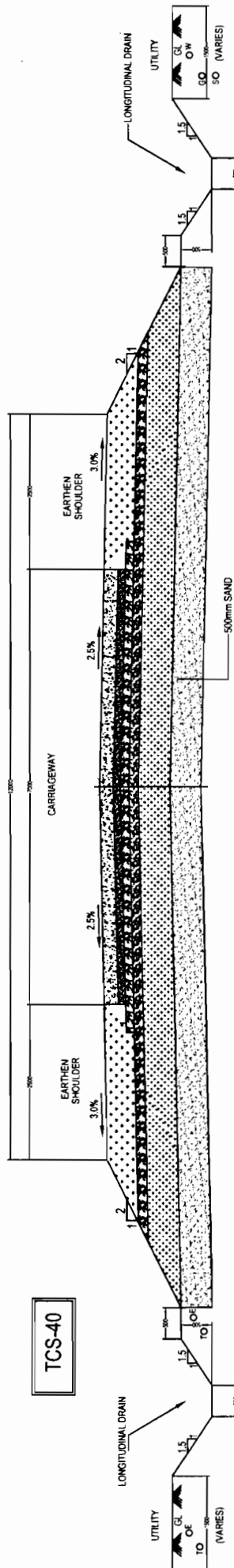
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Fax: 2521348, e-mail: ceg@cegindia.com



SCHEDULE

Sl. No.	Chainage From	Chainage To	Length	Sides
1	5+850	6+200	350	RHS
2	34+800	37+000	600	BOTH

HIGH EMBANKMENT PROTECTION WORK WITH STONE PITCHING



TYPICAL CROSS SECTION IN OPEN AREA (WITHOUT PAVED SHOULDER) FOR NEW CONSTRUCTION (RIGID PAVEMENT) IN EXPANSIVE CLAYS

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

PROJECT:-

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK

STANDARD DRAWINGS PROTECTION WORK &  
TCS-40  
(BHADRAK-CHANDBALI-BALANCE WORK)

DRG NO.	CSBREC/PM	DESIGNED BY	CEG	CEG	REV R-1	REV R-1	APPROVED
SH. NO.	11	DATE	18/01/13	CEG	CEG	EE/PMU	CE/WBP
SCALE	NTS						

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Fax: 2521348, e-mail: ceg@cegindia.com

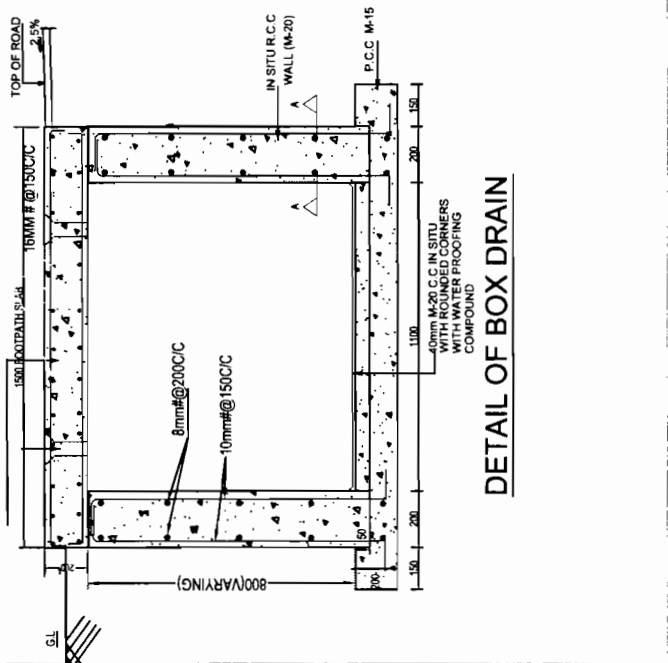
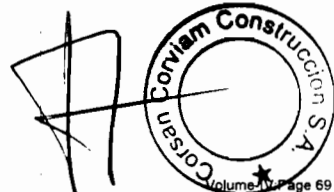




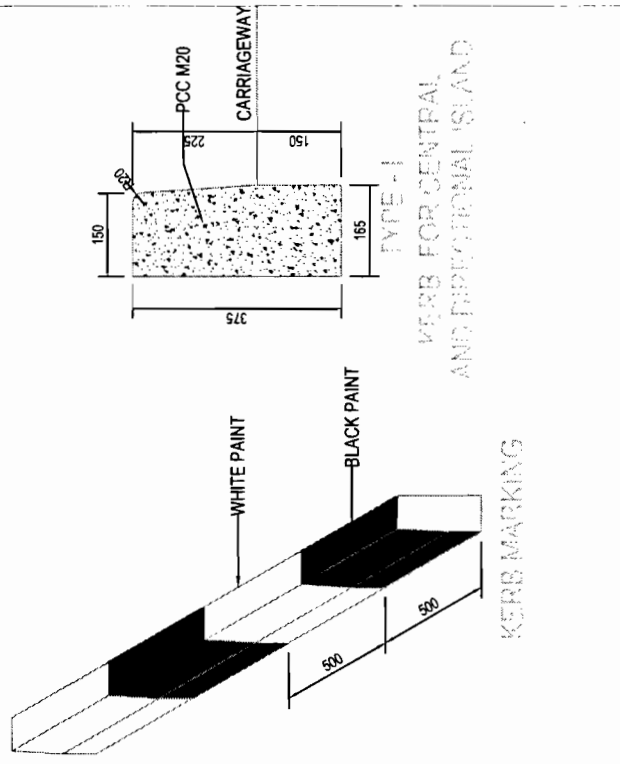
CHAINAGE FROM O	LENGTH	SIDE
560	1200	BOTH
580	280	BOTH
630	6650	BOTH
9600	10250	BOTH
11500	12900	BOTH
14000	4330	BOTH
16100	18500	BOTH
21200	21800	BOTH
24000	400	BOTH
25800	27100	BOTH
30300	30500	BOTH
32900	33200	BOTH
37100	37400	BOTH
39100	40300	BOTH
44600	45000	BOTH

Corsan Corviam Construccion S.A.  
Contractor

- FOR DETAILS OF LINED DRAINS REFER DWG NO. OSR/PC/EG/DR
- THE PROVISION AND LENGTH OF THE LINED DRAIN SHALL BE RE-ASSESSED DURING THE TIME OF CONSTRUCTION.
- FOOTPATH BARRIERS SHALL BE PROVIDED AS PER DWG. NO OSR/PC/EG/PH
- FOR BARRIAGES OPENING SHALL BE PROVIDED
- LINED DRAIN SCHEDULE SUPERSEDES THE PLAN
- ALL REINFORCEMENTS SHALL BE CONFIRMED TO FE-500

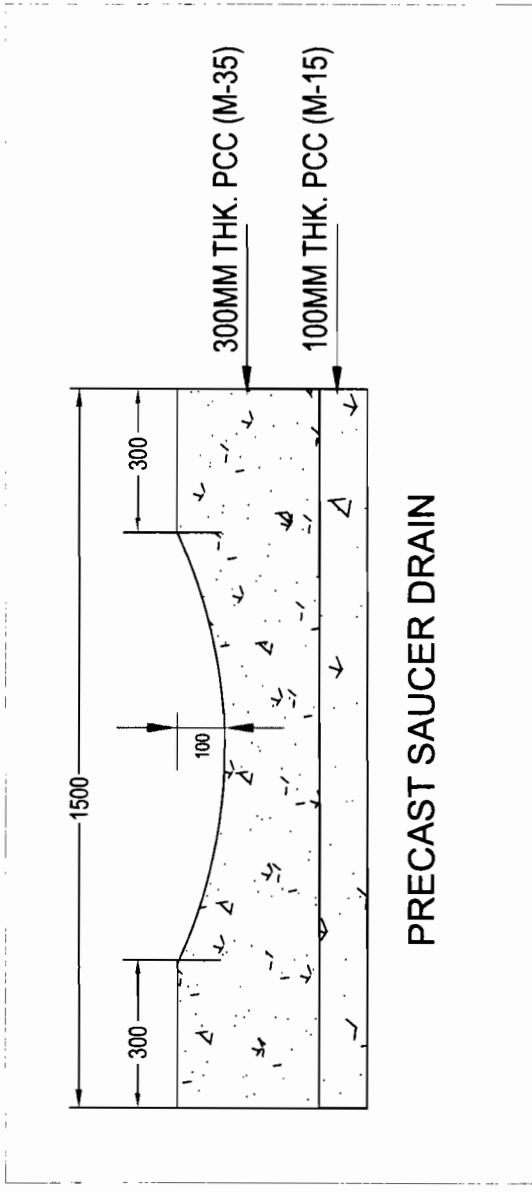


DETAIL OF BOX DRAIN



TYPE-I  
KERB FOR CENTRAL  
AND DIRECTIONAL ISLAND

KERB MARKING



PRECAST SAUCER DRAIN

PROJECT:-

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK

**CONSULTING ENGINEERS GROUP LTD.**  
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World Bank Project Engineer,  
World Bank Project Engineer,  
O/o the E.I.C. (Civil), Odisha  
Bhubaneswar.

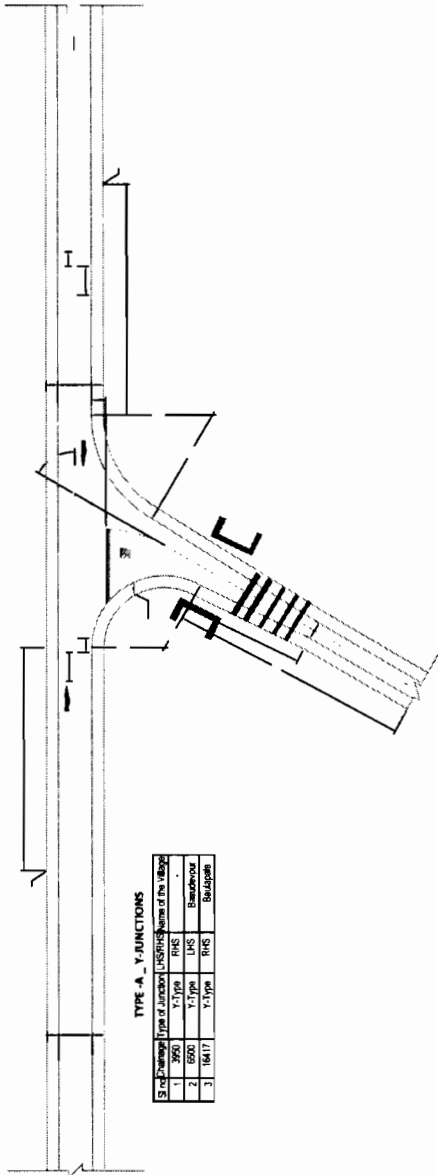
STANDARD DRAWINGS DETAILS OF DRAIN AND KERB (BHADRAK-CHANDBALI-BALANCE WORK)			
DRG NO.	OSR/PC/EG/DR	DESIGNED BY	CEG
SH. NO.	16	DATE	18/01/13
SCALE		REV	R-1
		CEG	EE, PMU
		CEG	CE, WBP

STANDARD DRAWINGS DETAILS OF DRAIN AND KERB (BHADRAK-CHANDBALI-BALANCE WORK)	
DESIGNED BY	CEG
DATE	18/01/13
REV	R-1
SCALE	NTS



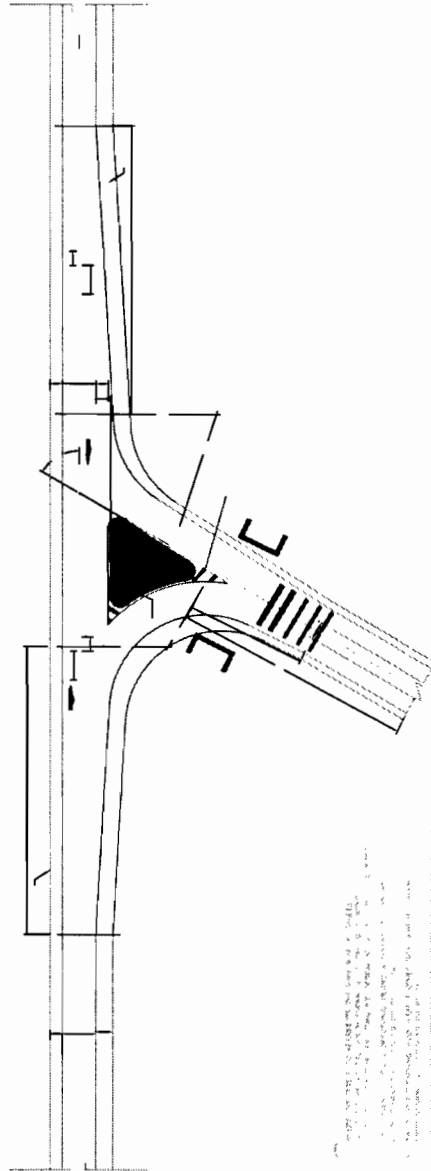




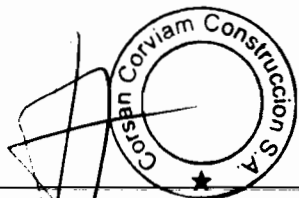


TYPE - A - Y-JUNCTIONS

Sl. No.	Type of Junction	Radius (m)	Remarks
1	Y-Type	RHS	Standard
2	Y-Type	LHS	Standard
3	Y-Type	RHS	Standard



1. The junction shall be provided with a central island of 10m width. The island shall be provided with a 100mm thick concrete surface. The island shall be provided with a 100mm thick concrete surface. The island shall be provided with a 100mm thick concrete surface.



STANDARD DRAWINGS  
TYPICAL Y-JUNCTION WITH  
SINGLE LANE BT ROAD/EARTHEN ROAD  
(BHADRAK-CHANDBALI-BALANCE WORK)

DRG NO.	OSR/PC/CA/003	DESIGNED BY	CEG	CHECKED BY	CEG	DATE	18/07/13	REV	R-1	APPROVED	CE.WBP
SH. NO.	20	DATE	18/07/13	REV	R-1	SCALE	NTS		PREPARED BY	EE.PMU	

PROJECT:-

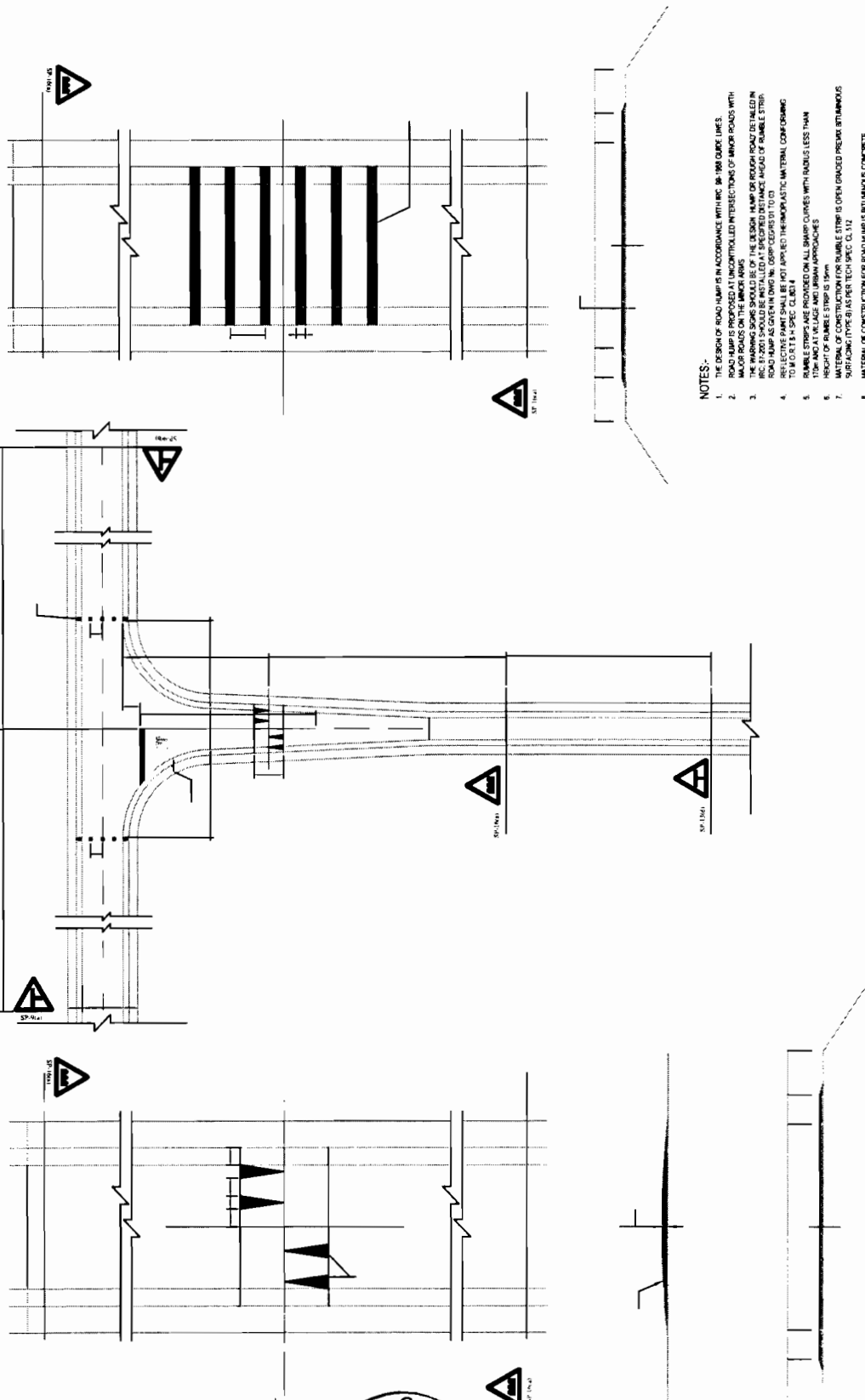
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK

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Chief Engineer  
World Bank Project  
O/o the Chief Engineer  
Bhubaneswar  
Employer



- NOTES:-**
1. THE DESIGN OF ROAD HUMPS IN ACCORDANCE WITH IRC 81-1980 CURVE LINES.
  2. ROAD HUMPS SHALL BE CONTROLLED INTERSECTIONS OF ROAD ROADS WITH MAJOR ROADS ON THE MAJOR ROAD.
  3. THE WARNING SIGNS SHOULD BE OF THE DESIGN HUMP OR ROAD HUMP DETAILED IN IRC 81-2003 SHOULD BE INSTALLED AT SPECIFIED DISTANCE AHEAD OF RUMBLE STRIP.
  4. ROAD HUMPS SHALL BE INSTALLED AT SPECIFIED DISTANCE TO THE RUMBLE STRIP. THE DISTANCE SHALL NOT BE LESS THAN 100 METERS.
  5. RUMBLE STRIPS ARE PROVIDED ON ALL SHARP CURVES WITH RADIUS LESS THAN 100 METERS AT VILLAGE AND URBAN APPROACHES.
  6. HEIGHT OF RUMBLE STRIP IS 15mm.
  7. SPACING BETWEEN RUMBLE STRIPS IS OPEN GRADED PRECAST BITUMINOUS SURFACING TYPE (B) AS PER TECH SPEC. CL.112.
  8. MATERIAL OF CONSTRUCTION FOR ROAD HUMP IS BITUMINOUS CONCRETE AS PER TECH SPEC. CL.59.
  9. REFLECTIVE PAVEMENT MARKERS ARE PROVIDED AS SHOWN IN DRAWING NO. OSRHS/CG/RS BEFORE AND AFTER RUMBLE STRIP/ROAD HUMP.

**SCHEDULE AT DRG. NO. ORP/CEG/SH-16/SCH.\_RH & RS**

STANDARD DRAWINGS  
DETAILS OF ROAD HUMP AND RUMBLE STRIPS

(BHADRAK-CHANDBALI-BALANCE WORK)

DRG NO.	OSRHS/CG/RS	DESIGNED BY	CEG	DRAWN BY	CEG	REV. RT	EE, PMU	APPROVED	CE, WBP
SH. NO.	22	DATE	18/01/13	REV	R-1				
SCALE	NTS								

**PROJECT:-**  
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK

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**CEG**



SCHEDULE OF RUMBLE STRIP

SL NO	CURVE START	CURVE END	RADIUS	CURVE LENGTH	TRANSITION	TOTAL NOS
1	5704.254	5737.754	155	296.465	70	145
2	6462.92	6530.241	155	271.01	70	137

SCHEDULE OF ROAD HUMPS

SL NO	CHAINAGE	TYPE OF JUNCTION	LHS/RHS	SL NO	CHAINAGE	REMARKS
1	3950	Y-Type	RHS	1	480	SCHOOL ZONE
2	6500	Y-Type	LHS	2	510	SCHOOL ZONE
3	12235	T-Type	LHS	3	16800	SCHOOL ZONE
4	16417	Y-Type	RHS	4	16900	SCHOOL ZONE
5	17668	T-Type	RHS	5	25200	SCHOOL ZONE
6	18425	T-Type	RHS	6	25260	SCHOOL ZONE
7	19376	T-Type	RHS	7	27770	SCHOOL ZONE
8	21420	T-Type	LHS	8	27830	SCHOOL ZONE
9	21990	T-Type	LHS	9	36175	SCHOOL ZONE
10	23252	T-Type	LHS	10	36260	SCHOOL ZONE
11	24600	Cross Jun	Both	11	47770	SCHOOL ZONE
12	33126	T-Type	RHS	12	47900	SCHOOL ZONE
13	36195	T-Type	RHS	13	13270	HOSPITAL ZONE
14	37255	T-Type	LHS	14	13330	HOSPITAL ZONE
15	40000	T-Type	RHS			

NOTE:

1. JUNCTION SHALL BE IMPROVED AS PER THE DRAWING NO OSRP/CEG/JN/01 TO 03
2. ALL OTHER JUNCTIONS WITH WBM CROSS ROAD, CEMENT, EARTHEN SHALL BE IMPROVED AS PER THE STANDARD DRAWINGS
3. PROPOER SIGNAGE SHALL BE PROVIDED FOR THE SAFETY OF THE TRAFFIC MOVEMENT AT THESE JUNCTIONS

SCHEDULE OF ROAD DELINEATORS AT CURVES UPTO 300m

START	END	RADIUS		ARC LENGTH
		START	END	
2+981.056	3+099.208	300		935.048
5+704.254	5+737.754	155		296.465
6+462.920	6+530.241	155		271.01
8+922.135	8+986.401	240		392.782
9+915.435	10+056.917	200		416.008
11+564.245	11+677.166	240		120.451
30+490.993	30+642.449	350		235.815
36+131.547	36+309.543	300		832.841
42+049.777	42+123.527	300		134.52
42+351.098	42+407.581	300		77.571

BUILTUP AREA

CHAINAGE FROM	CHAINAGE TO	LENGTH
0	1200	1200
5600	5880	280
6300	6650	350
9600	10250	650
11500	12900	1400
14000	14300	300
16100	18500	2400
21200	21600	400
24450	24800	350
25800	27100	1300
30300	30500	200
32900	33200	300
37100	37400	300
39100	40300	1200
44600	45000	400



CLASS-B, GI 40 MM DIA PIPE

GI 30 MM DIA PIPE

BASE PLATE 150MM

150

75

ELEVATION OF FOOTPATH BARRIER

FOOTPATH BARRICADES		LENGTH
CHAINAGE FROM	TO	
0	1200	1200
5600	5880	280
6300	6650	350
9600	10250	650
11500	12900	1400
14000	14300	300
16100	18500	2400
21200	21600	400
24450	24800	350
25600	27100	1300
30300	30500	200
32900	33200	300
37100	37400	300
39100	40300	1200
44600	45000	400

NOTE: Leave openings for entrances to properties and spur roads

PROJECT:-

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK

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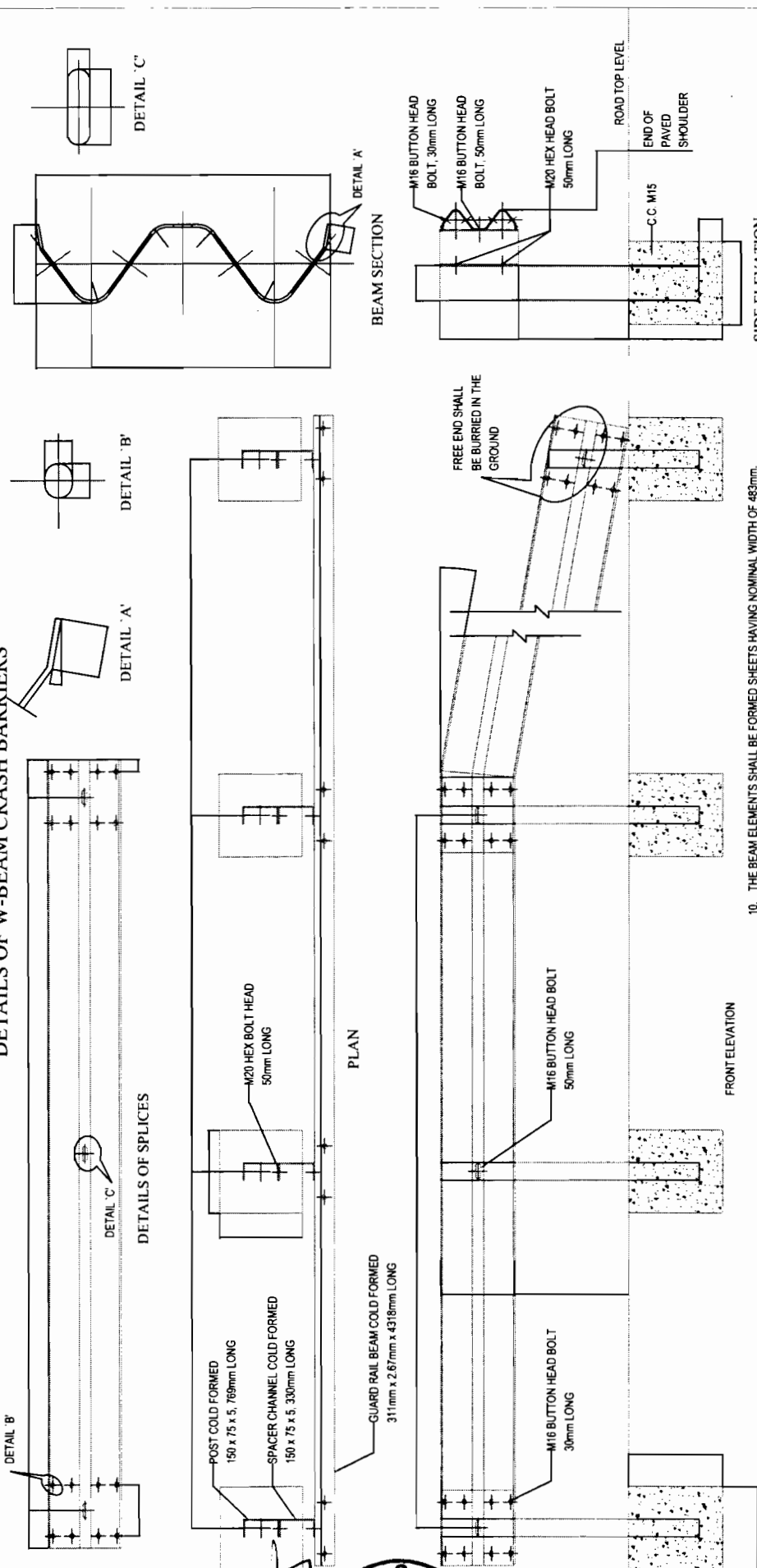


Chief Engineer  
World Bank Projects, Odisha  
O/o the E.I.C. (Civil), Odisha  
Bhubaneswar

STANDARD DRAWINGS  
DETAILS OF FOOTPATH BARRIERS  
(BHADRAK-CHANDBALI-BALANCE WORK)

DRG NO.	DATE	REV	DESIGNED BY	DRAWN BY	REV. BY	APPROVED
SH. NO.	23	18/01/13	R-1	CEG	CEG	CE.WBP
SCALE	NTS					

DETAILS OF W-BEAM CRASH BARRIERS



- HEIGHT OF POSTS SHOULD BE 785mm LONG ABOVE THE FINISHED ROAD LEVEL.
  - SPACING OF POSTS SHOULD BE 2.0m C/C.
  - 1 No. SPACER CHANNEL SHOULD BE PLACED AT EACH POST.
  - W PROFILE FORMED CORRUGATED BEAMS EFFECTIVE LENGTH OF 4318mm, 311mm x 83mm.
  - POST CONSISTS OF FORMED CHANNEL OF SIZE 150 x 75 x 5, 785mm LONG ABOVE GROUND LVL.
  - SPACER CONSISTS OF FORMED CHANNEL OF SIZE 150 x 75 x 5, 330mm LONG.
  - BUTTON HEAD BOLTS M16 x 30mm LONG, 8 Nos FOR THE SPICING OF THE W BEAM TO SPACER.
  - BUTTON HEAD BOLTS M16 x 50mm LONG, 1 Nos AT THE CONNECTION OF THE W BEAM TO SPACER.
  - HEX HEAD BOLTS M20 x 50mm LONG, 2 Nos AT THE CONNECTION OF THE SPACER TO POST.
10. THE BEAM ELEMENTS SHALL BE FORMED SHEETS HAVING NOMINAL WIDTH OF 483mm.
11. THE BASE MATERIAL OF THE CORRUGATED BEAM SHALL COMPLY TO FOLLOWING MECHANICAL PROPERTIES:-
- TENSILE STRENGTH, MIN=483 MPA.
  - ELONGATION, IN 2 INCHES, MIN = 12%.
  - YIELD, MIN=345 MPA.
12. ALL MEMBERS OF THE SYSTEM SHOULD BE HOT DIPPED GALVANIZED AND TO HAVE A MINIMUM COATING OF 500g/Sq m. EACH FACE IN CONFORMANCE TO M.O.R.T & H. SPECIFICATIONS (CLAUSE B10).
13. BEAMS TO BE ERECTED ON A RADIUS OF 46m (150') OR LESS SHALL BE SHAPE CURVED TO APPROPRIATE CURVATURE.
14. CRASH BARRIERS ARE POSTED ON ALL SECTION OF EMBANKMENT WHOSE HEIGHT IS >= TO 3m. HORIZONTAL CURVES OF RADIUS < 100m AND ALSO AT ALL BRIDGE APPROACHES FOR LENGTH OF 20m ON BOTH SIDES.
15. BEAM SURFACE FACING THE TRAFFIC IS PAINTED WITH ALTERNATE BANDS (500mm WIDE) OF BLACK & YELLOW COLOR REFLECTOR PAINT CONFORMING C.I. 803.5 OF M.O.R.T & H SPEC.

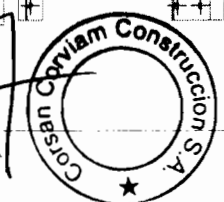
SCHEDULE:  
 AT 1 MAJOR BRIDGES : 100M AT 2 SIDES ON BOTH WAYS  
 AT 6 MINOR BRIDGES : 50M AT 2 SIDES ON BOTH WAYS

PROJECT:-  
 ODISHA STATE ROAD PROJECT  
 UNDER WORLD BANK

**CONSULTING ENGINEERS GROUP LTD.**  
 E-12, Moji Colony, Malviya Nagar Jaipur-17  
 Tel: +91-141-2520899, 2521899, 2520556  
 Fax: 2521348, e-mail: ceg@cegindia.com

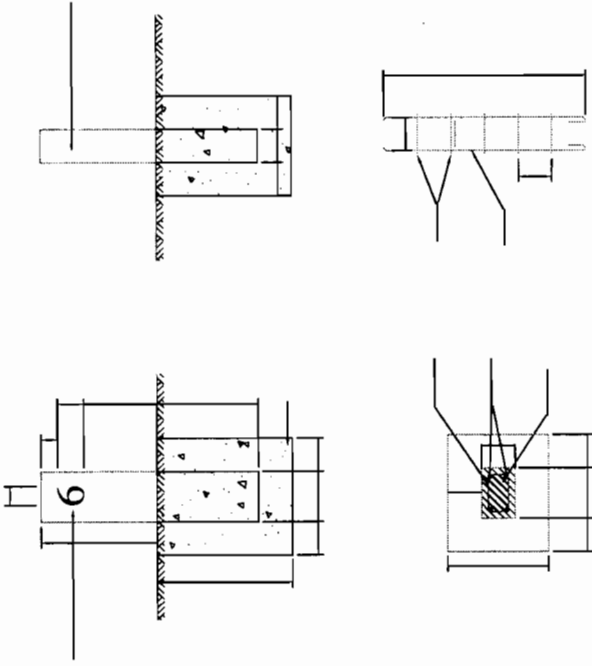
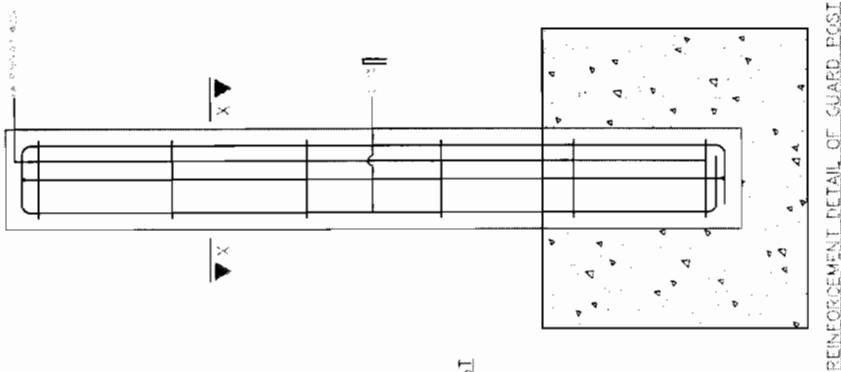
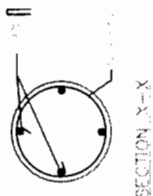
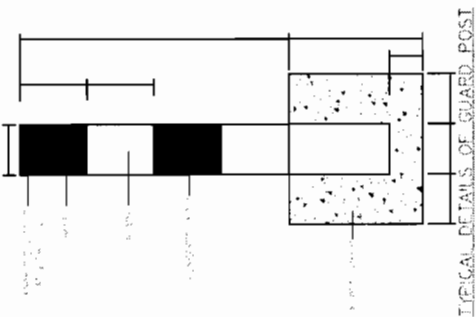
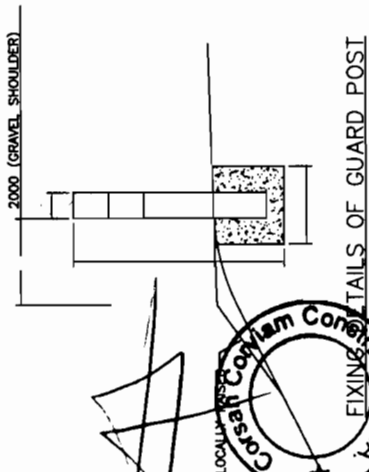
STANDARD DRAWINGS  
 METAL BEAM CRASH BARRIER DETAILS  
 (BHADRAK-CHANDBALI-BALANCE WORK)

DRG NO.	DATE	REV	REV/RT	APPROVED
SH. NO.	24	18/01/13	R-1	CE, WBP
SCALE	NTS		DESIGNED BY	CEG
			DRAWN BY	EE, PMU



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





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.

3. FOR SCHEDULE REFER DRAWING NO. OSRP/CEG/SH9A&SH-9/SCH-GP

PROJECT:-

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK

**CONSULTING ENGINEERS GROUP LTD.**  
E-12, M6ji Colony, Malviya Nagar Jaipur-17  
Tel: +91-141-2520899, 2521899, 2520556  
Fax: 2521348; e-mail: ceg@cegroupindia.com



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

STANDARD DRAWINGS  
TYPICAL DETAILS OF 200M STONE & GUARD POST  
(BHADRAK-CHANDBALI-BALANCE WORK)

DRG NO.	OSRP/CEG/SH9A & GP	DESIGNED BY	CEG	DRAWN BY	CEG	REV. R1	APPROVED	CE, WRP
SH. NO.	76	DATE	18/07/13	REV	R-1	CEG	EE, PMU	CE, WRP
SCALE	NTS							





SCHEDULE OF RUMBLE STRIP

SL NO	CURVE START	CURVE END	RADIUS	CURVE LENGTH	TRANSITION	TOTAL NOS
1	5704.254	5737.754	155	296.465	70	145
2	6462.92	6530.241	155	271.01	70	137

SCHEDULE OF ROAD DELINEATORS AT CURVES UPTO 300m

START	END	RADIUS	ARC	
			ARC LENGTH	AREA
2+981.056	3+099.208	300		935.048
5+704.254	5+737.754	155		296.465
6+462.920	6+530.241	155		271.01
8+922.135	8+986.401	240		392.782
9+915.435	10+056.917	200		416.008
11+564.245	11+677.166	240		120.451
30+490.993	30+642.449	350		235.815
36+131.547	36+309.543	300		832.841
42+049.777	42+123.527	300		134.52
42+351.098	42+407.581	300		77.571

SCHEDULE OF ROAD HUMPS

SL NO	CHAINAGE	REMARKS
1	480	SCHOOL ZONE
2	510	SCHOOL ZONE
3	16800	SCHOOL ZONE
4	16900	SCHOOL ZONE
5	25200	SCHOOL ZONE
6	25260	SCHOOL ZONE
7	27770	SCHOOL ZONE
8	27830	SCHOOL ZONE
9	36175	SCHOOL ZONE
10	36260	SCHOOL ZONE
11	47770	SCHOOL ZONE
12	47900	SCHOOL ZONE
13	13270	HOSPITAL ZONE
14	13330	HOSPITAL ZONE

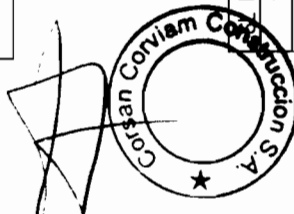
SL NO	CHAINAGE	TYPE OF JUNCTION	LHS/RHS
1	3950	Y-Type	RHS
2	6500	Y-Type	LHS
3	12235	T-Type	LHS
4	16417	Y-Type	RHS
5	17688	T-Type	RHS
6	18425	T-Type	RHS
7	19376	T-Type	RHS
8	21420	T-Type	LHS
9	21990	T-Type	LHS
10	23252	T-Type	LHS
11	24600	Cross Jun	Both
12	33126	T-Type	RHS
13	36195	T-Type	RHS
14	37255	T-Type	LHS
15	40000	T-Type	RHS

BUILTUP AREA

CHAINAGE FROM	CHAINAGE TO	LENGTH
0	1200	1200
5600	5880	280
6300	6650	350
9600	10250	650
11500	12900	1400
14000	14300	300
16100	18500	2400
21200	21600	400
24450	24800	350
25800	27100	1300
30300	30500	200
32900	33200	300
37100	37400	300
39100	40300	1200
44600	45000	400

NOTE:

1. JUNCTION SHALL BE IMPROVED AS PER THE DRAWING NO OSRP/CEG/JN/01 TO 03
2. ALL OTHER JUNCTIONS WITH WBM CROSS ROAD, CEMENT, EARTHEN SHALL BE IMPROVED AS PER THE STANDARD DRAWINGS
3. PROPOER SIGNAGE SHALL BE PROVIDED FOR THE SAFETY OF THE TRAFFIC MOVEMENT AT THESE JUNCTIONS



PROJECT:-

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE.

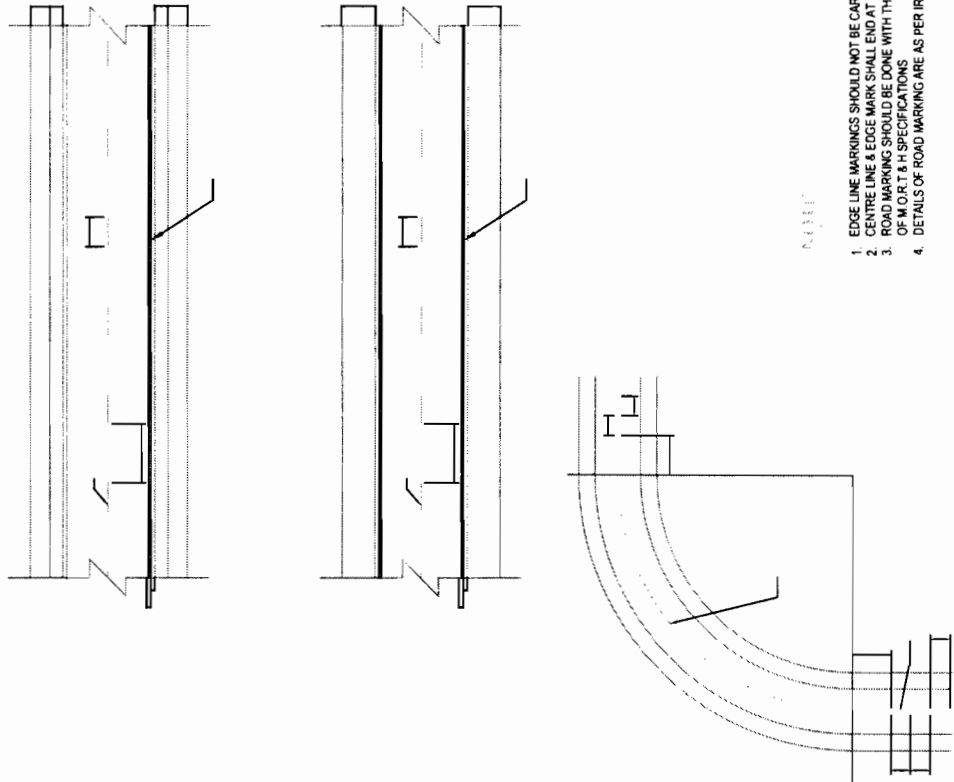
**CONSULTING**  
**ENGINEER, WBP GROUP LTD.**

E-12, Moj Colony, Matviya Nagar, Jaipur-17  
Tel: +91-141-2520899, 2521899, 2520556  
Fax: 2521348, e-mail: ceg@ceginfolia.com



SCHEDULE OF RRPMS, ROAD HUMPS & RUMBLE STRIP  
BHADRAK TO CHANDBALI-BALANCE WORK (SH-9, KM 0/00 TO 45/00)

DRG NO.	OSRP/CEG/SH-9/SCH/RRPM	DESIGNED BY	DRAWN BY	REV/RT	APPROVED
SH. NO.	54	DATE	18.01.13	REV	R1
SCALE	NTS		CEG	CEG	EE, PMU CE, WBP



NOTES

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. ROAD MARKING SHOULD BE DONE WITH THERMOPLASTIC PAINT CONFORMING TO CL. 803.4 OF M.O.R.T & H SPECIFICATIONS
4. DETAILS OF ROAD MARKING ARE AS PER IRC. 35-1997. CODE OF PRACTICE FOR ROAD MARKINGS

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

DRG NO. DS/SP/CEG/001	DESIGNED BY	CEG	REV	R-1	APPROVED
SH. NO. 29	DATE 18/07/13	CEG	REV	EE, PMU	CE, WBP
SCALE	NTS				

PROJECT:-  
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK

**CONSULTING ENGINEERS GROUP LTD.**  
E-12, Moji Colony, Malviya Nagar, Jaipur-17  
Tel: +91-141-2520899, 2521899, 2520556  
Fax: 2521348, e-mail: ceg@cegindia.com







SP-1



STOP

COMPULSORY  
KEEP LEFT

SP-2



RESTRICTION ENDS

SP-2(a)



SP-3



GIVE WAY

SP-4(a)



SPEED LIMIT

SP-4(b)



SPEED LIMIT

SP-4(d)



SPEED LIMIT

SP-4(e)



SPEED LIMIT

SP-5(a)



OVERTAKING  
PROHIBITED

SP-5(b)



ONE WAY

SP-5(c)



ONE WAY

SP-6



SCHOOL ZONE

SP-7



COMPULSORY  
SOUND HORN

SP-9(a)



RIGHT SIDE ROAD

SP-9(b)



LEFT SIDE ROAD

SP-10(a)



RIGHT HAND  
CURVE

SP-10(b)



LEFT HAND  
CURVE

SP-10(c)



RIGHT HAIR PIN  
BEND

SP-10(d)



LEFT HAIR PIN  
BEND

SP-10(e)



RIGHT REVERSE  
BEND

SP-10(f)



LEFT REVERSE  
BEND

SP-11



T-INTERSECTION

SP-12



PEDESTRIAN  
CROSSING

PROJECT:-

**CONSULTING  
ENGINEERS GROUP LTD.**

E-12, Moji Colony, Malviya Nagar, Jaipur-17  
Tel: +91-141-2520899, 2521899, 2520556  
Fax: 2521348, e-mail: [ceg@cegroupindia.com](mailto:ceg@cegroupindia.com)



STANDARD DRAWINGS

TYPICAL ROAD SIGNS (SHEET 1 OF 4)

DRG. NO.	OSR/PC/CE/RSR/ST	DESIGNED BY	DRAWN BY	REV./RT	APPROVED
SH. NO.	31	DATE	18/01/13	REV	R-1
SCALE	NTS				
		CEG	CEG	EE/PMU	CE/WBP

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-15(c)



DUAL C' WAY ENDS

SP-15(b)



DUAL C' WAY STARTS

SP-15(a)



NARROW BRIDGE

SP-15(d)



SERIES OF BENDS

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-24



PUBLIC TELEPHONE

SP-22



PETROL BUNK

SP-23



HOSPITAL

SP-25

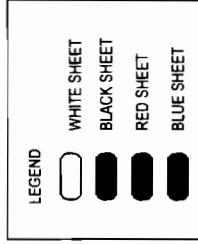


DISPENSARY

SP-26



EATING PLACE



- NOTES:
1. DETAILS OF ROAD SIGNS ARE AS PER IS: 15021.
  2. DETAIL OF STATE ROUTE MARKER SIGN IS AS PER IS: 15021.
  3. ALL MANDATORY AND CAUTIONARY SIGNS SHOULD BE HIGH INTENSITY VALUE ANGLE BEGON PERIODIC SIGNS AS PER IS: 15021.
  4. ALL MANDATORY SIGNS SHOULD COMPLY WITH STANDARDS OF HIGH INTENSITY ENGINEERED TYPE RETRO REFLECTIVE SHEETING AS PER CL. 6.01 OF TEQA SPECIFICATION.

PROJECT:-

ODISHA STATE ROAD PROJECT UNDER WORLD BANK

CONSULTING ENGINEERS GROUP LTD.

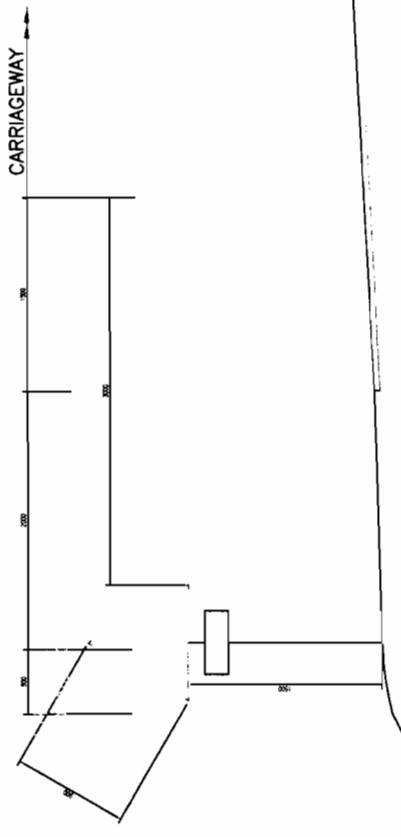
E-12, Moji Colony, Malviya Nagar, Jaipur-17  
Tel: +91-141-2520899, 2521899, 2520556  
Fax: 2521348, e-mail: ceg@cegroupindia.com



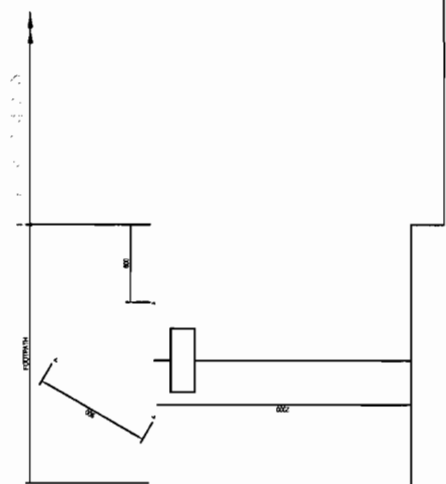
STANDARD DRAWINGS

TYPICAL ROAD SIGNS (SHEET 2 OF 4)

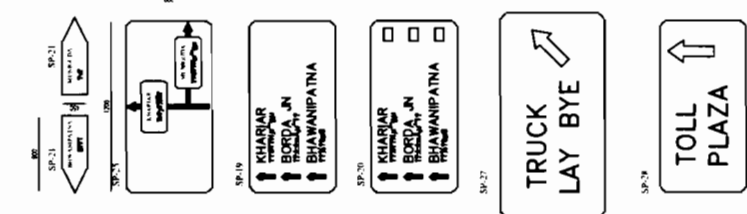
DRG NO.	DATE	REV	DESIGNED BY	DRAWN BY	REV'D BY	APPROVED
SH. NO.	32	18/01/13	CEG	CEG	EE, PMU	CE, WBP
SCALE	NTS					



MINIMUM CLEARANCE OF SIGNS  
IN UNKERBED SECTIONS



MINIMUM CLEARANCE OF SIGNS  
IN KERBED SECTIONS



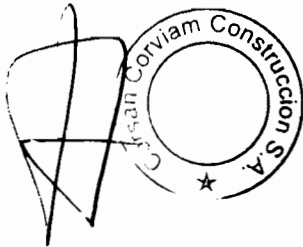
- NOTES**
1. ALL DIMENSIONS ARE IN MM UNLESS INDICATED OTHERWISE AS PER IRC-37-2001.
  2. ROAD SIGNS, SIZES OF ARROWS, LETTERS & NUMERALS IS AS PER IRC-37-2001.
  3. ALL ROAD SIGNS ARE NORMALLY BE PLACED AT RIGHT ANGLES TO THE LINE OF TRAVEL OF THE APPROACHING TRAFFIC.
  4. ALL WARNING SIGNS ARE NORMALLY BE LOCATED AT 120m IN ADVANCE OF THE HAZARD WARNED AGAINST IN NON-URBAN LOCATIONS. IN URBAN LOCATIONS, THE WARNING SIGNS ARE LOCATED AT ABOUT 50m AWAY FROM THE POINT OF HAZARD.
  5. ALL ROAD SIGNS ARE RETRO-REFLECTIVE SHEET OF HIGH INTENSITY GRADE WITH ENCAPSULATED LENSE FRIED OVER ALUMINIUM SHEET AS PER MORTH SPECIFICATIONS.
  6. ROUTE MARKER SIGN FOR NH IS AS PER IRC 2-1986.
  7. SIGNS WITH AN AREA UP TO 0.3sq. m. SHALL BE MOUNTED ON A SINGLE POST, AND FOR GREATER AREA TWO OR MORE SUPPORTS SHALL BE PROVIDED.
  8. POST ANGLES USED TO SUPPORT THE SIGN BOARD SHALL BE PAINTED WITH (2-COATS) APPROVED QUALITY (ANTI-CORROSIVE) ENAMEL PAINT OVER TWO COATS OF GOOD QUALITY PRIMER

**STANDARD DRAWINGS**  
**TYPICAL ROAD SIGNS (SHEET 3 OF 4)**

DRG NO. 08R/PC/EG/03	DESIGNED BY CEG	DATE 18/01/13	REV R-1	DRAWN BY CEG	REV/PI	APPROVED
SH. NO. 33	NTS			CEG	EE, PMU	CE, WBP
SCALE						

**PROJECT:-**  
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK

**CONSULTING ENGINEERS GROUP LTD.**  
E-12, Moji Colony, Malviya Nagar, Jaipur-17  
Tel: +91-141-2520899, 2521899, 2520556  
Fax: 2521348, e-mail: ceg@ceindia.com



SP-29



SP-30



SP-31



SP-32



SP-33



SP-34



SP-35



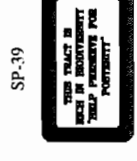
SP-36



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-50



SP-51

- NOTE:
1. DETAILS OF ROAD SIGNS ARE AS PER IRC: 67, 2001 & IRC: 67-2003
  2. DETAIL OF STAFFED WHITE MARKER SIGNS AS PER IRC: 31-1993
  3. ALL MANDATORY AND CAUTIONARY SIGNS SHOULD BE HIGH INTENSITY VERTICAL BEAM TYPE WITH REFLECTIVE SHEETING
  4. ALL REGULATORY SIGNS SHOULD CONFORM TO STANDARDS OF HIGH INTENSITY ENCLAVED TYPE WITH REFLECTIVE SHEETING AS PER SECTION 4.10.4 SPECIFICATION

**STANDARD DRAWINGS**  
**TYPICAL ROAD SIGNS (SHEET 4 OF 4)**

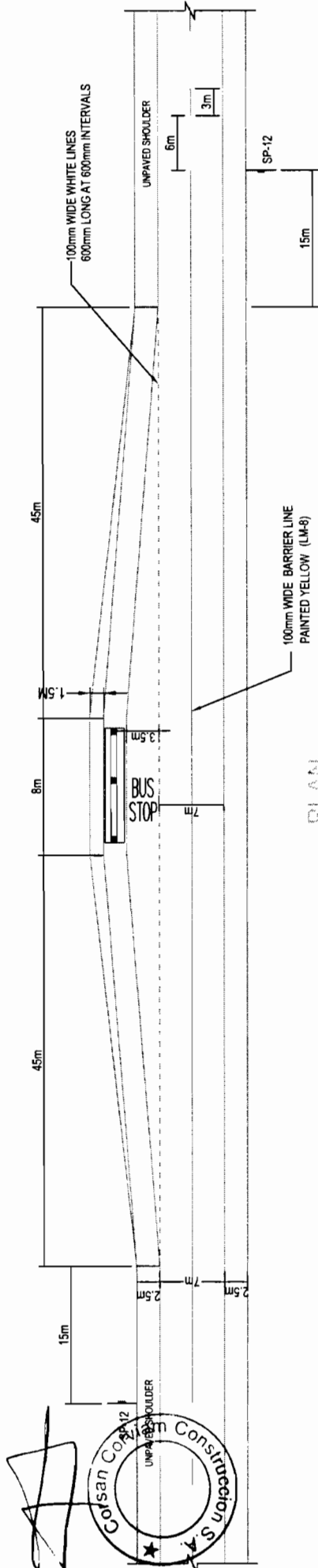
DRG NO. SH. NO.	DATE	REV	DESIGNED BY	DRAWN BY	APPROVED
34			CEG	CEG	
SCALE: NTS					

**PROJECT:-**  
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK

**CEG CONSULTING ENGINEERS GROUP LTD.**  
E-12, Moj Colony, Malviya Nagar, Jaipur-17  
Tel: +91-141-2520899, 2521899, 2520556  
Fax: 2521348, e-mail: ceg@cegingdia.com

**CEG**

# BUS BAY DETAILS

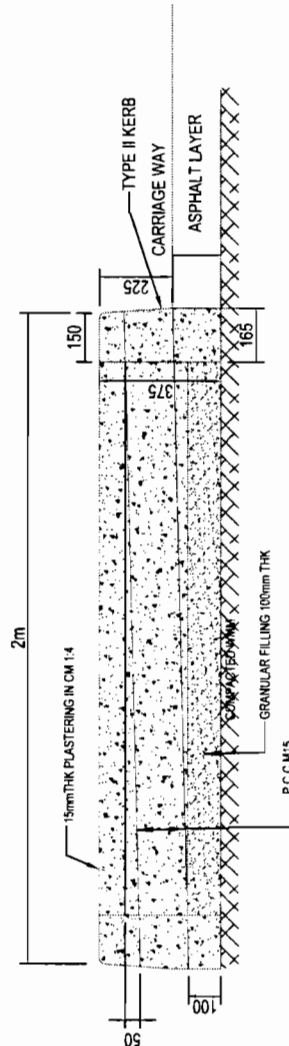


PLAN

# BUS BAY DETAILS

## NOTE

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED
2. PAVEMENT LAYERS OF CARRIAGEWAY SHALL BE EXTENDED IN THE BUS BAY AREA. AS PER THE CONTINUING TCS.
3. REFER IRC-35 FOR BUS STOP DRAWING AND DETAILS



SECTION (1:1)

## PROJECT:-

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK

**CONSULTING ENGINEERS GROUP LTD.**  
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Tel: +91-141-2520899, 2521899, 2520556  
Fax: 2521348, e-mail: ceg@cegroupindia.com



## TYPICAL BUS BAY SHEET - 1

(BHADRAK-CHANDBALI-BALANCE WORK)

DRG NO.	CGR/PC/CE/BB/01	DESIGNED BY	CEG	DRAWN BY	CEG	REV R1	APPROVED
SH. NO.	35	DATE	18/01/13	REV	R-1	EE-PMU	CE-WBP
SCALE	NTS						



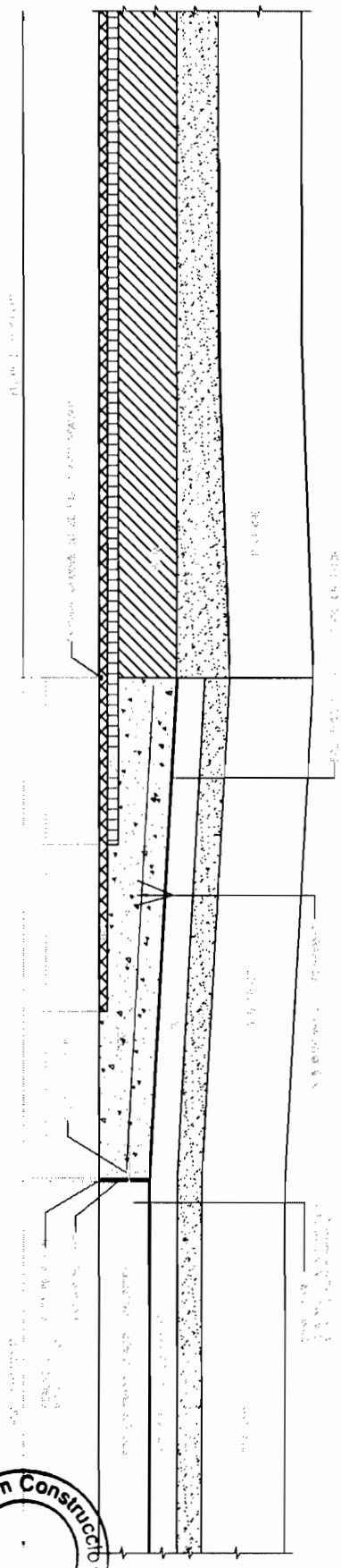




*[Handwritten signature]*



Corviam Construction S.A.  
Contractor



TYP. DETAILS OF TRANSITION SLAB BETWEEN RIGID & FLEXIBLE PAVEMENT

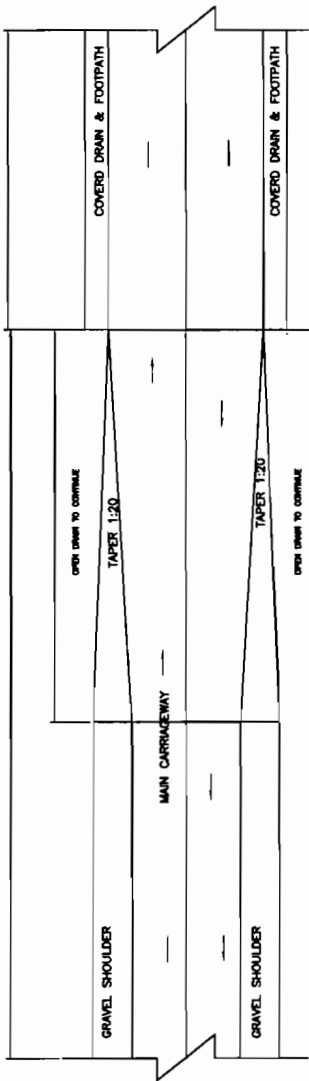
NOTES:

1. The rigid slab shall be constructed as per the specifications of the contract.
2. The transition slab shall be constructed as per the specifications of the contract.
3. The flexible pavement shall be constructed as per the specifications of the contract.
4. The transition slab shall be constructed as per the specifications of the contract.

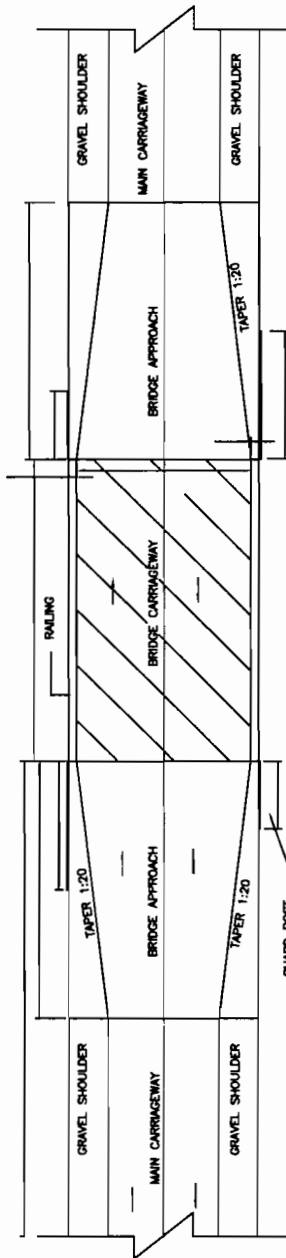
*[Handwritten signature]*

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

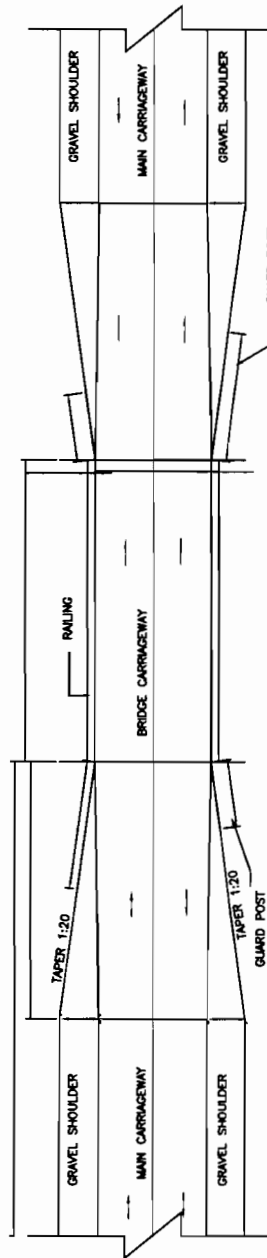
<p><b>PROJECT:-</b> ODISHA STATE ROAD PROJECT UNDER WORLD BANK</p>		<p><b>TYPICAL DETAILS OF TRANSITION SLAB BETWEEN RIGID AND FLEXIBLE PAVEMENT (BHADRAK-CHANDBALI-BALANCE WORK)</b></p>			
		DRG NO. SH. NO.	DATE 18/01/13	REV R-1	DRAWN BY CEG
<p><b>CONSULTING ENGINEERS GROUP LTD.</b> E-12, Moji Colony, Malviya Nagar, Jaipur-17 Tel: +91-141-2520899, 2521899, 2520556 Fax: 2521348, e-mail: ceg@cegindia.com</p>		<p>DESIGNED BY CEG</p>			
<p><b>CEG</b></p>		<p>SCALE NTS</p>			



TRANSITION BETWEEN RURAL 12m SECTION TO VILLAGE 10m WITH DRAIN SECTION (1:10)



TRANSITION BETWEEN RURAL 12m SECTION TO BRIDGES WITH 11m CLEAR CARRIAGEWAY



TRANSITION BETWEEN RURAL 12m SECTION TO NARROW EXISTING BRIDGES SECTION

- NOTES**
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS INDICATED OTHERWISE
  2. DETAILS OF STRUCTURES REFER TO DRAWING DRS.
  3. CLEARANCE OF OVERHEAD POWER LINES SHALL BE ENOUGH TO CLEAR HEIGHT IS MORE THAN 3 METRES AT BRIDGE APPROACHES
  4. FOR HAZARD MARKER DETAIL REFER DWG. NO. OSRP/CEG/AM & GP
  5. FOR HAZARD MARKER DETAIL REFER TYPICAL ROAD SIGN & DETAILS OF ROAD DELINEATORS
  6. DRAWING TO BE READ WITH TDS- 1 TO TDS-16 AND DWG. NO. OSRP/CEG/ROAD/02

TYPICAL DETAILS OF TRANSITION OF DIFFERENT ROAD SECTION

(BHADRAK-CHANDBALI-BALANCE WORK)

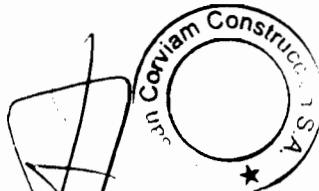
DRG NO.	OSRP/CEGTR	DESIGNED BY	CEG	DRAWN BY	CEG	REV'D	REV R1	APPROVED	CE/WBP
SH. NO.	15	DATE	18/01/13	REV	R-1				
SCALE	NTS								

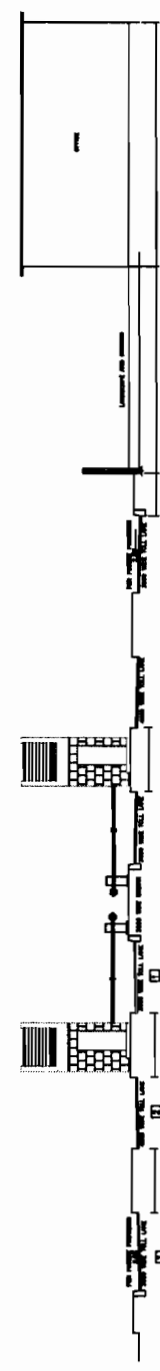
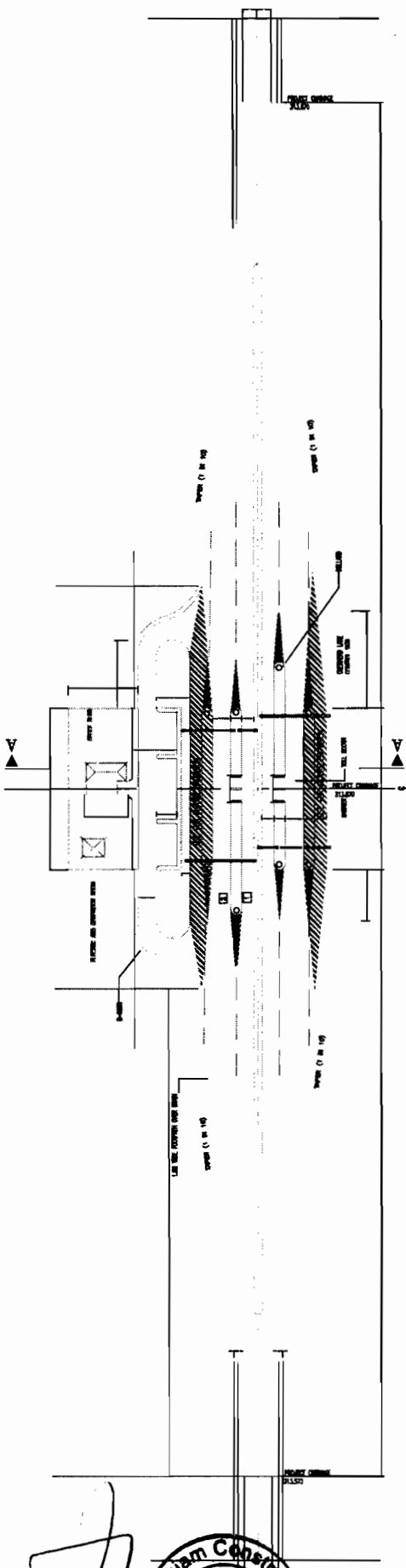
PROJECT:-

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK

**CONSULTING ENGINEERS GROUP LTD.**  
E-12, Moji Colony, Malviya Nagar Jaipur-17

Tel: +91-141-2520899, 2521899, 2520556  
Fax: 2521348, e-mail: ceg@cegroupindia.com





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

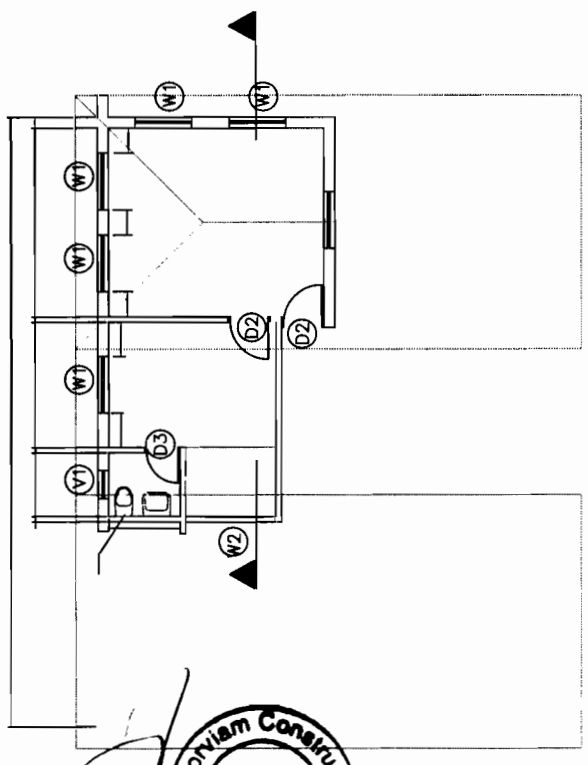
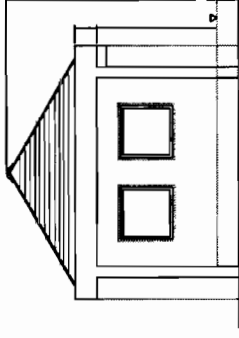
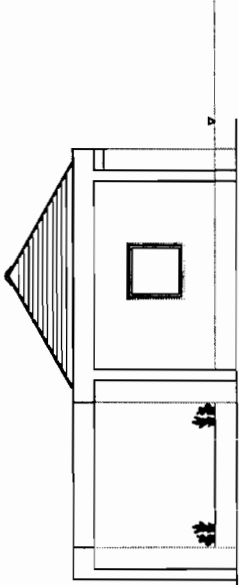
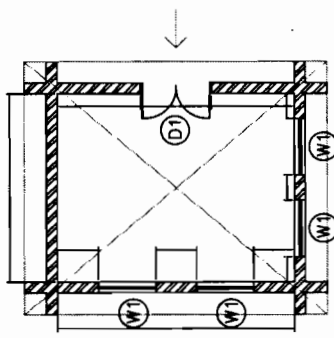
- NOTES:-
- DIMENSIONS SHOULD BE PROVIDED IN TOLL-LANES
  - ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SPECIFIED
  - DIMENSIONS SHOULD BE SCALED AND ONLY WRITTEN DIMENSIONS TO BE FOLLOWED

LOCATION: KM.14+00 TO KM.24+140

**PROJECT:-**  
 ODISHA STATE ROAD PROJECT  
 UNDER WORLD BANK ASSISTANCE.

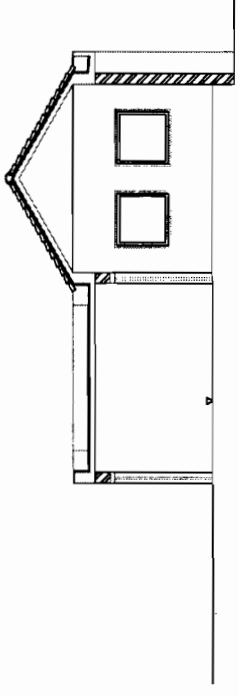
STANDARD DRAWINGS  
 TOLL PLAZA LAYOUT  
 TOLL PLAZA LOCATION :-KM. 19+500 TO KM.19+840  
 (BHADRAK-CHANDBALI-BALANCE WORK)

DRG NO. (SERIALIZED-DRAWING)	DATE	REV	NTS	DESIGNED BY :	CDP	CHK. BY :	CDP
SH. NO. 45	18.01.13	R1					
SCALE	NTS						



SCHEDULE OF DOORS & WINDOWS

S. NO.	TYPE	MASONRY WIDTH	OPENING HEIGHT	CILL LEV	LINTEL LEV
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:-

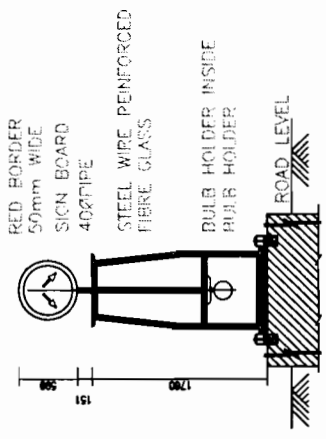
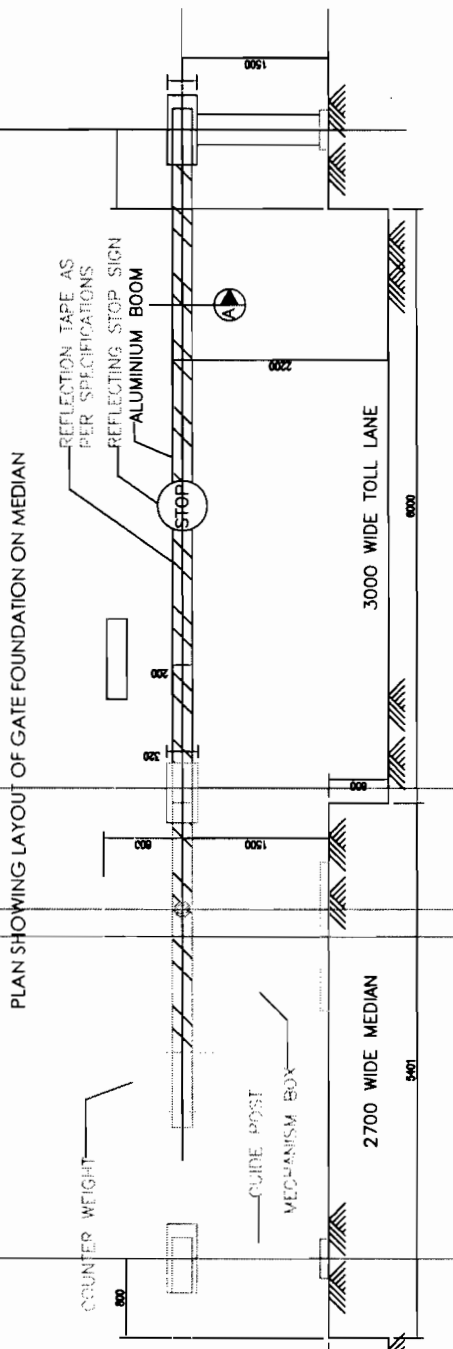
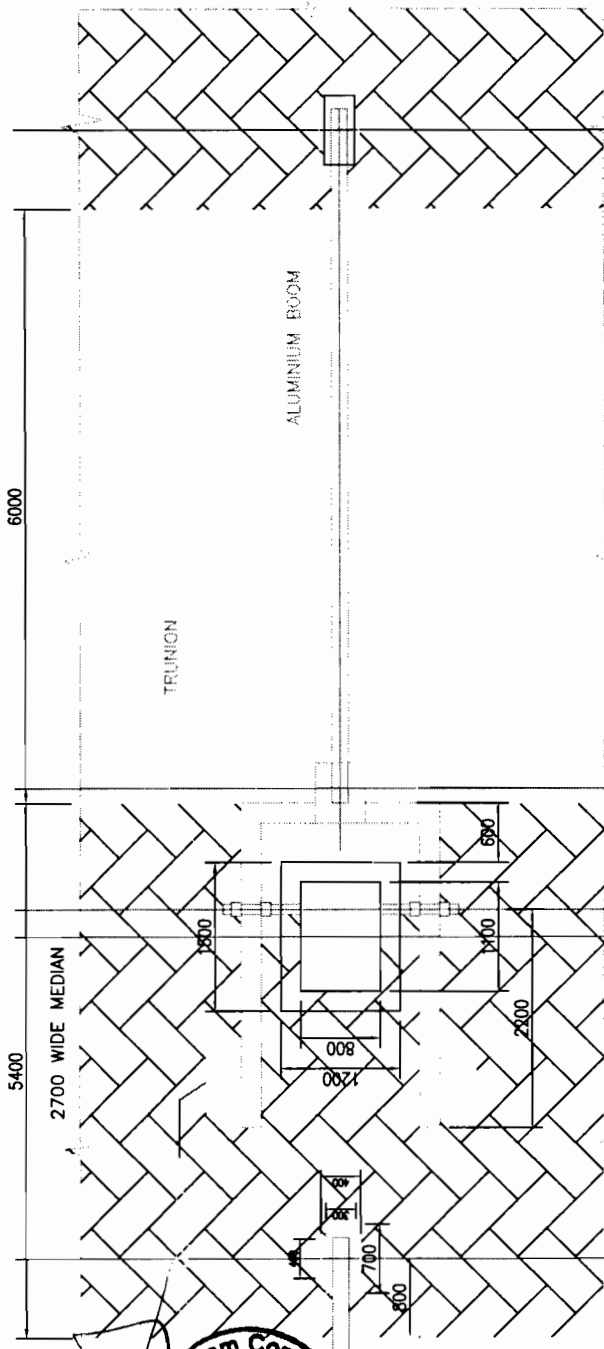
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE.

STANDARD DRAWINGS

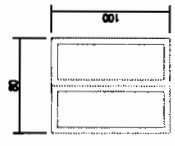
TOLL PLAZA MAIN OFFICE  
TOLL PLAZA LOCATION :-KM.19+500 TO KM.19+840  
(BHADRAK-CHANDBALI-BALANCE WORK)

DRG NO. CORP/ECORC-AM/1702	DATE 18.01.13	REV R1	DESIGNED BY	CHKD	APPROVED
SH. NO. 46	DATE	REV	BY	BY	BY
SCALE	NTS		CD	CD	CD





TYPICAL DETAILS OF BOLLARD



DETAIL A

Note: All dimensions in millimeters if not specified

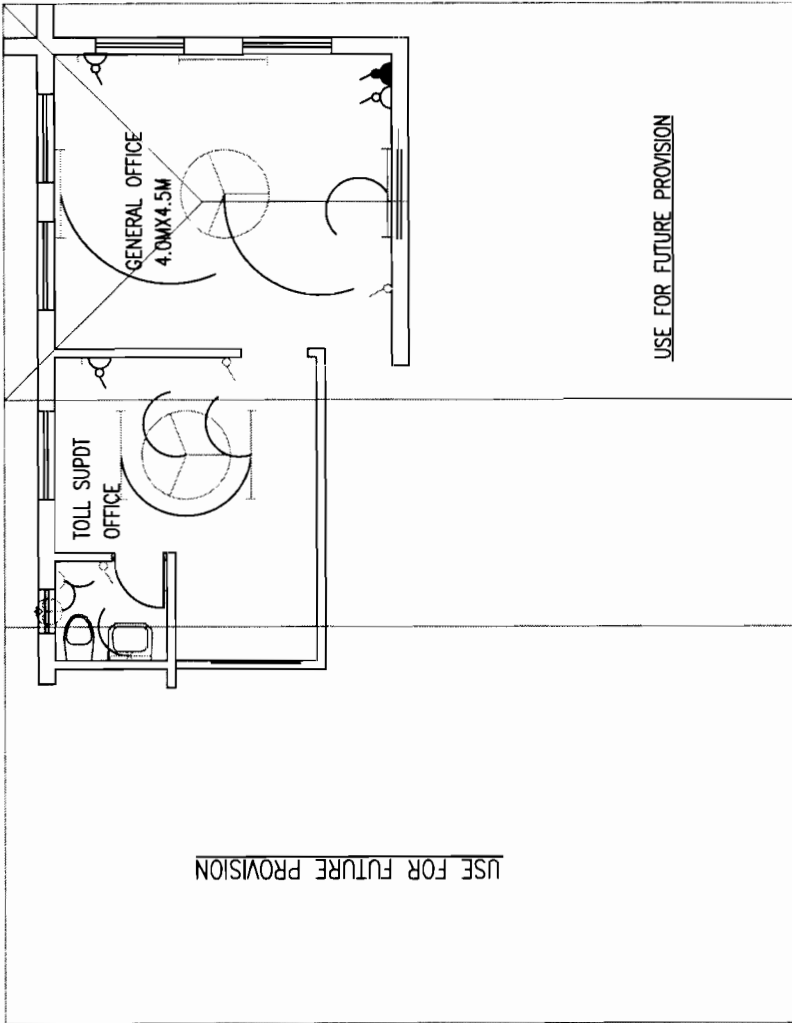
**PROJECT:-**

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE.

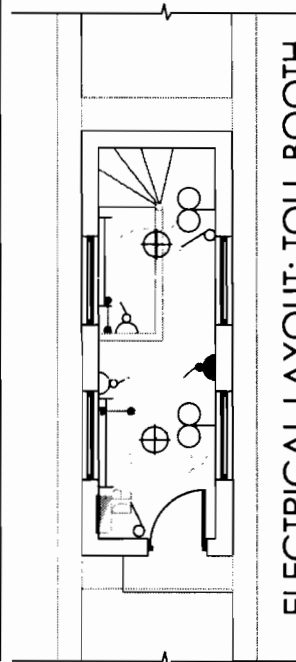
**STANDARD DRAWINGS  
BARRIER GATE FOR TOLL PLAZA**

TOLL PLAZA LOCATION :- KM.19+500 TO KM.19+840  
(BHADRAK-CHANDBALI-BALANCE WORK)

DRG NO. / SH. NO.	DATE	REV	APPROVED
48	18.01.13	R1	
SCALE	NTS	DESIGNED BY	DESIGNED BY
		CSB	CSB
		CHECKED BY	CHECKED BY
		CSB	CSB
		REV. BY	REV. BY
		CSB	CSB
		APPROVED	APPROVED
		CSB	CSB



**ELECTRICAL LAYOUT: TOLL PLAZA MAIN OFFICE**

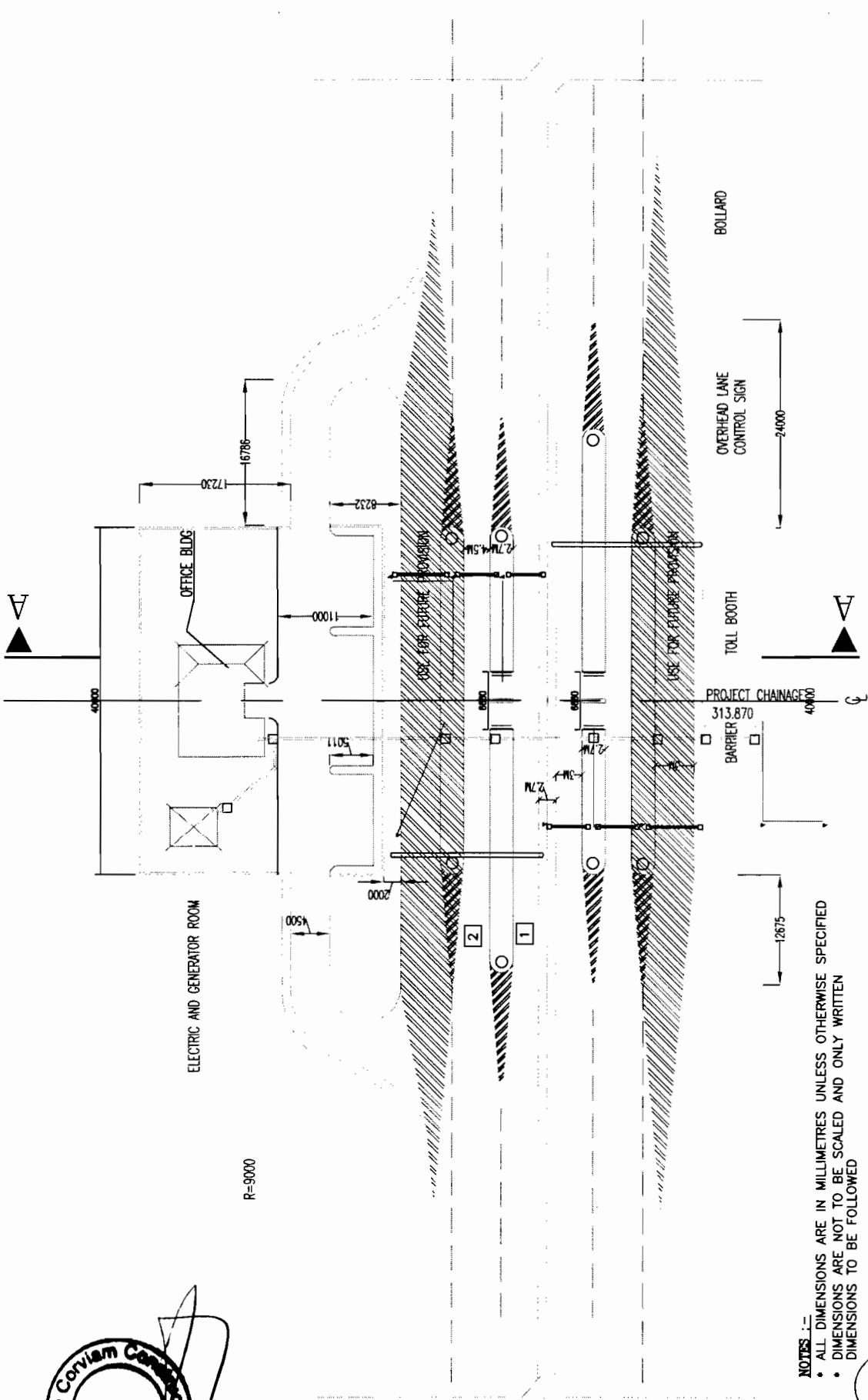


**ELECTRICAL LAYOUT: TOLL BOOTH**

- 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		DESIGNED BY		REV. R1		APPROVED	
ELECTRICAL LAYOUT		DRAWN BY		CD		CD/PAU	
TOLL PLAZA AND MAIN OFFICE		DATE		REV		CD	
TOLL PLAZA LOCATION :-KM.19+500 TO KM.19+840		18.01.13		R1		CD	
(BHADRAK-CHANDBALI-BALANCE WORK)		49		NTS		CD	
DRG NO.	CDR/CDR/C-04/M/13	DATE	18.01.13	REV	R1	DESIGNED BY	CD
SH. NO.	49	DATE	18.01.13	REV	R1	APPROVED BY	CD/PAU
SCALE							CD/PAU

**PROJECT:-**  
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE.



**NOTES :-**

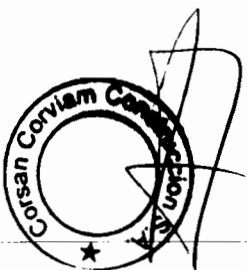
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE NOT TO BE SCALED AND ONLY WRITTEN DIMENSIONS TO BE FOLLOWED

**STANDARD DRAWINGS**  
**ELECTRICAL LAYOUT - TOLL PLAZA**  
**TOLL PLAZA LOCATION :- KM. 19+500 TO KM. 19+840**  
**(BHADRAK-CHANDBAL-BALANCE WORK)**

DRG NO.	DHRP/CEBC-44/11/106		
SH. NO.	50	DATE	18.01.13
SCALE		REV	R1
		REV	R1
		NTS	

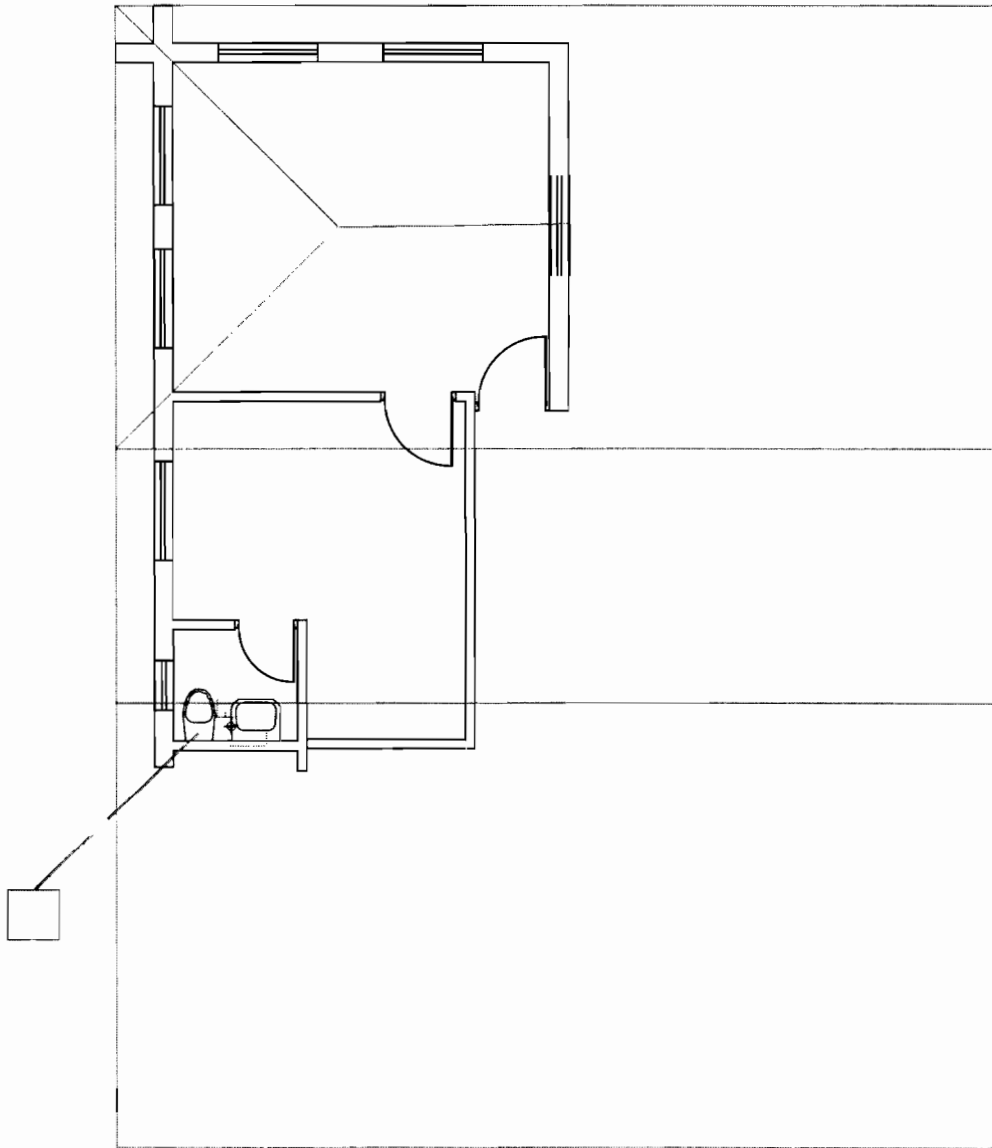
APPROVED	REV. R1	DESIGNED BY	CEB
CE, WPP	CE/WNU	DRAWN BY	CEB

**PROJECT:-**  
**ODISHA STATE ROAD PROJECT**  
**UNDER WORLD BANK ASSISTANCE.**



*(Signature)*  
 Chief Engineer  
 World Bank Project  
 O/o the E.J. Choudhury  
 World Bank Projects, Odisha  
 Bhubaneswar  
 Engineer

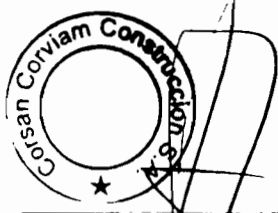




**STANDARD DRAWINGS**  
**PLUMBING LAYOUT - TOLL PLAZA**  
**TOLL PLAZA LOCATION - KM.19+500 TO KM.19+840**  
**(BHADRAK-CHANDBAL-BALANCE WORK)**

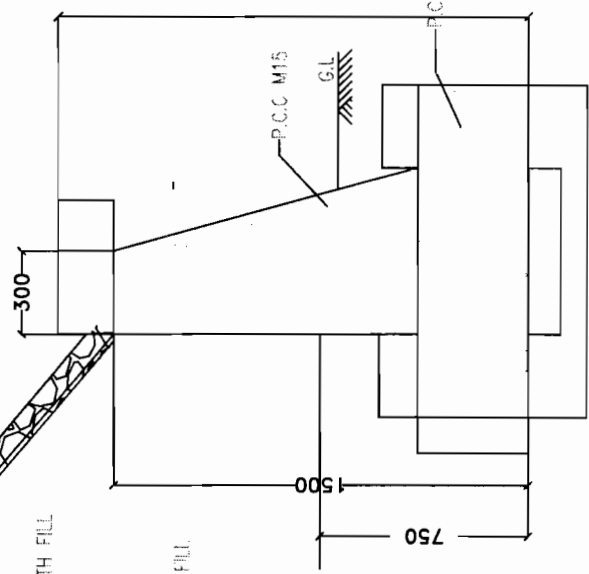
**PROJECT:-**  
**ODISHA STATE ROAD PROJECT**  
**UNDER WORLD BANK ASSISTANCE.**

DRG NO.	DATE	REV	DESIGNED BY	APPROVED
SH. NO.	18.01.13	R1	CSD	CL. MP
SCALE	NTS			



Under Engineer  
 World Bank Project  
 Odisha  
 Bhubaneswar

300mm THK STONE PITCHING  
(SLOPE 1:1.5)  
100mm FILTER LAYER  
TOP OF EARTH FILL

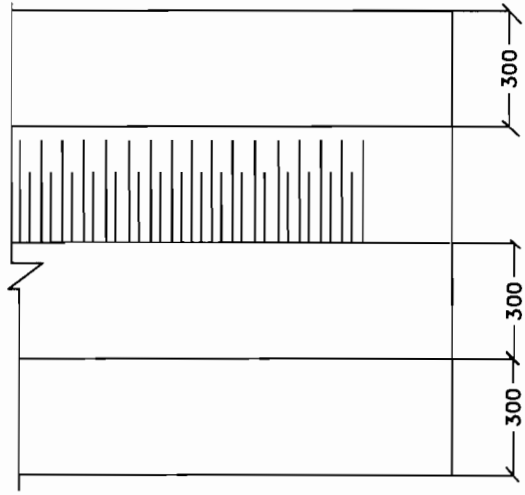


TOE WALL FOR POND  
( CROSS SECTION )

Sl No.	Items	Change at km	Location left/right	Length of toe wall in Mtrs
1	Pond	1.015	L	15
2	Pond	2.485	L	25
3	Pond	2.822	R	55
4	Canal	4.424	R	1180
5	Canal	4.47	L	430
6	Canal	5.83	R	255
7	Pond	6.28	R	20
8	Pond	6.19	R	20
9	Pond	7.28	L	100
10	Pond	13.302	R	30
11	Pond	12.98	R	24
12	Pond	12.9	R	34
13	Pond	13.112	R	20
14	Pond	11.78	L	15
15	Pond	19.555	L	30
16	Pond	20.4	R	55
17	Pond	20.4	L	25
18	Pond	20.6	L	15
19	Pond	20.67	L	25
20	Pond	20.725	R	10
21	Pond	20.758	R	5
22	Pond	20.9	L	2
23	Pond	21.2	R	20
24	Pond	21.2	R	30
25	Pond	22.348	L	30
26	Pond	22.542	R	45
27	Pond	22.9	R	20
28	Pond	24.9	R	25
29	Pond	25.05	L	30
30	Pond	27.7	R	20
31	Pond	27.705	L	65
32	Pond	27.79	R	30
33	Pond	28	L	270
34	Pond	28.062	R	115
35	Pond	28.8	L	80

Sl No.	Items	Change at km	Location left/right	Length of toe wall in Mtrs
36	Pond	29.147	R	315
37	Pond	29.25	L	55
38	Pond	29.3	L	30
39	Pond	29.5	R	15
40	Pond	29.5	R	15
41	Pond	29.555	L	75
42	Pond	29.715	L	50
43	Pond	29.7	R	45
44	Pond	30.013	L	30
45	Pond	30.585	R	30
46	Pond	30.683	L	15
47	Pond	30.97	L	45
48	Pond	31.3	L	40
49	Pond	31.417	R	30
50	Pond	31.823	R	35
51	Pond	31.96	R	440
52	Pond	32.45	R	25
53	Pond	32.45	R	25
54	Pond	32.49	L	210
55	Pond	33.2	L	25
56	Pond	33.6	L	55
57	Pond	33.87	L	135
58	Pond	34	R	45
59	Pond	36.1	L	40
60	Pond	36.104	R	70
61	Pond	36.428	L	15
62	Pond	39.1	R	55
63	Pond	39.263	L	20
64	Pond	39.64	R	20
65	Pond	40.266	R	25
66	Pond	40.36	L	30
67	Pond	41.5	L	25

PLAN OF TOE WALL FOR WATER BODY



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

TYPICAL PCC TOE WALL WITH STONE PITCHING FOR WATER BODIES AS ENVIRONMENTAL MITIGATION.

PROJECT:-

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

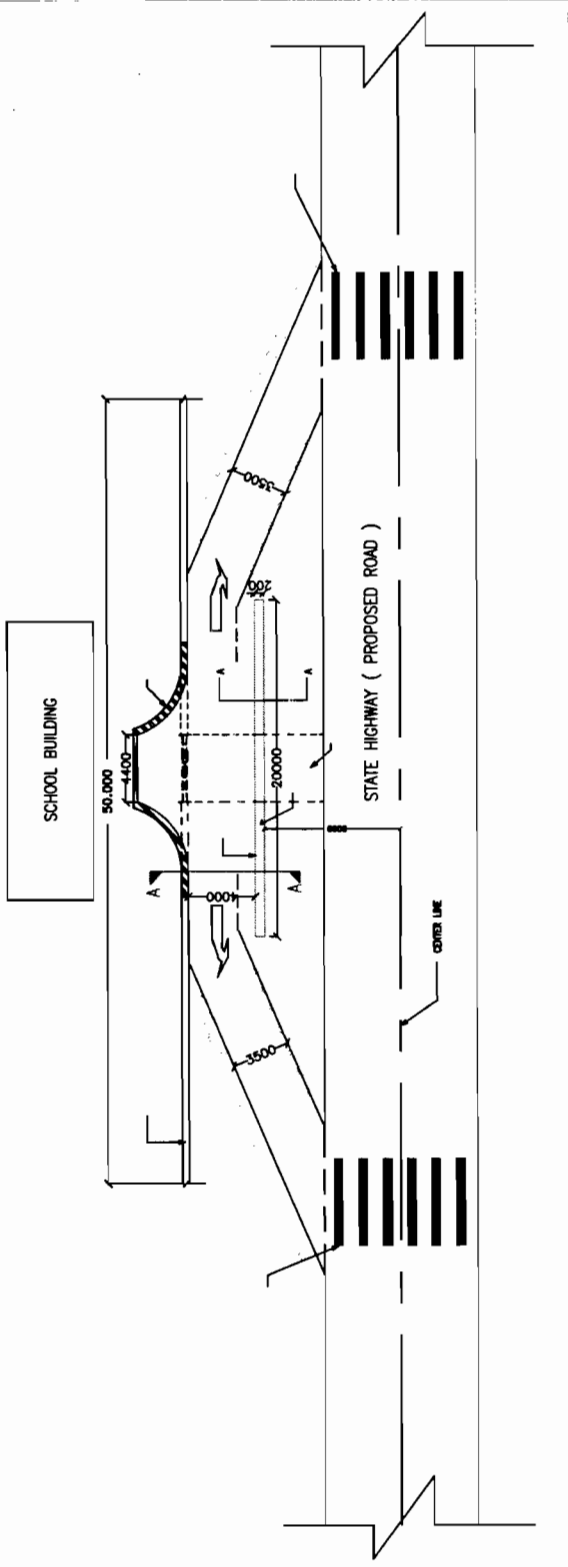
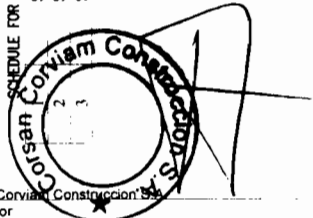
**CONSULTING ENGINEERS GROUP LTD.**  
E-12, Moji Colony, Malviya Nagar Jaipur-17  
Tel: +91-141-2520899, 2521899, 2520556  
Fax: 2521348, e-mail: ceg@cegindia.com



(BHADRAK-CHANDBALI BALANCE WORK)

DRG NO. [OSRP/CEG/SH-16/EN/03]	DESIGNED BY	DRAWN BY	PREPARED BY
SH. NO. [ ]	DATE [18/01/13]	REV [R-1]	
SCALE	NTS	CEG	CEG
		CEG	EE, PMU CE, WBP

SCHEDULE FOR INTERCEPTIVE BARRICADE	
School	29,950
School	40,720
School	41,800



- 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 AREA, G.P 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 INFRONT OF THE GATE

**PROJECT:-**

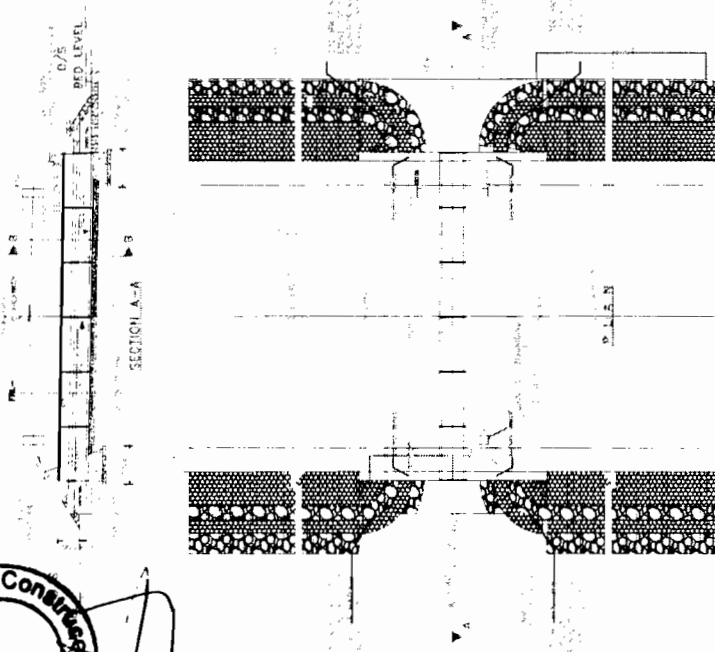
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

**CONSULTING ENGINEERS GROUP LTD.**  
E-12, Moji Colony, Malviya Nagar Jaipur-17  
Tel: +91-141-2520899, 2521899, 2520556  
Fax: 2521348, e-mail: ceg@ceindia.com



METAL BARRICADES FOR EDUCATIONAL AND MEDICAL INSTITUTIONAL APPROACHES AS ENVIRONMENTAL MITIGATION PLAN.			
(BHADRAK-CHANDBALL_BALANCE WORK)			
DRG. NO.	OSRP/CEG/SH-16/ENV/05	DESIGNED BY	APPROVED
SH. NO.	DATE 18/01/13 REV	R-1	EE, PMU
SCALE	NTS		CEG
			CE, WBP

# REPTILE UNDER PASS



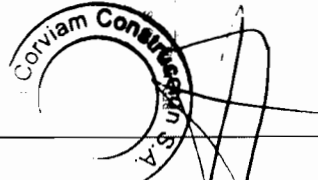
SCHEDULE	
Sl. No	Proposed Chainage
1	26+430
2	40+974

REPTILE UNDER PASS+PIPE CULVERT (GEN.)

DRG NO. : OSR/PIEV-14	PREPARED BY : EE PMU	APPROVED : CE WBP
SCALE : NTS		

Rev No. :	DATE : JAN, 2013
-----------	------------------

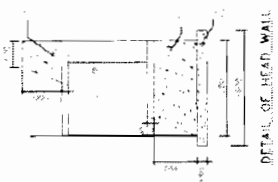
OSISHA STATE ROADS PROJECT  
Works Department, Govt. of Orissa



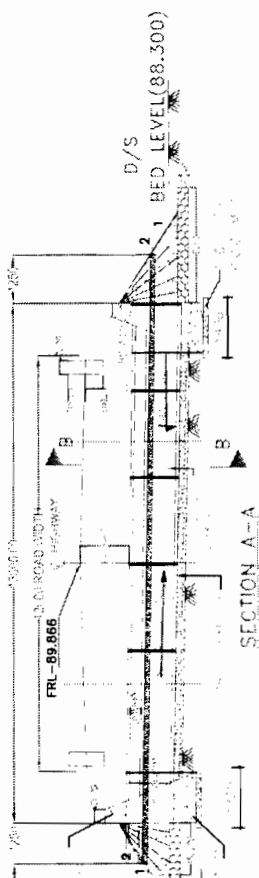
Corviam Construction S.A.  
Contractor

Chief Engineer,  
Works Department, Govt. of Orissa  
O/o the E.I.C. (Civil), Orissa  
Bhubaneswar.

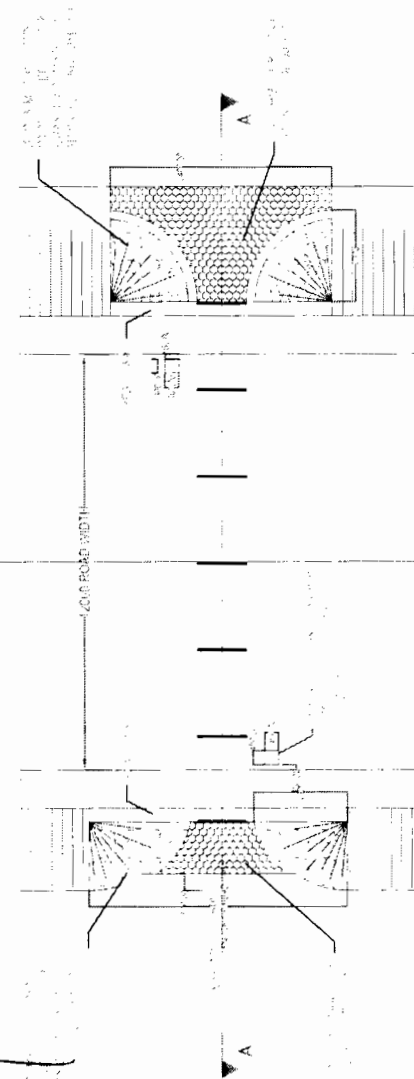
NOTES:



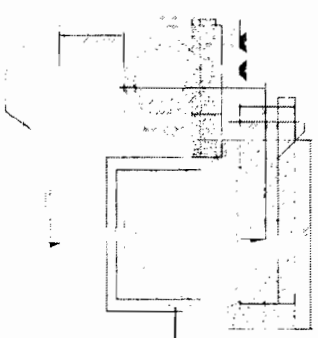
DETAIL OF HEAD WALL



SECTION A-A



UTILITY DUCT PLAN



SECTION B-B

Sl. No.	Chainage	Sl. No.	Chainage
1	+980	17	20+250
2	5+525	18	21+150
3	5+925	19	21+700
4	6+250	20	24+425
5	6+700	21	24+825
6	9+500	22	25+750
7	10+300	23	27+150
8	11+475	24	30+250
9	12+950	25	30+550
10	13+925	26	32+850
11	14+350	27	33+250
12	16+050	28	37+450
13	18+550	29	39+050
14	18+950	30	40+375
15	19+250	31	42+050
16	20+050	32	44+550
		33	45+025

SCHEDULE OF UTILITY DUCT

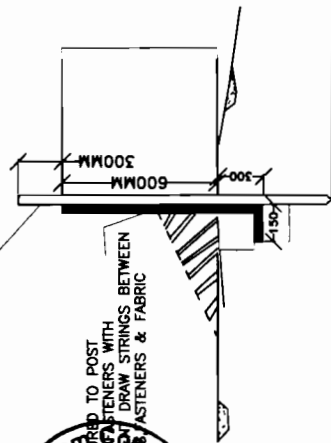
**Corsan Corviam Construction S.A.**  
 BED LEVEL (88.500)  
 Contractor

Chief Engineer,  
 World Bank Project,  
 Odisha  
 Bhubaneswar.

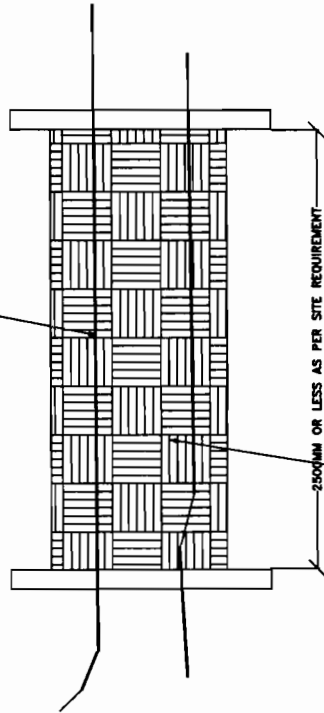
O/o the E.I.C.(Civil), Odisha

UTILITY DUCT+CULVERT (GEN.)		BHADRAK-CHANDBAL-BALANCE WORK	
DRG. NO. :	OSR/PEMV-15	PREPARED BY	APPROVED
SCALE:	NTS	EE PMU	GE WRP
Ref No. :	DATE : JAN, 2013		
OSISHA STATE ROADS PROJECT		Works Department, Govt. of Orissa	

FENCE POST 75MM DIA @ 2500MM C/C



DRAW STRING RUNNING THROUGH FABRIC



SHEET MADE OF COCONUT

FIBER WITH HDPE NETS OF WEIGHT > 600GM/SQM

SILT FENCE SEDIMENT BARRIER

NO SCALE

SCHEDULE:

LENGTH :- LUMP SUM QNTY - 2000M

PROJECT:-

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

**CONSULTING  
ENGINEERS GROUP LTD.**

E-12, Moji Colony, Malviya Nagar Jaipur-17  
Tel: +91-141-2520899, 2521899, 2520556  
Fax: 2521348, e-mail: ceg@cegindia.com



Chief Engineer  
World Bank Project  
O/o the E.I.C. Employer  
Bhubaneswar

TYPICAL STANDARD DRAWING FOR SILT FENCE

(BHADRAK-CHANDBALL\_BALANCE WORK)

DRG NO. OSRP/CEG/SH/EN/03	DESIGNED BY	DRAWN BY	PREPARED BY/APPROVED
SH. NO.	DATE 18/01/13	REV R-1	CEG
SCALE	NTS		
	CEG	CEG	EE, PMU
			CE, WBP



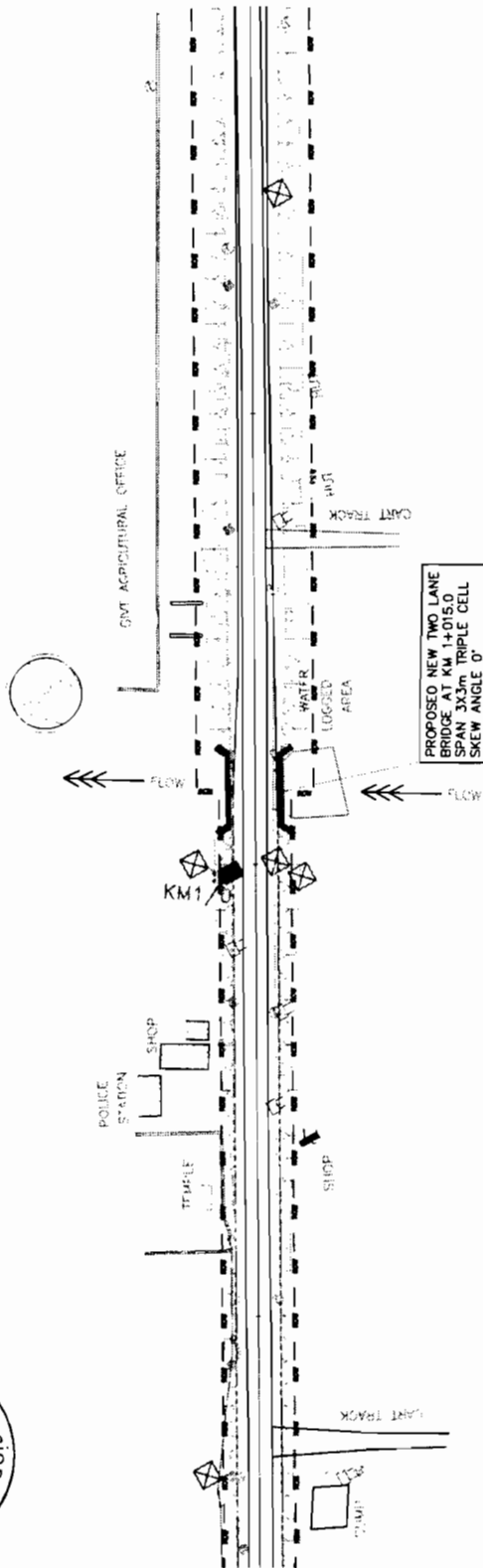






NOTES:-

TO CHANDBALI



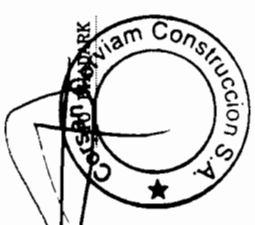
SITE PLAN

DESIGNED BY : CHANDRASEKHAR S. SINGH	DATE : 12.01.2013	APPROVED BY :	DATE :
CHECKED BY :	DATE :	DATE :	DATE :

SITE PLAN  
BRIDGE AT PROPOSED CH. 1+015.0  
(2 NO POLO SALANDI BYPASS)

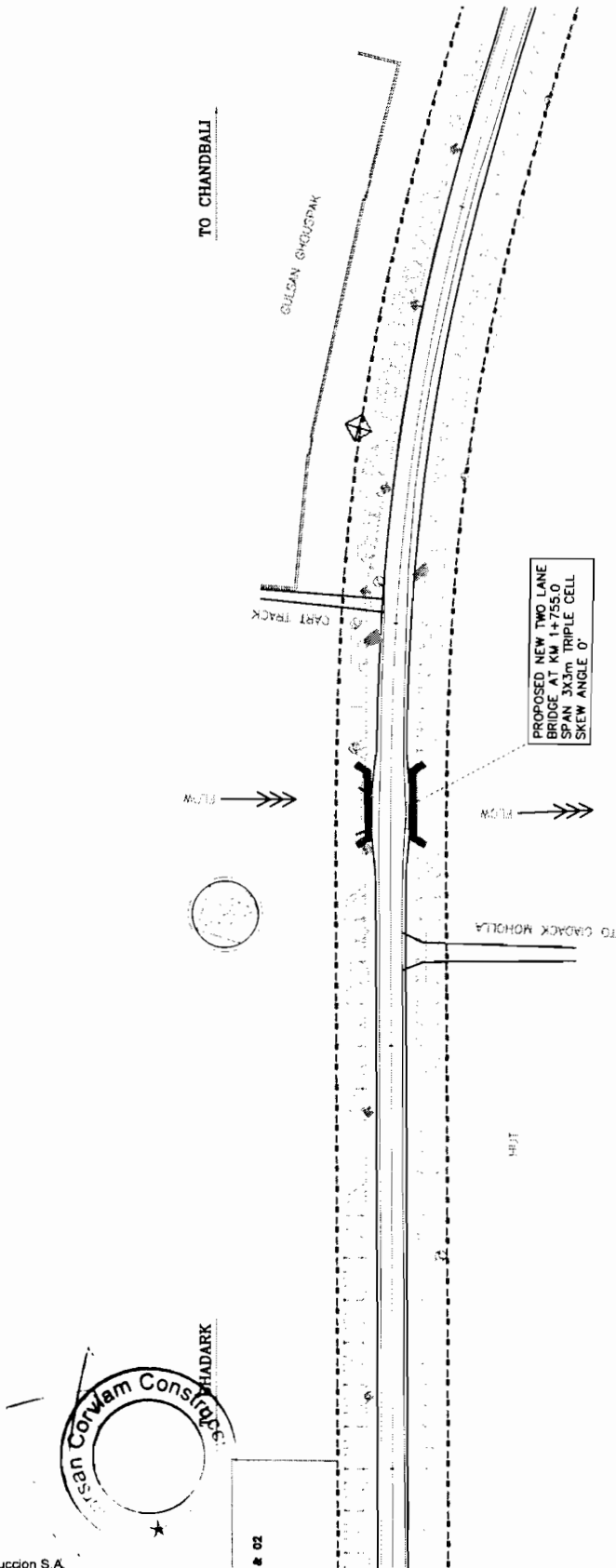
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

CONSULTING  
ENGINEERS GROUP LTD.  
E-12, 1st Floor, Market, Bhubaneswar - 751005  
Tel. 2571191-2520899, 2571890, 2520908  
Fax. 2571348, E-mail: ceo@odishaeg.com





NOTES:-



SITE PLAN

PROJECTS:

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

CONSULTING  
ENGINEERS GROUP LTD.  
E-12, 1st Colony, Jajpur, Bhubaneswar-751006  
Ph: 2531348, E: info@corviam.com



SITE PLAN  
BRIDGE AT PROPOSED CH. 1+755.0  
(3 NO. POLO)

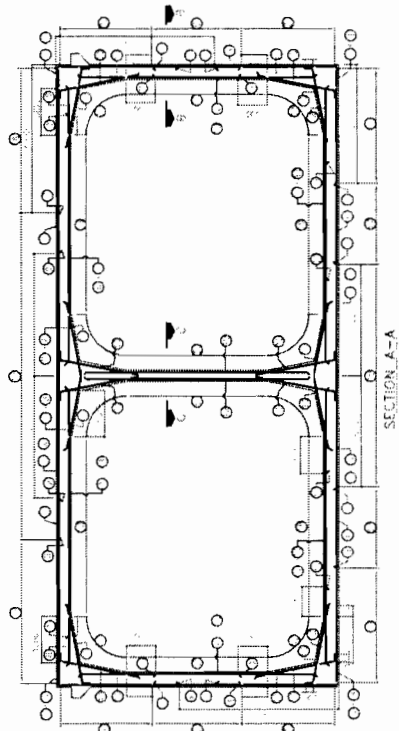
DATE	BY	CHKD BY	APPROVED BY



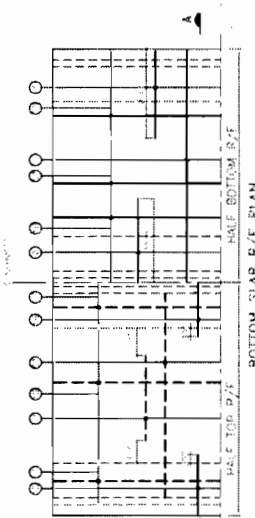
NOTES:

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.  
 2. ALL REINFORCEMENT SHALL BE AS PER IS: 456-1978.  
 3. ALL REINFORCEMENT SHALL BE AS PER IS: 1786-1983.  
 4. ALL REINFORCEMENT SHALL BE AS PER IS: 1786-1983.  
 5. ALL REINFORCEMENT SHALL BE AS PER IS: 1786-1983.  
 6. ALL REINFORCEMENT SHALL BE AS PER IS: 1786-1983.  
 7. ALL REINFORCEMENT SHALL BE AS PER IS: 1786-1983.  
 8. ALL REINFORCEMENT SHALL BE AS PER IS: 1786-1983.  
 9. ALL REINFORCEMENT SHALL BE AS PER IS: 1786-1983.  
 10. ALL REINFORCEMENT SHALL BE AS PER IS: 1786-1983.

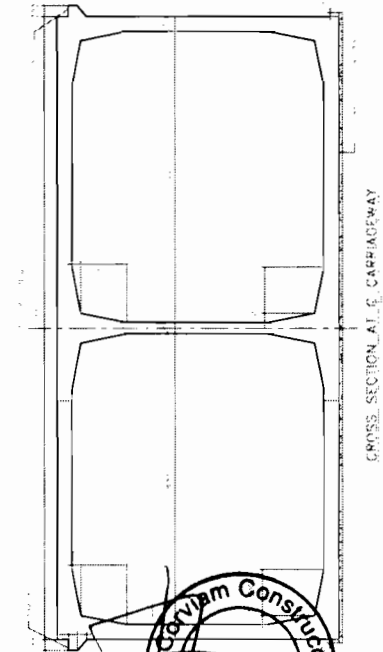
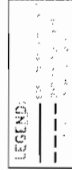
REFERENCE DRAWINGS:



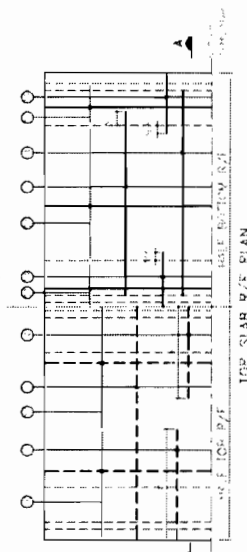
SECTION A-A



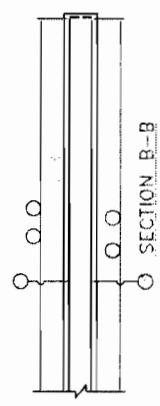
REINFORCEMENT DETAILS



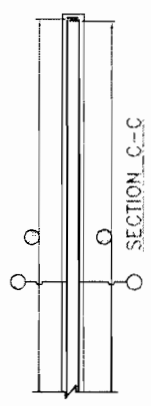
CROSS SECTION AT C, CARRIAGEWAY



TOP SLAB R/F PLAN



SECTION B-B



SECTION C-C

Drawing No.	01/2013/10/10/10/10/10
Date	10/10/10
Scale	1:100
Author	01
Checked by	01
Approved by	01

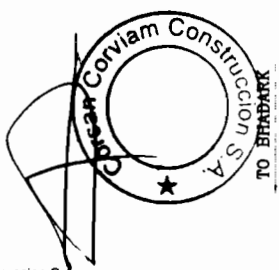
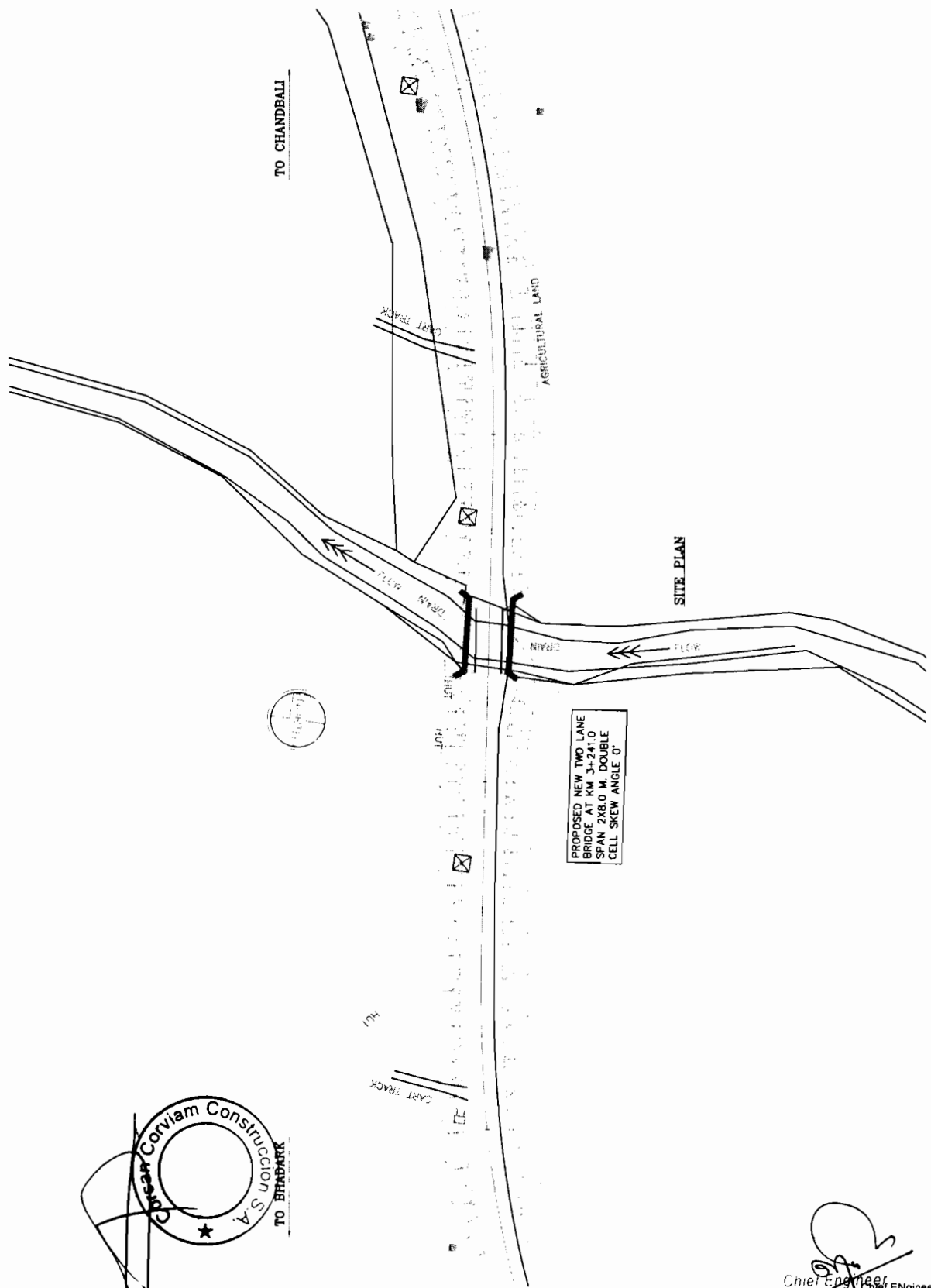
DIMENSION AND REINFORCEMENT DETAILS  
 BRIDGE AT PROPOSED CH. 3+241.0  
 (MIRJAPUR VILLAGE)

ODISHA STATE ROAD PROJECT  
 UNDER WORLD BANK ASSISTANCE

CONSULTING  
 ENGINEERS GROUP LTD.  
 E-12, Mid-City, New Market, Cuttack-751005  
 Ph. No. 0674-2521889, 2521890, 2521891  
 Fax. No. 0674-2521892, 2521893, 2521894  
 E-mail: ceg@cegroup.com

Corsan Corviam Construction S.A.  
 Contractor

NOTES:-



Corviam Construccion S.A.  
Contractor

Chief Engineer  
Working in the  
Office of the E.I.C. (CIV), Odisha  
R.S.W.P.

<p>CONSULTING ENGINEERS GROUP LTD. E-15/103 Colony, Sakinaka, Bhubaneswar-751009, Odisha Tel: +91-674-2520899, 2521896, 2520556 Fax: 2521344, E-Mail: ceg@cegroupindia.com</p>	<p>ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE</p>	<p>SITE PLAN BRIDGE AT PROPOSED CH. 3+241.0 (MIRJAPUR VILLAGE)</p>	<p>Checked by: _____ Date: _____</p> <p>Reviewed by: _____ Date: _____</p> <p>Approved by: _____ Date: _____</p>
	<p>PROJECT</p>	<p>SCALE</p>	<p>DATE</p>



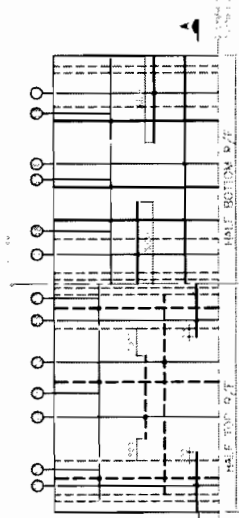
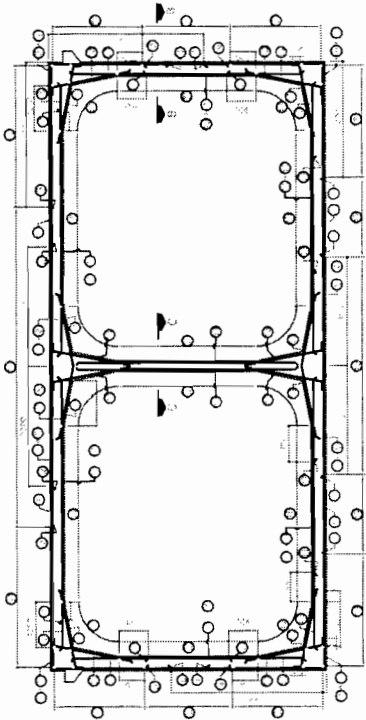


**NOTES:**

1. All dimensions are in meters unless otherwise specified.  
 2. The reinforcement shall be as shown in the drawings.  
 3. The concrete shall be of grade M20.  
 4. The steel shall be of grade Fe 415.  
 5. The reinforcement shall be provided as per the drawings.  
 6. The reinforcement shall be provided as per the drawings.  
 7. The reinforcement shall be provided as per the drawings.  
 8. The reinforcement shall be provided as per the drawings.  
 9. The reinforcement shall be provided as per the drawings.  
 10. The reinforcement shall be provided as per the drawings.

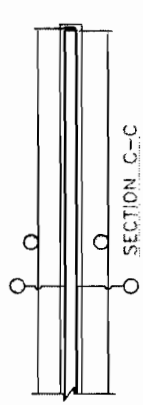
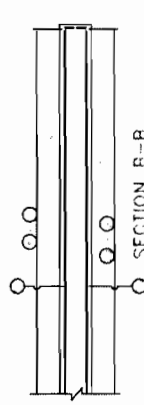
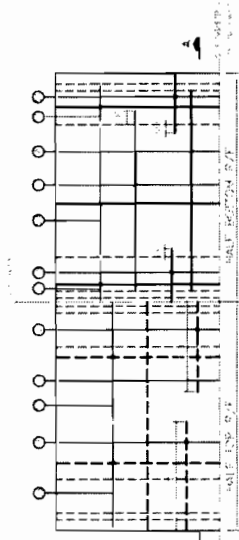
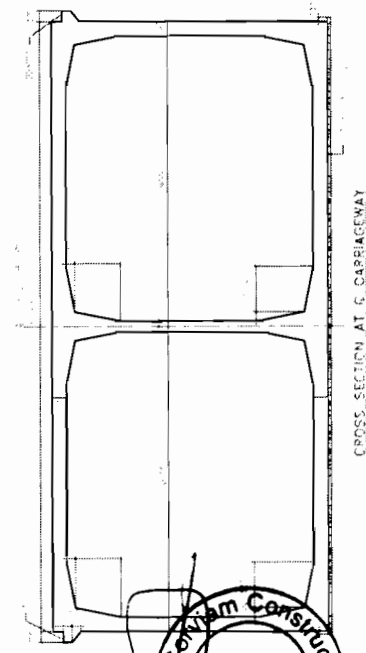
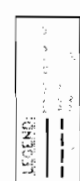
**REFERENCE DRAWINGS:**

1. IS: 456-1978 (Revised 2000) - Code of Practice for Plain and Reinforced Concrete Structures.  
 2. IS: 800-1984 - Specification for Structural Steel.  
 3. IS: 1786-1983 - Specification for Reinforcing Bars.  
 4. IS: 13920-1994 - Specification for Prestressing Concrete Reinforcing Bars.



**REINFORCEMENT DETAILS**

BAR NO.	BAR DIA.	SPACING	START
1	12	150	100
2	12	150	100
3	12	150	100
4	12	150	100
5	12	150	100
6	12	150	100
7	12	150	100
8	12	150	100
9	12	150	100
10	12	150	100
11	12	150	100
12	12	150	100
13	12	150	100
14	12	150	100
15	12	150	100
16	12	150	100
17	12	150	100
18	12	150	100
19	12	150	100
20	12	150	100
21	12	150	100
22	12	150	100
23	12	150	100
24	12	150	100
25	12	150	100
26	12	150	100
27	12	150	100
28	12	150	100
29	12	150	100
30	12	150	100



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

**DIMENSION AND REINFORCEMENT DETAILS  
BRIDGE AT PROPOSED CH. 3+862  
(HALADIHA BYPASS)**

<p><b>C E C</b></p>	<p><b>CONSULTING ENGINEERS GROUP LTD.</b>                  E-17/18, Sector-10, Gurgaon, Haryana                  Tel: 011-49611411-2200894, 2321894, 2320509                  Fax: 2320348, e-mail: cep@engineersgroup.com</p>	<p><b>PROJECT:</b></p>
<p><b>CONTRACTOR:</b></p>	<p><b>Corsan Corviam Construccion S.A.</b></p>	<p><b>DATE:</b></p>
<p><b>DESIGNED BY:</b></p>	<p><b>Checked by:</b></p>	<p><b>DATE:</b></p>
<p><b>DESIGNED BY:</b></p>	<p><b>Checked by:</b></p>	<p><b>DATE:</b></p>
<p><b>DESIGNED BY:</b></p>	<p><b>Checked by:</b></p>	<p><b>DATE:</b></p>

NOTES: -

TO CHANDBALI

PROPOSED NEW TWO LANE  
BRIDGE AT KM 3+862.0  
SPAN 2x8.0 M  
CELL SKEW ANGLE 0°

ALLIDI VILLAGE

ALLIDI VILLAGE

JUNCTION AT CH. 3950  
REF. DWG. No. -OSRP/CEG/JN/03

SITE PLAN

DESIGNED BY :	DATE :	SCALE :
CHECKED BY :	DATE :	SCALE :
APPROVED BY :	DATE :	SCALE :

SITE PLAN  
BRIDGE AT PROPOSED CH. 3+862  
(HALADIPA BYPASS)

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

CONSULTING  
ENGINEERS GROUP LTD.  
E-12, (A) Colony, Malabar Nagar, Jaipur-17  
Tel: 877-141 - 252000, 2521800, 2520058  
Fax: 2521348, E-mail: ceg@cegroup.com

**Corsan Corviam Construction S.A.**  
BHADARK

CHARGE: BUREAU  
DATE: 14/08/03  
SITE: 14/08/03  
DWG. NO: OSRP/CEG/BB-02

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

NOTES:

1. The bridge is to be constructed on the existing ground level. The ground level is to be maintained throughout the length of the bridge.

2. The bridge is to be constructed on the existing ground level. The ground level is to be maintained throughout the length of the bridge.

3. The bridge is to be constructed on the existing ground level. The ground level is to be maintained throughout the length of the bridge.

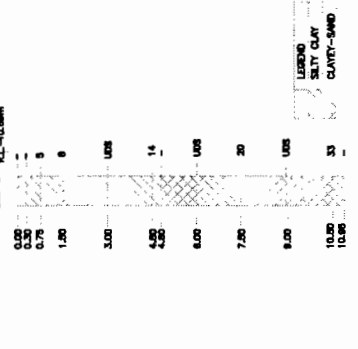
4. The bridge is to be constructed on the existing ground level. The ground level is to be maintained throughout the length of the bridge.

5. The bridge is to be constructed on the existing ground level. The ground level is to be maintained throughout the length of the bridge.

REFERENCE DRAWINGS:

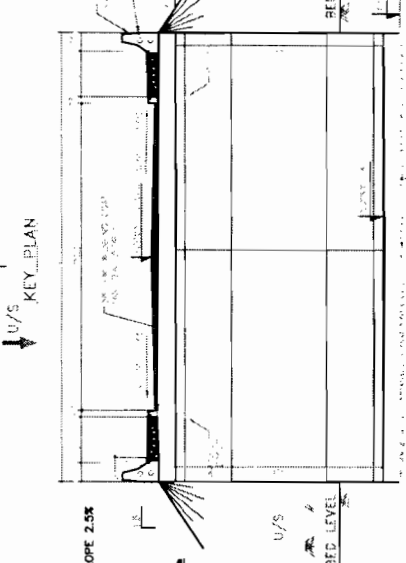
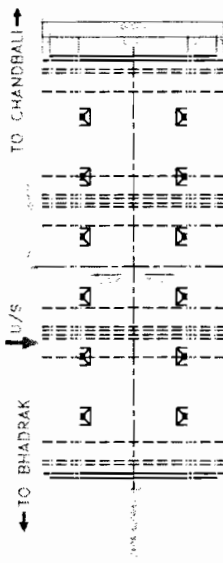
1. General Arrangement Drawing  
 2. Bridge at Proposed Ch. 6+096 (Kala Polo)

LOCATION PLAN OF BRIDGE AT PROPOSED CH. 6+096



BOX LEVELS DETAILS

Span	Span Length (m)	Span Type	Span Material	Span Support
1	10.00	Box Girder	RC	Abutment
2	10.00	Box Girder	RC	Pier
3	10.00	Box Girder	RC	Pier
4	10.00	Box Girder	RC	Abutment



NOTE:

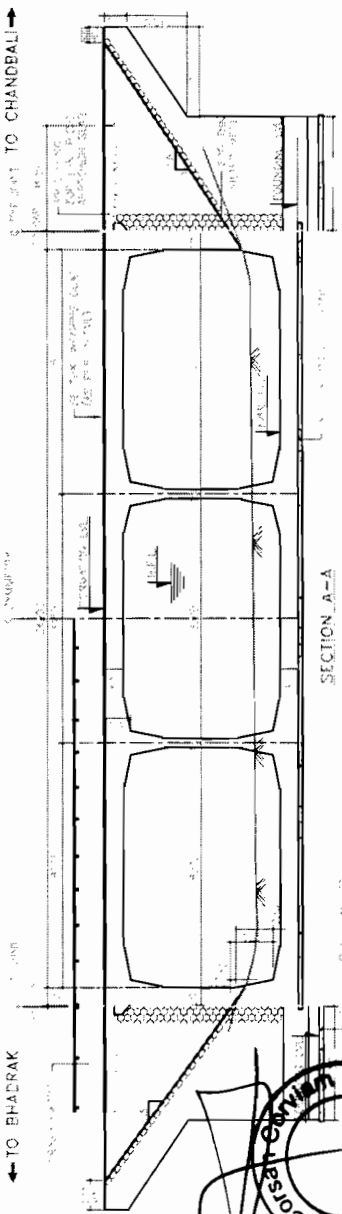
1. The bridge is to be constructed on the existing ground level. The ground level is to be maintained throughout the length of the bridge.

2. The bridge is to be constructed on the existing ground level. The ground level is to be maintained throughout the length of the bridge.

3. The bridge is to be constructed on the existing ground level. The ground level is to be maintained throughout the length of the bridge.

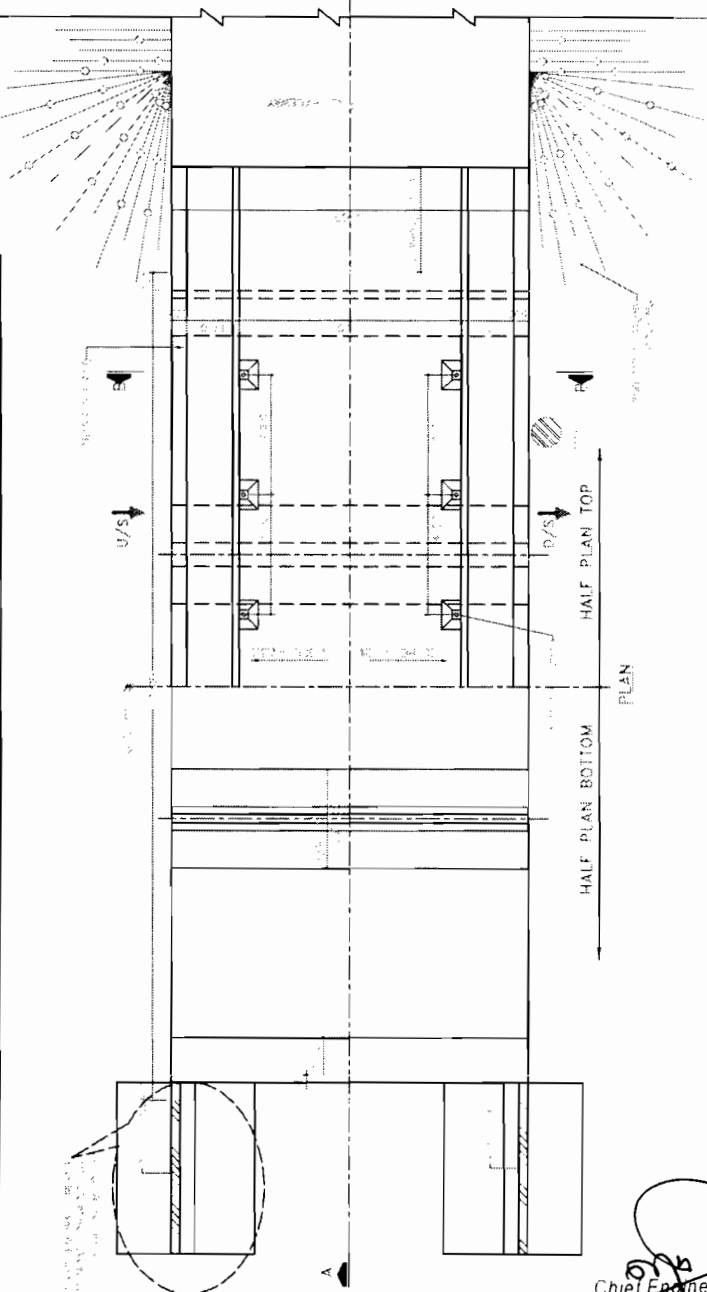
4. The bridge is to be constructed on the existing ground level. The ground level is to be maintained throughout the length of the bridge.

5. The bridge is to be constructed on the existing ground level. The ground level is to be maintained throughout the length of the bridge.



BOX LEVELS DETAILS

Span	Span Length (m)	Span Type	Span Material	Span Support
1	10.00	Box Girder	RC	Abutment
2	10.00	Box Girder	RC	Pier
3	10.00	Box Girder	RC	Pier
4	10.00	Box Girder	RC	Abutment



GENERAL ARRANGEMENT DRAWING  
 BRIDGE AT PROPOSED CH. 6+096  
 (KALA POLO)

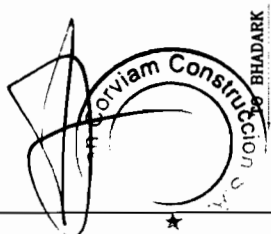
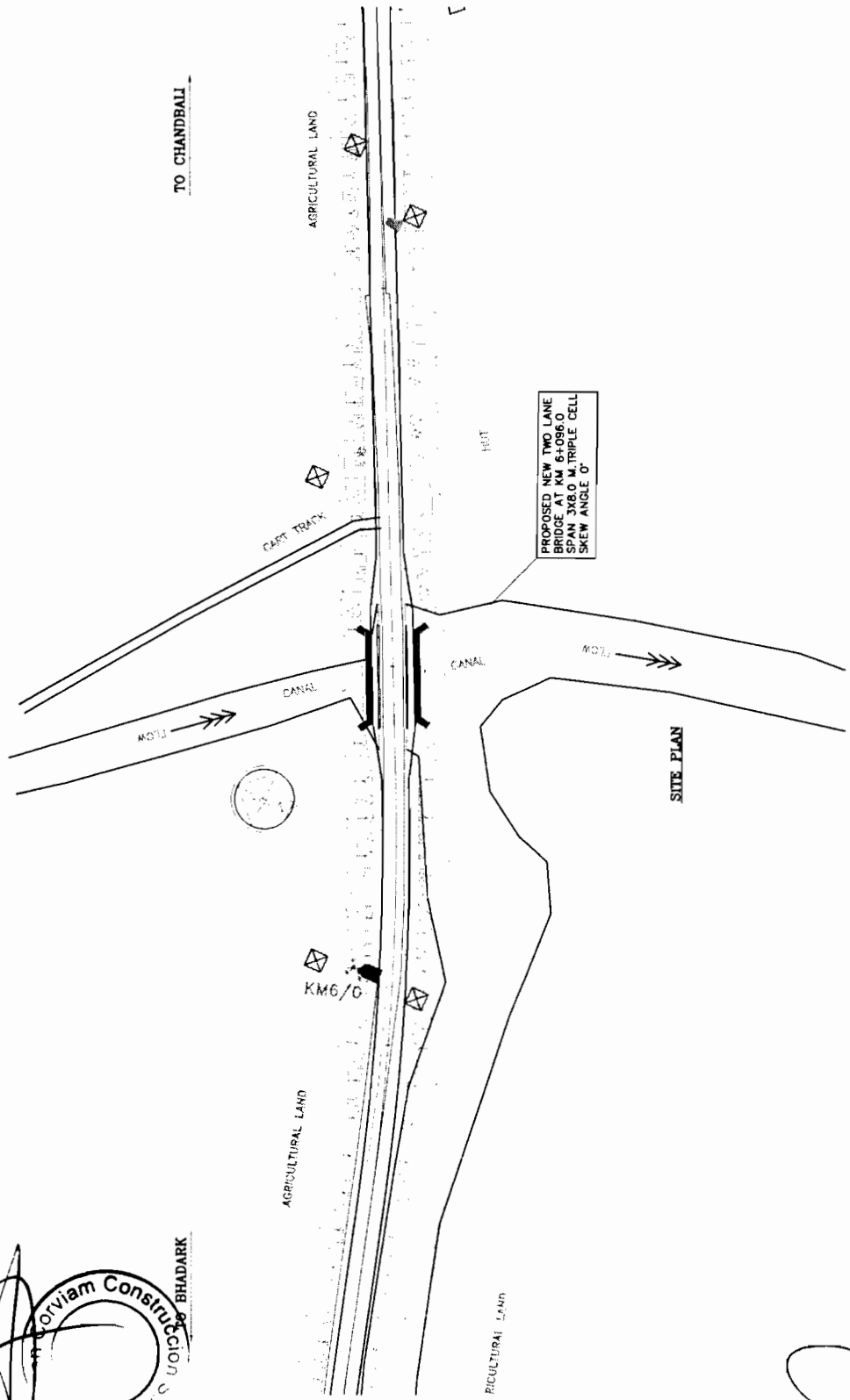
NO.	DATE	BY	CHKD.	APPD.
1	12/01/2011	...	...	...
2	12/01/2011	...	...	...
3	12/01/2011	...	...	...
4	12/01/2011	...	...	...
5	12/01/2011	...	...	...

CONSULTANCY SERVICES FOR FEASIBILITY STUDY AND DETAILED PROJECT PREPARATION OF PHASE - (I) ROADS FOR ORISSA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE

CONSULTING ENGINEERS GROUP LTD.  
 PROJECT ENGINEER  
 O/o the Engineer-in-Charge,  
 Bhubaneswar.



NOTES:-



PROJECT NO. : CORVIA/CLP/14/00000000
DATE : 05/2013
ISSUED BY : [Signature]
CHECKED BY : [Signature]
APPROVED BY : [Signature]
SCALE :

**SITE PLAN**  
BRIDGE AT PROPOSED CH. 6+096  
(KALA POLO)

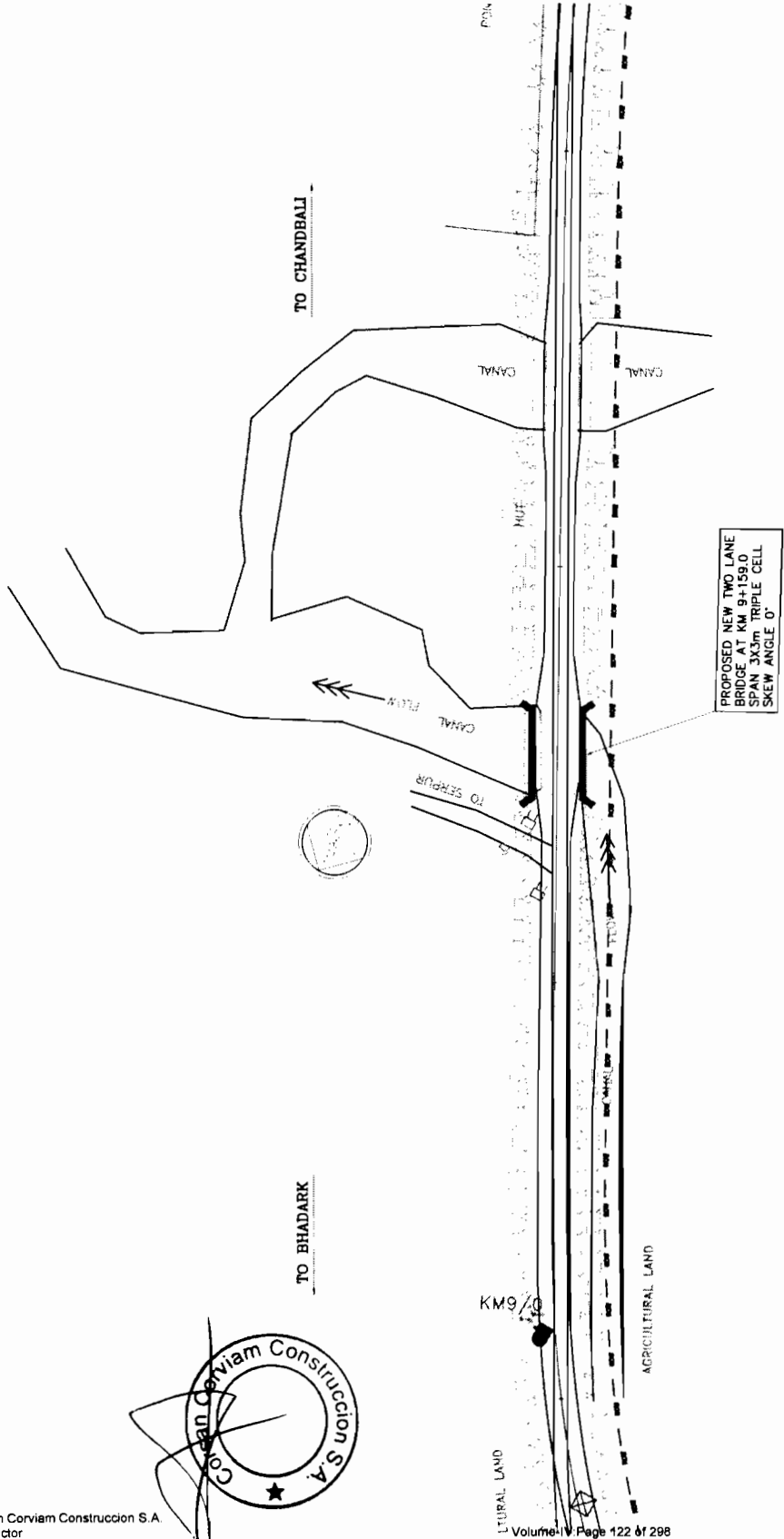
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

CONSULTING  
ENGINEERS GROUP LTD.  
Plot No. 17  
Sector 10, Bhubaneswar  
Tel: 811-41-230288, 2527889, 2527890  
Fax: 2521340, E-mail: ceg@egp.co.in

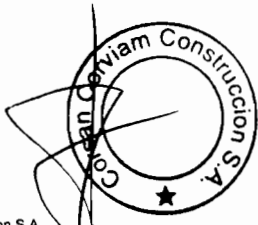
[Signature]



NOTES:-



SITE PLAN



KM 9/0

Chief Engineer,  
World Bank Project  
Odisha  
Bhubaneswar.

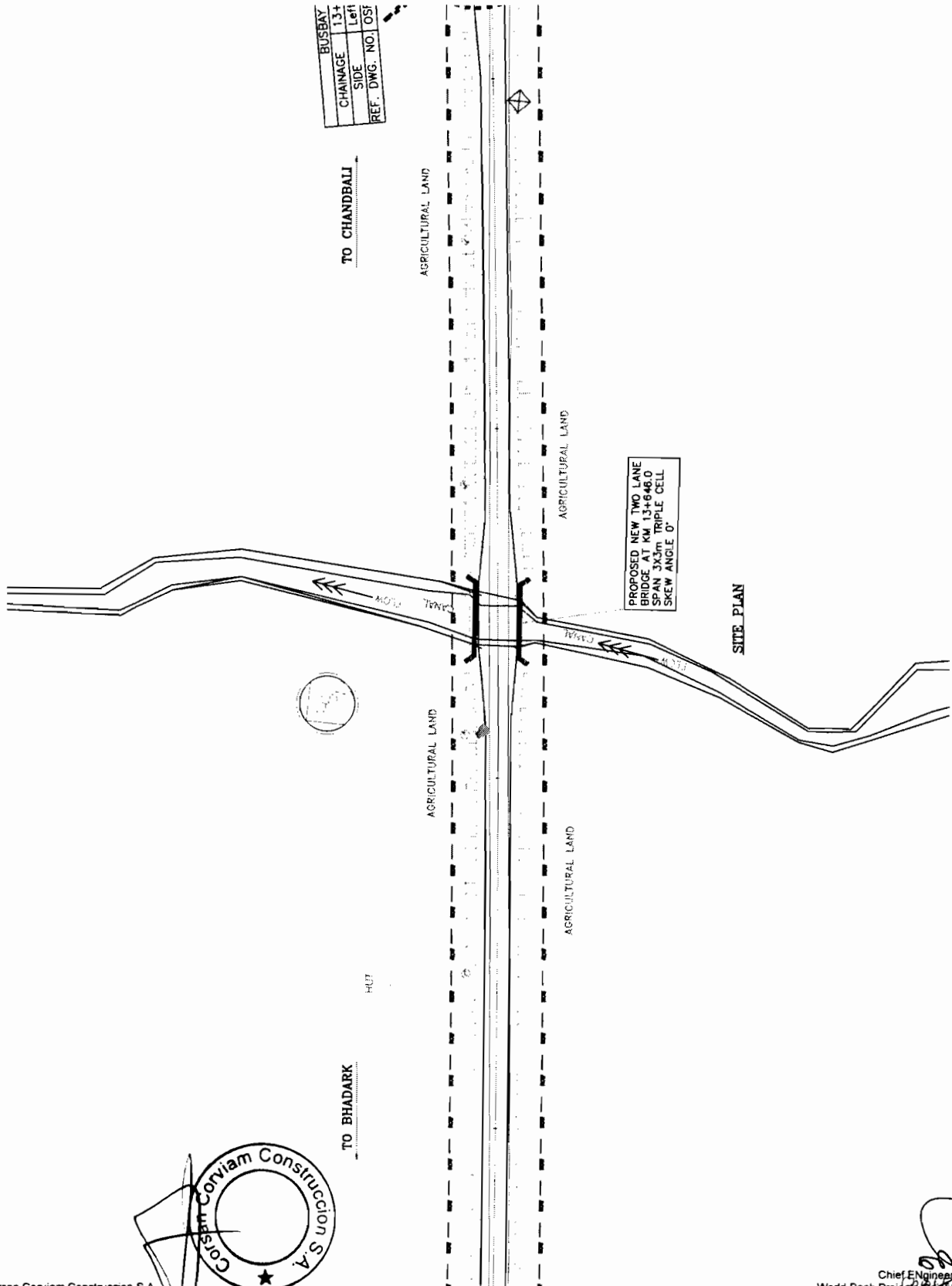
*[Handwritten Signature]*

<p>CONSULTING ENGINEERS GROUP LTD. E-12, 1st Floor, Colony, Bhubaneswar, Odisha India. Ph: 2571148, E-Mail: ceg@cegroupindia.com</p>	<p>PROJECT: ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE</p>	<p>SITE PLAN</p>	
		<p>BRIDGE AT PROPOSED CH. 9+159 (KUNDI POLO-1)</p>	
<p>DATE: 10/01/2012</p>	<p>SCALE: 1:1000</p>	<p>DATE: 10/01/2012</p>	<p>SCALE: 1:1000</p>





NOTES:-



BUSBAY	
CHAINAGE	13+
SIDE	Left
REF. DWG. NO.	OSP

PROPOSED NEW TWO LANE  
BRIDGE AT KM 13+646.0  
SPAN 3X3m TRIPLE CELL  
SKEW ANGLE 0°

SITE PLAN

PROJECT:

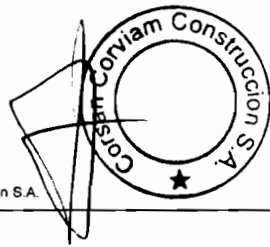
CONSULTING  
ENGINEERS GROUP LTD  
17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100

INDEX PLAN

BRIDGE AT PROPOSED CH. 13+646  
(NANDAPUR POLO)

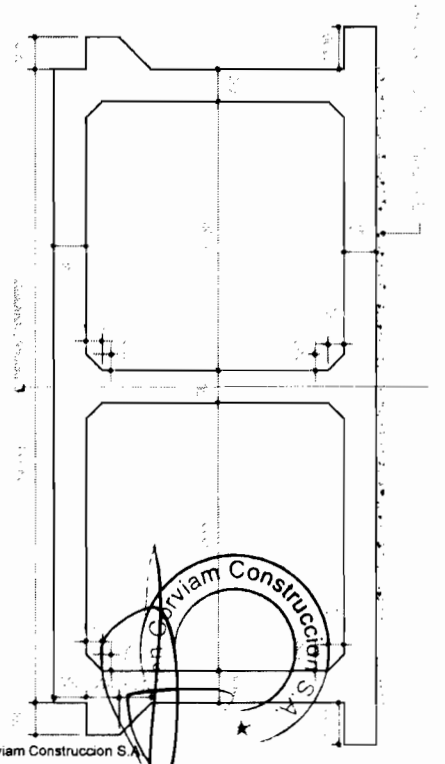
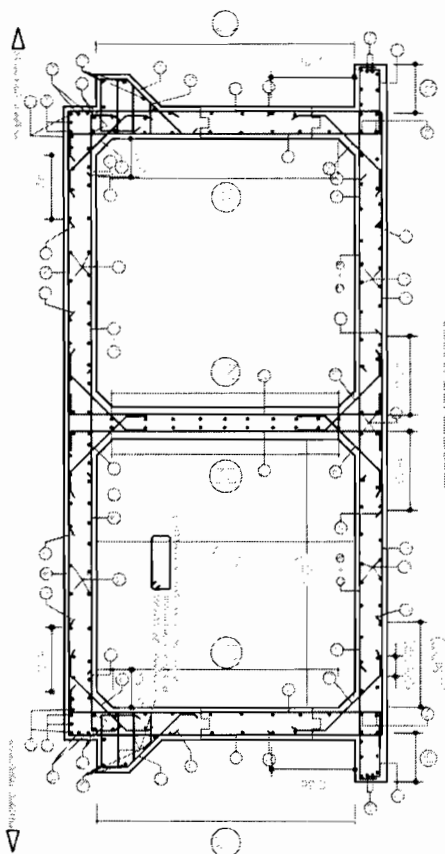
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

DATE	NO.	BY	DATE	NO.	BY	DATE	NO.	BY





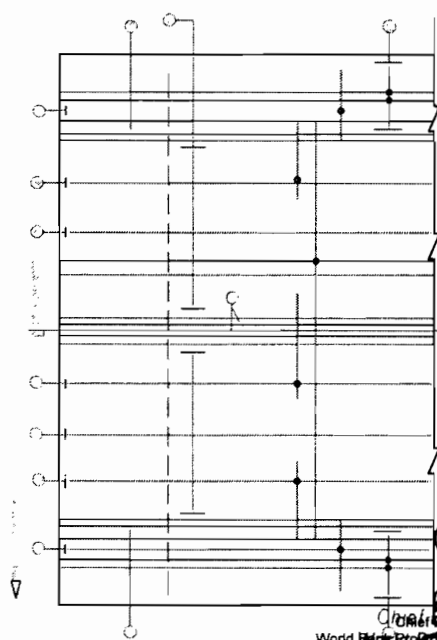
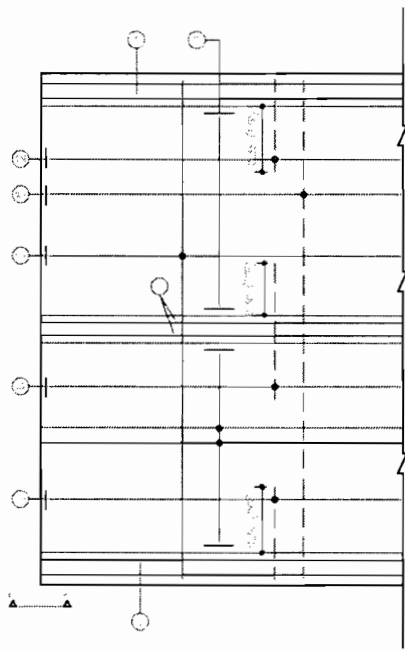
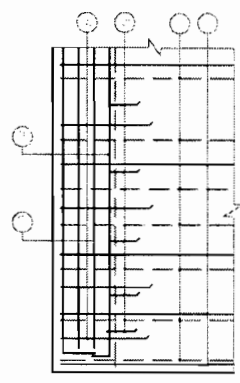
REFERENCE DRAWING:-



Corsan Corviam Construcción S.A.  
Contractor

**REINFORCEMENT DETAIL OF DOUBLE CELL BOX**

BAR MARK	BAR SHAPE	BAR DIA.	SPACING
1	[Shape]	20	200
2	[Shape]	16	200
3	[Shape]	16	200
4	[Shape]	12	175
5	[Shape]	12	200
6	[Shape]	12	200
7	[Shape]	12	200
8	[Shape]	12	200
9	[Shape]	12	200
10	[Shape]	10	200
11	[Shape]	10	200
12	[Shape]	12	150
13	[Shape]	12	150
14	[Shape]	10	150
15	[Shape]	12	200
16	[Shape]	10	200
17	[Shape]	10	150
18	[Shape]	10	150
19	[Shape]	10	150
20	[Shape]	10	150
21	[Shape]	16	200
22	[Shape]	10	150



World Bank Project  
O/o the E.I.C.P.O., Odisha  
Bhubaneswar.

**REINFORCEMENT DETAIL OF DOUBLE CELL BOX**  
**BRIDGE AT PROPOSED CH. 28+168**

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

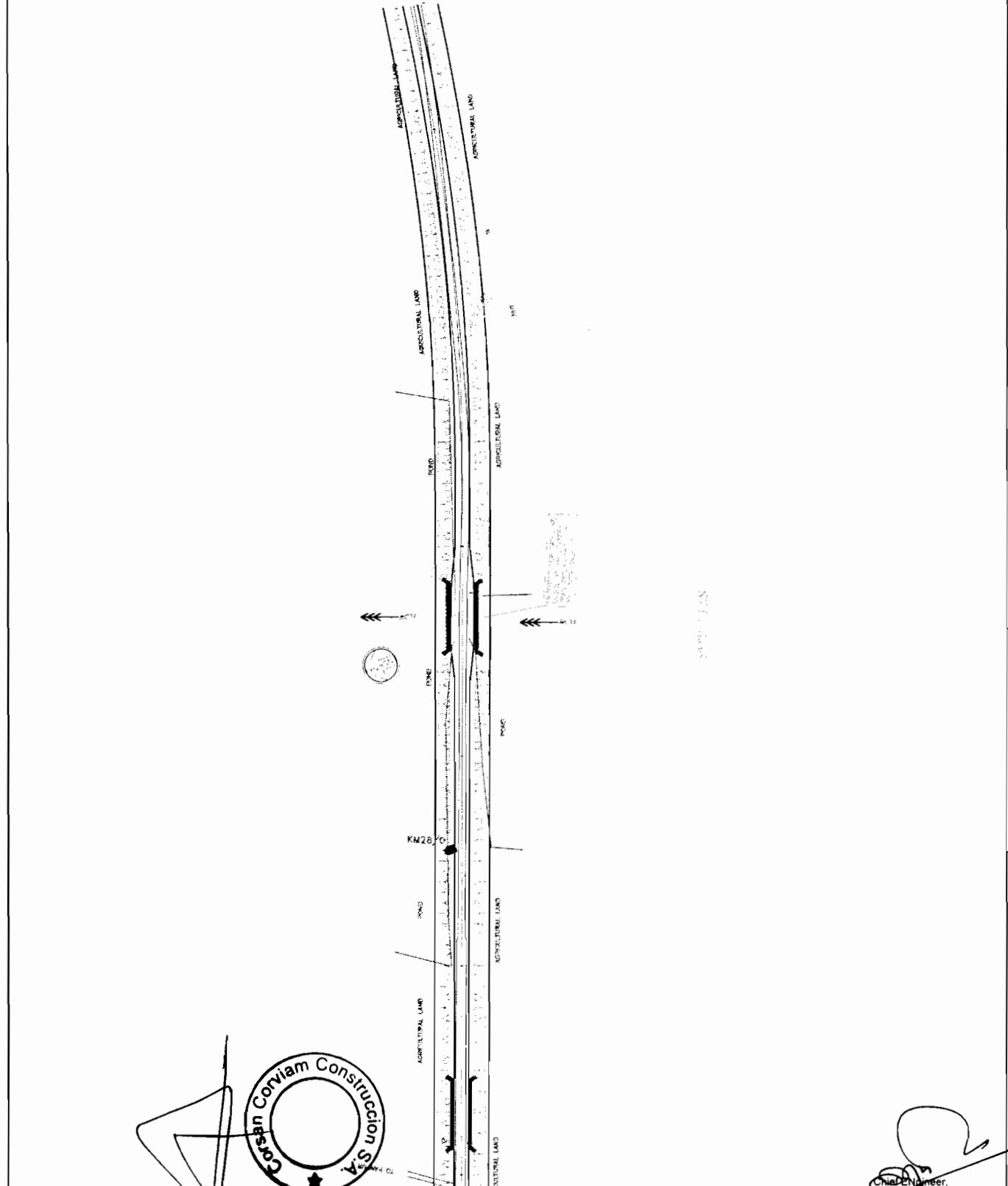
**CONSULTING ENGINEERS GROUP LTD.**  
E-12, Mid Colony, Mahara Nagar, Bhubaneswar-751004  
Tel: +91-674-2520099, 2521896, 2520558  
Fax: 2521340, e-mail: ceg@cegroupindia.com



PREPARED BY

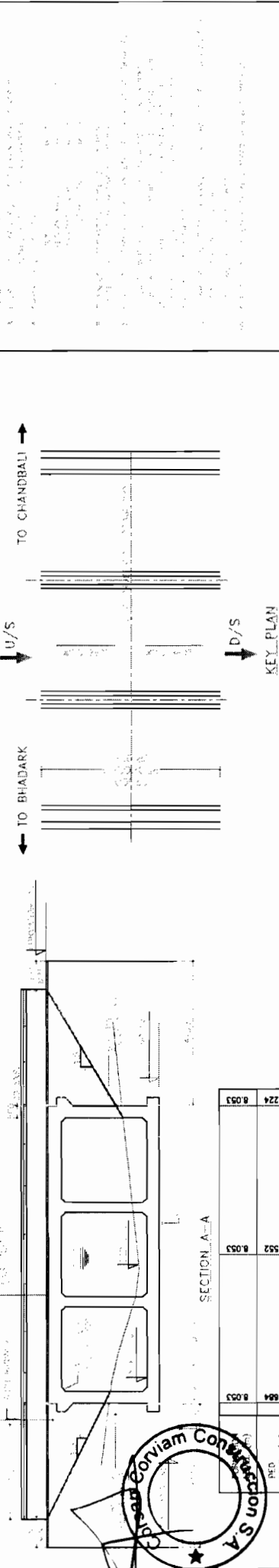
DESIGNED BY : CEG/200/04-01/01/01/100/018  
DATE : JULY 2013  
CHECKED BY :  
APPROVED BY :  
DATE :  
SCALE :  
SHEET NO. : 126

NOTES:

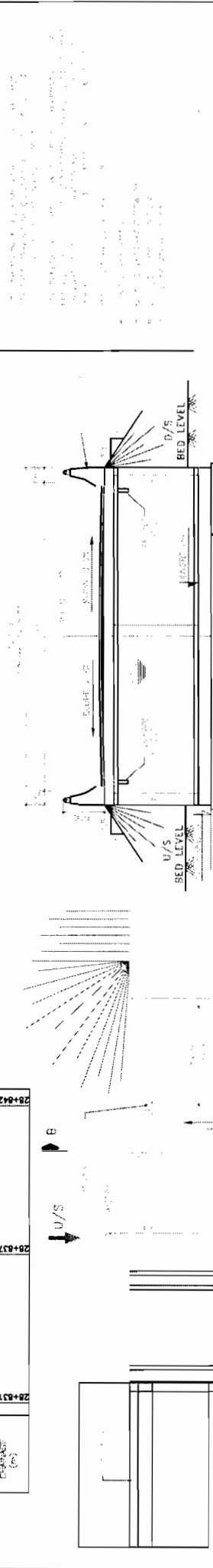


<p>PROJECTS</p> <p>ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE</p>	<p>SITE PLAN</p> <p>BRIDGE AT PROPOSED CH. 28+168</p>		<p>DATE: 11/05/2011</p>
	<p>DESIGNED BY</p> <p>CS</p>	<p>CHECKED BY</p> <p>CS</p>	<p>APPROVED BY</p> <p>CS</p>

NOTES:  
 1. The bridge shall be constructed in accordance with the specifications of the Government of Odisha.  
 2. The bridge shall be constructed on the existing ground level.  
 3. The bridge shall be constructed in accordance with the design data provided.

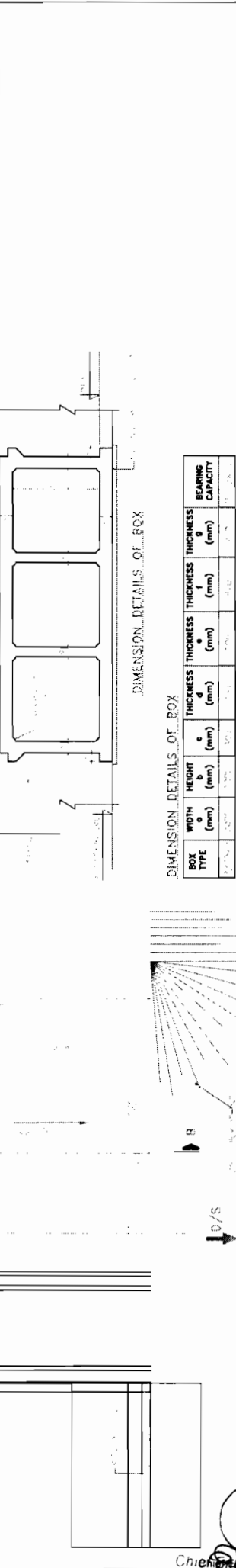


REFERENCE DRAWING:-



HYDROLOGICAL DATA

Design Discharge (cum/Sec)	u/s DCW <sub>1</sub>	d/s DCW <sub>2</sub>	u/s LRA <sub>1</sub>	d/s LRA <sub>2</sub>	Length of Rigid Apron in (mts)	Length of Flexible Apron in (mts)



BOX TYPE	WIDTH (mm)	HEIGHT (mm)	THICKNESS (mm)	a (mm)	b (mm)	c (mm)	d (mm)	e (mm)	BED LVL (m)	DESIGN HFL (m)	FORMATION LEVEL (m)	EXISTING PROPOSED LOCATION CHANGE (m)	INVERT LVL (m)	FOUNDING LVL (m)	LH (m)	H (m)	RH (m)	DIRECTION OF FLOW	
																			THICKNESS (mm)

GENERAL ARRANGEMENT DRAWING  
 BRIDGE AT PROPOSED CH. 28+837  
 (KALAPAHADA GHUSURA)

ODISHA STATE ROAD PROJECT  
 UNDER WORLD BANK ASSISTANCE

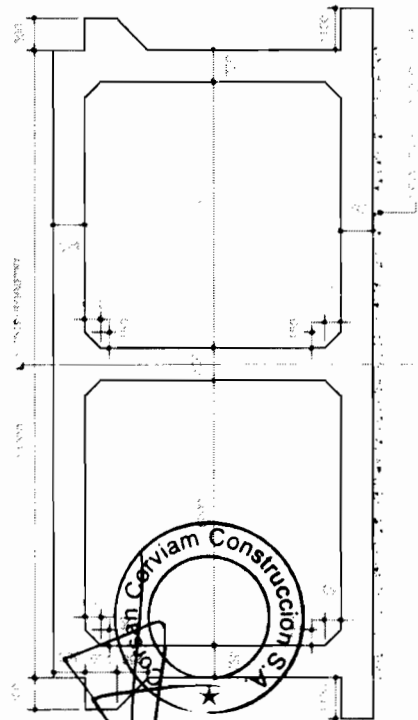
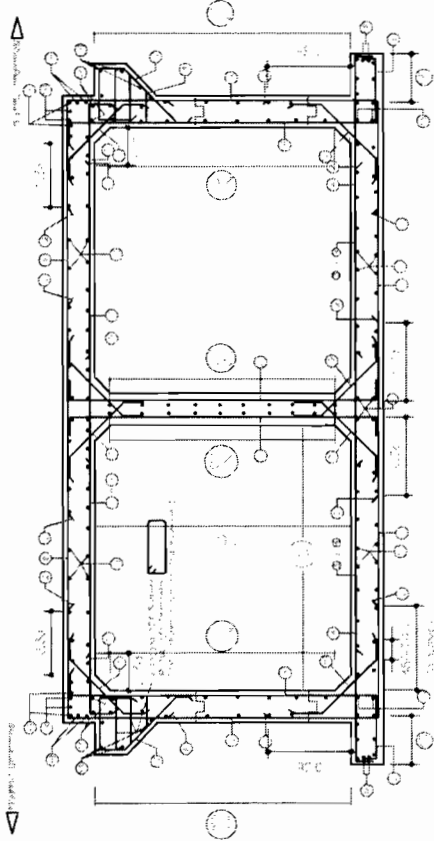
CONSULTING ENGINEERS GROUP LTD.  
 E-12/11, Odisha Market, Bhubaneswar-751005  
 Ph. 9301141, 2525882, 2525883, 2525884  
 Fax. 9301148, e-mail: engg@cegroup.com

Contractor: Corsan Corviam Construcco S.A.

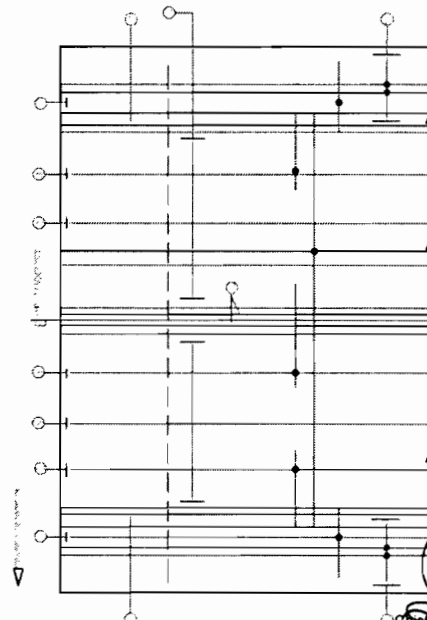
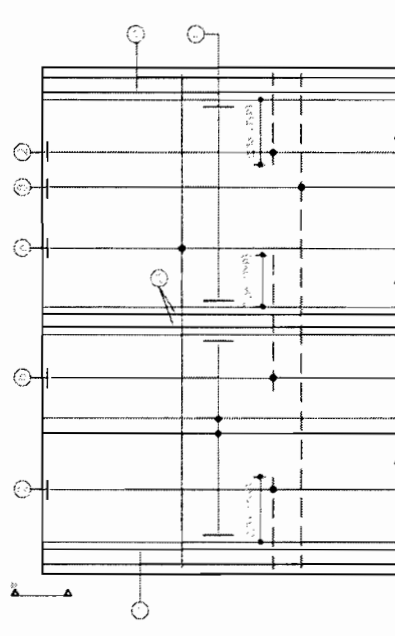
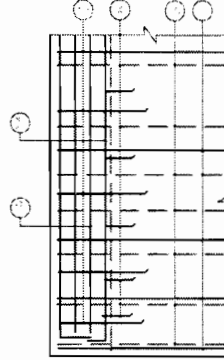
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Chief Engineer  
 O/o the E.I.C.(Civil), Odisha  
 Bhubaneswar.

REFERENCE DRAWING:-



REINFORCEMENT DETAIL OF DOUBLE CELL BOX



REINFORCEMENT DETAIL OF DOUBLE CELL BOX

BAR MARK	BAR SHAPE	BAR DIA	SPACING	L/MS/70
1	[Shape]	20	200	10
2	[Shape]	20	200	10
3	[Shape]	20	200	10
4	[Shape]	20	200	10
5	[Shape]	16	125	10
6	[Shape]	16	200	10
7	[Shape]	16	200	10
8	[Shape]	16	200	10
9	[Shape]	16	200	10
10	[Shape]	16	200	10
11	[Shape]	16	200	10
12	[Shape]	16	200	10
13	[Shape]	16	200	10
14	[Shape]	16	200	10
15	[Shape]	16	200	10
16	[Shape]	16	200	10
17	[Shape]	16	200	10
18	[Shape]	16	200	10
19	[Shape]	16	200	10
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21	[Shape]	16	200	10
22	[Shape]	16	200	10
23	[Shape]	16	200	10
24	[Shape]	16	200	10
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28	[Shape]	16	200	10
29	[Shape]	16	200	10
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32	[Shape]	16	200	10
33	[Shape]	16	200	10
34	[Shape]	16	200	10
35	[Shape]	16	200	10
36	[Shape]	16	200	10
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45	[Shape]	16	200	10
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48	[Shape]	16	200	10
49	[Shape]	16	200	10
50	[Shape]	16	200	10
51	[Shape]	16	200	10
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53	[Shape]	16	200	10
54	[Shape]	16	200	10
55	[Shape]	16	200	10
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57	[Shape]	16	200	10
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60	[Shape]	16	200	10
61	[Shape]	16	200	10
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63	[Shape]	16	200	10
64	[Shape]	16	200	10
65	[Shape]	16	200	10
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67	[Shape]	16	200	10
68	[Shape]	16	200	10
69	[Shape]	16	200	10
70	[Shape]	16	200	10
71	[Shape]	16	200	10
72	[Shape]	16	200	10
73	[Shape]	16	200	10
74	[Shape]	16	200	10
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89	[Shape]	16	200	10
90	[Shape]	16	200	10
91	[Shape]	16	200	10
92	[Shape]	16	200	10
93	[Shape]	16	200	10
94	[Shape]	16	200	10
95	[Shape]	16	200	10
96	[Shape]	16	200	10
97	[Shape]	16	200	10
98	[Shape]	16	200	10
99	[Shape]	16	200	10
100	[Shape]	16	200	10

REINFORCEMENT DETAIL OF DOUBLE CELL BOX

BRIDGE AT PROPOSED CH. 28+168

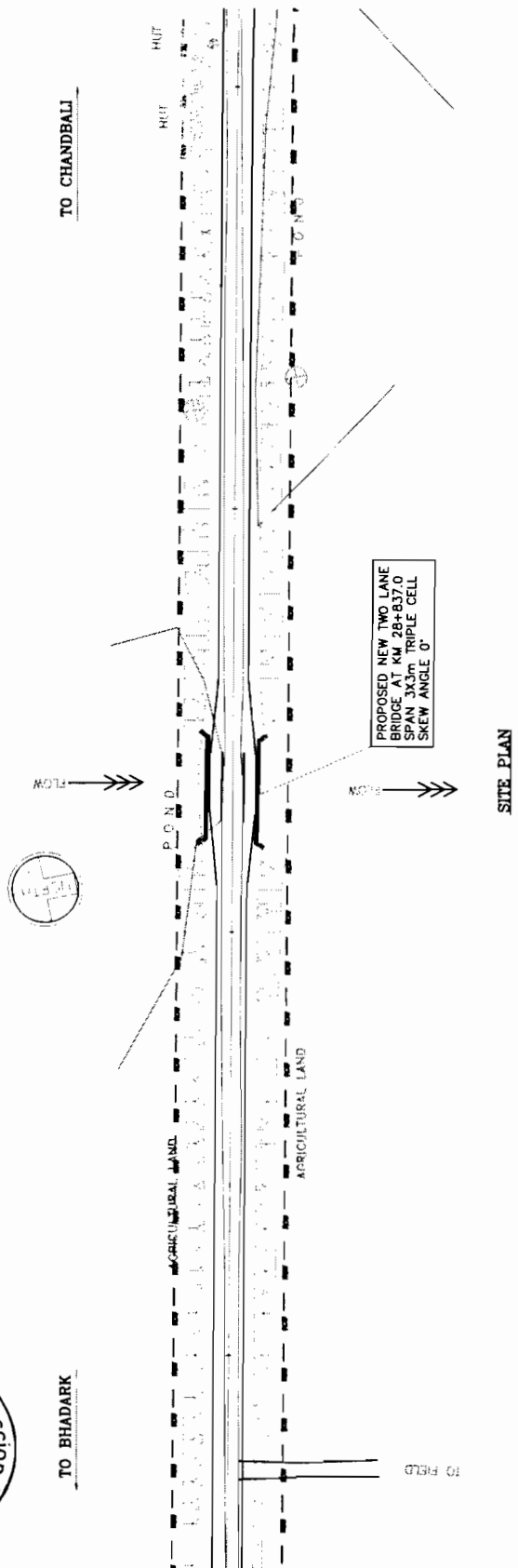
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

PROJEC

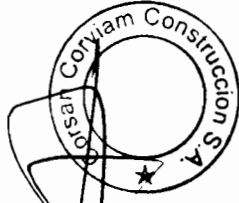
CONSULTING ENGINEERS GROUP LTD.  
E-12, 1st Floor, Colony, Jhalapour, Jaipur-302002  
Tel: 81-141-2520899, 2521898, 2520856  
Fax: 2521348, e-mail: ceg@cegindia.com



NOTES:-



SITE PLAN



Corsan Corviam Construction S.A.  
 Contractor

Chief Engineer,  
 World Bank Project Engineer

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

CONSULTING ENGINEERS GROUP LTD. E-12, 1st Floor, Colony, Market, Nagpur, Jalapur-17 Tel: +91-11-2320099, 2527099, 2320056 Fax: 2521294, E-mail: ceg@cegroup.com	SUBJECT: ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE	SITE PLAN BRIDGE AT PROPOSED CH. 26+837 (KALPAHADA GHUSURA)		DRAWING NO.: ODSR/ECG/SA/SP/01/0002 DATE: 28.01.2013
		CHECKED BY:	DESIGNED BY:	SCALE:

**NOTES:**

1. The structure shall be constructed as per the approved drawings and specifications.

2. The structure shall be constructed on a firm foundation.

3. The structure shall be constructed with good quality materials.

4. The structure shall be constructed in accordance with the latest standards and codes of practice.

5. The structure shall be constructed in accordance with the approved drawings and specifications.

6. The structure shall be constructed in accordance with the approved drawings and specifications.

7. The structure shall be constructed in accordance with the approved drawings and specifications.

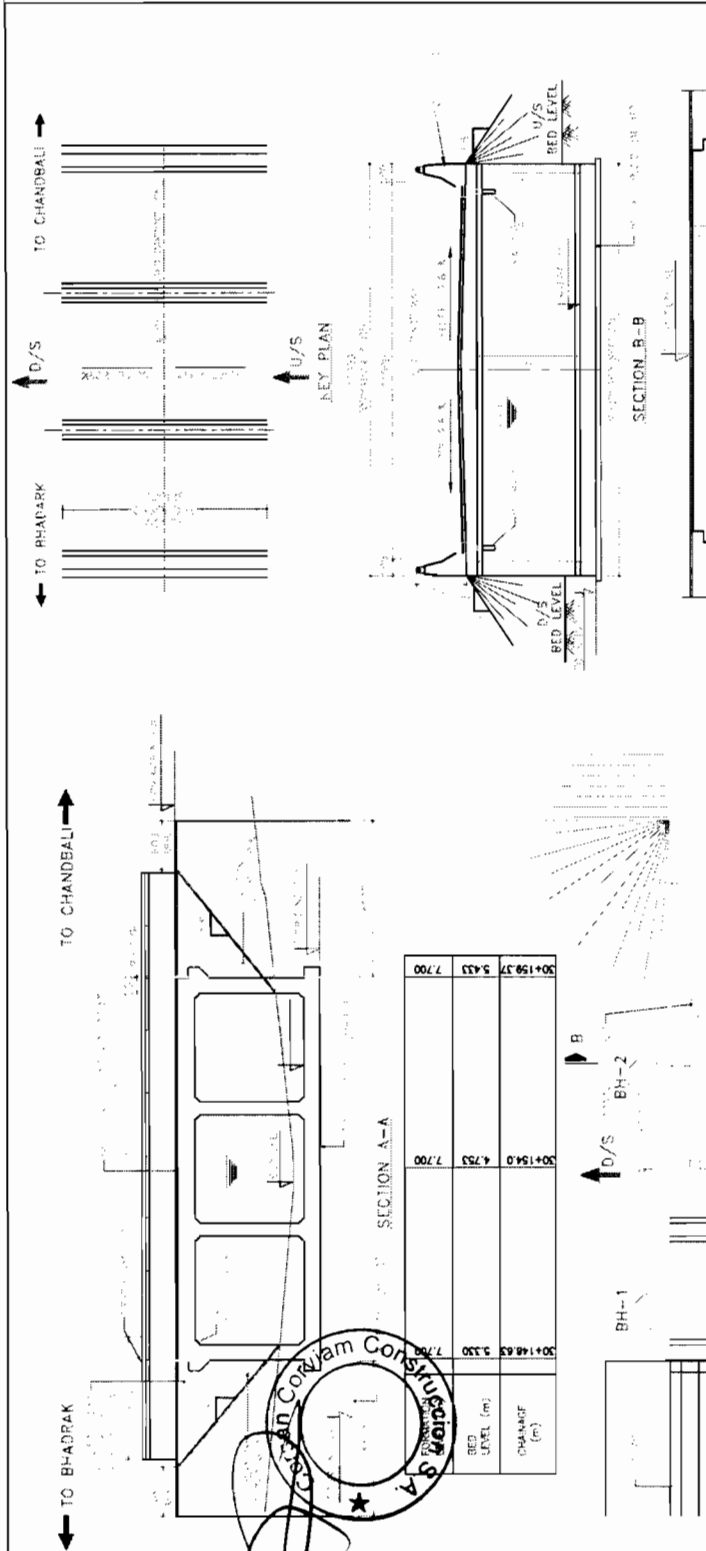
8. The structure shall be constructed in accordance with the approved drawings and specifications.

9. The structure shall be constructed in accordance with the approved drawings and specifications.

10. The structure shall be constructed in accordance with the approved drawings and specifications.

**REFERENCE DRAWING:-**

1. General Arrangement Drawing  
2. Bridge at Proposed Ch. 30+154  
(Gadi Ghusura)



**LOCATION PLAN OF BOXE HOLE AT BRIDGE 30.30/050**

BH-1	BH-2
8.50	8.50
1.00	1.00
3.00	3.00
4.00	4.00
6.00	6.00
7.00	7.00
8.00	8.00
10.00	10.00
12.00	12.00
13.00	13.00
15.00	15.00
15.00	15.00

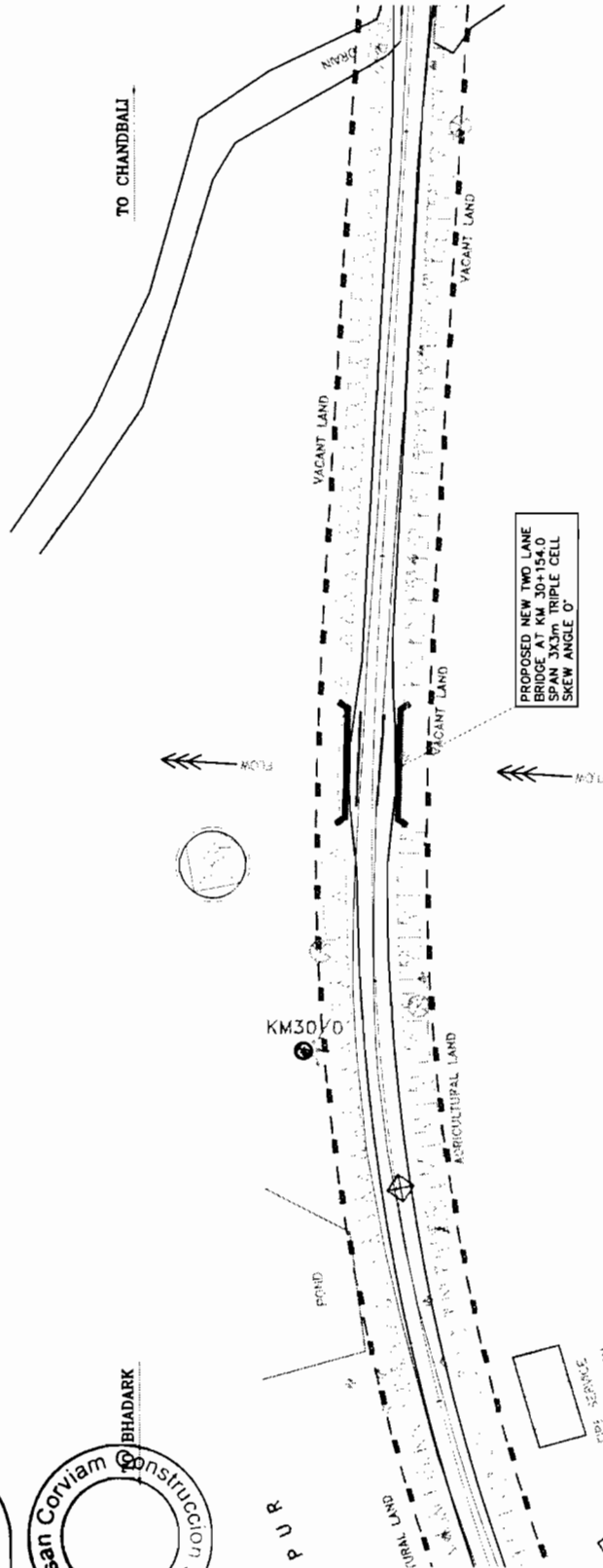
**GENERAL ARRANGEMENT DRAWING**  
BRIDGE AT PROPOSED CH. 30+154  
(GADI GHUSURA)

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

**CONSULTING ENGINEERS GROUP LTD.**  
15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, 143, 145, 147, 149, 151, 153, 155, 157, 159, 161, 163, 165, 167, 169, 171, 173, 175, 177, 179, 181, 183, 185, 187, 189, 191, 193, 195, 197, 199, 201, 203, 205, 207, 209, 211, 213, 215, 217, 219, 221, 223, 225, 227, 229, 231, 233, 235, 237, 239, 241, 243, 245, 247, 249, 251, 253, 255, 257, 259, 261, 263, 265, 267, 269, 271, 273, 275, 277, 279, 281, 283, 285, 287, 289, 291, 293, 295, 297, 299, 301, 303, 305, 307, 309, 311, 313, 315, 317, 319, 321, 323, 325, 327, 329, 331, 333, 335, 337, 339, 341, 343, 345, 347, 349, 351, 353, 355, 357, 359, 361, 363, 365, 367, 369, 371, 373, 375, 377, 379, 381, 383, 385, 387, 389, 391, 393, 395, 397, 399, 401, 403, 405, 407, 409, 411, 413, 415, 417, 419, 421, 423, 425, 427, 429, 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3849, 3851, 3853, 3855, 3857, 3859, 3861, 3863, 3865, 3867, 3869, 3871, 3873, 3875, 3877, 3879, 3881, 3883, 3885, 3887, 3889, 3891, 3893, 3895, 3897, 3



NOTES:-



PROPOSED NEW TWO LANE  
BRIDGE AT KM 30+154.0  
SPAN 33.3m TRIPLE CELL  
SKEW ANGLE 0°

SITE PLAN

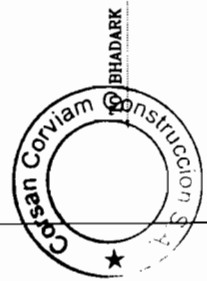
REVISION NO.	DATE	DESCRIPTION
1	20/05/2017	ISSUED FOR TENDER
2	20/05/2017	ISSUED FOR APPROVAL
3	20/05/2017	ISSUED FOR WORK

SITE PLAN  
BRIDGE AT PROPOSED CH. 30+154  
(GADI GHUSURA)

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

CONSULTING  
ENGINEERS GROUP LTD.  
E-12, Midy Colony, Mahapal Nagar, Jaipur-17  
Ph: 0141-2511141, 2511142, 2511143  
Fax: 0141-2511144, 2511145, 2511146

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



**NOTES:**

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.

2. THE BRIDGE SHALL BE CONSTRUCTED AS PER THE DETAILS SHOWN IN THIS DRAWING.

3. THE BRIDGE SHALL BE CONSTRUCTED AS PER THE DETAILS SHOWN IN THIS DRAWING.

4. THE BRIDGE SHALL BE CONSTRUCTED AS PER THE DETAILS SHOWN IN THIS DRAWING.

5. THE BRIDGE SHALL BE CONSTRUCTED AS PER THE DETAILS SHOWN IN THIS DRAWING.

6. THE BRIDGE SHALL BE CONSTRUCTED AS PER THE DETAILS SHOWN IN THIS DRAWING.

7. THE BRIDGE SHALL BE CONSTRUCTED AS PER THE DETAILS SHOWN IN THIS DRAWING.

8. THE BRIDGE SHALL BE CONSTRUCTED AS PER THE DETAILS SHOWN IN THIS DRAWING.

9. THE BRIDGE SHALL BE CONSTRUCTED AS PER THE DETAILS SHOWN IN THIS DRAWING.

10. THE BRIDGE SHALL BE CONSTRUCTED AS PER THE DETAILS SHOWN IN THIS DRAWING.

**REFERENCE DRAWINGS**

1. GENERAL ARRANGEMENT DRAWING NO. 32+100 (KALA POLO)

2. GENERAL ARRANGEMENT DRAWING NO. 32+100 (KALA POLO)

3. GENERAL ARRANGEMENT DRAWING NO. 32+100 (KALA POLO)

4. GENERAL ARRANGEMENT DRAWING NO. 32+100 (KALA POLO)

5. GENERAL ARRANGEMENT DRAWING NO. 32+100 (KALA POLO)

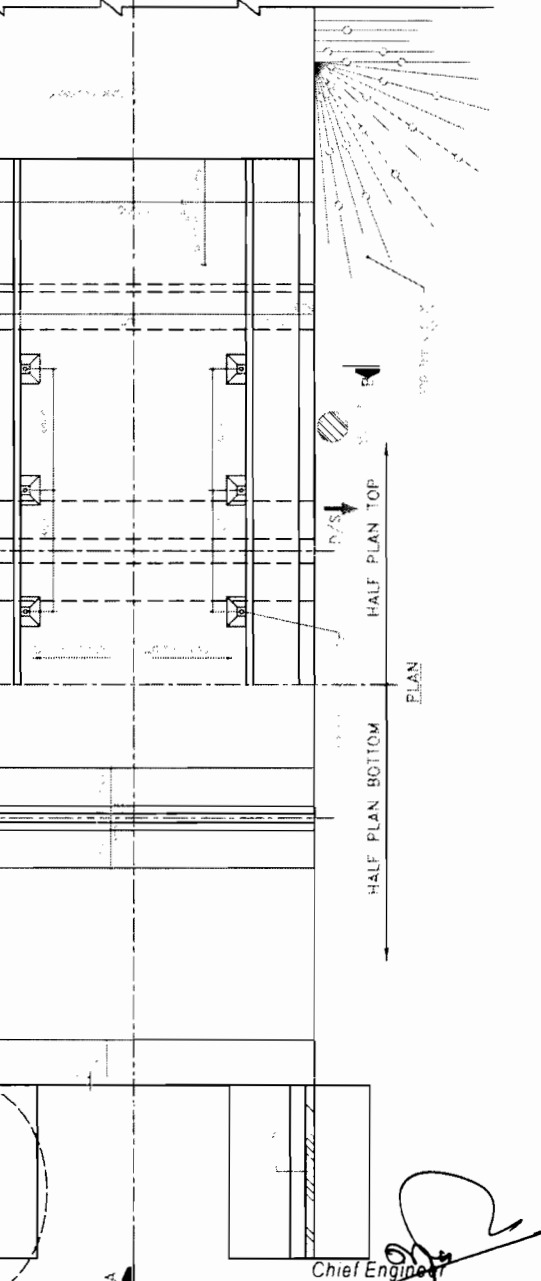
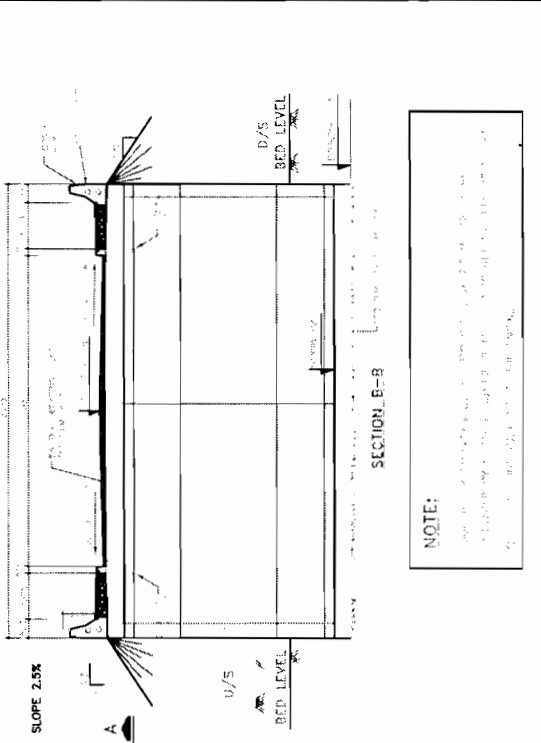
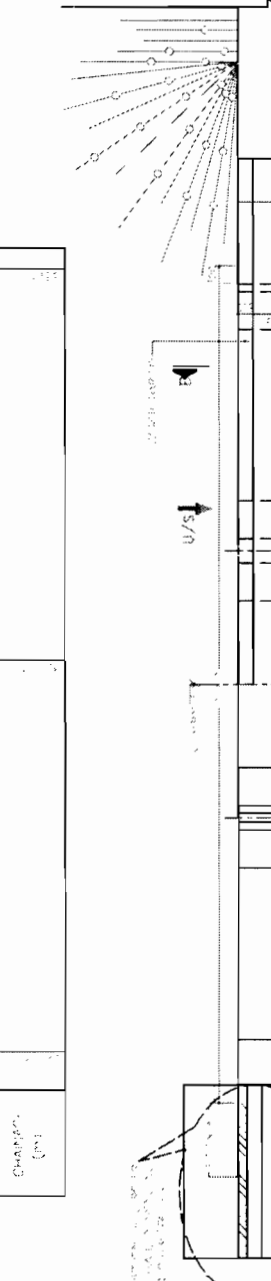
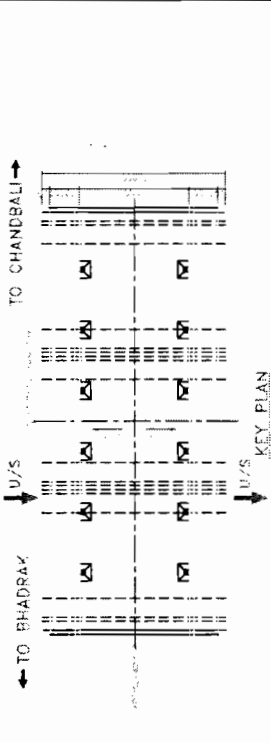
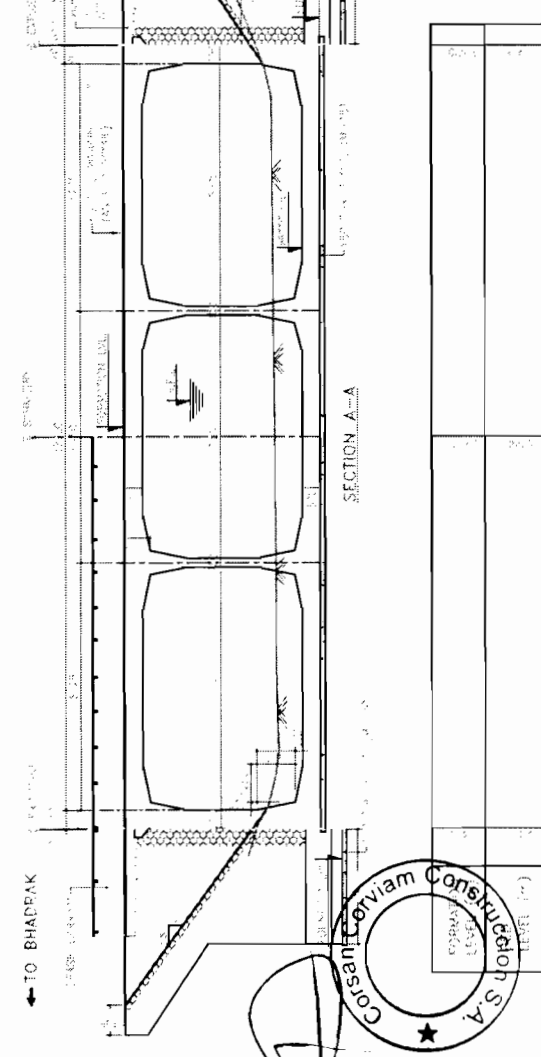
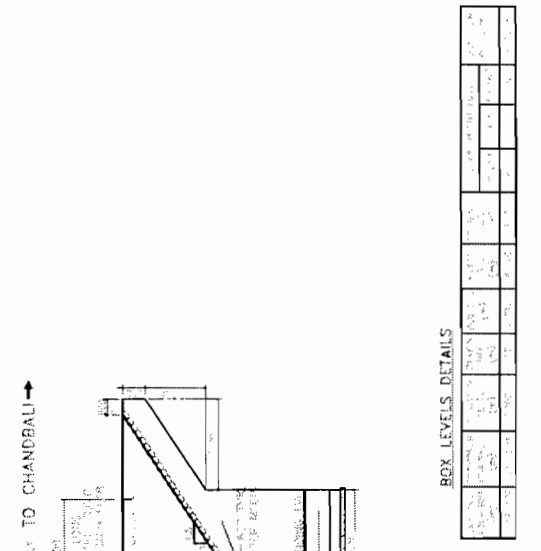
6. GENERAL ARRANGEMENT DRAWING NO. 32+100 (KALA POLO)

7. GENERAL ARRANGEMENT DRAWING NO. 32+100 (KALA POLO)

8. GENERAL ARRANGEMENT DRAWING NO. 32+100 (KALA POLO)

9. GENERAL ARRANGEMENT DRAWING NO. 32+100 (KALA POLO)

10. GENERAL ARRANGEMENT DRAWING NO. 32+100 (KALA POLO)



**BOX LEVELS DETAILS**

NO.	DESCRIPTION	LEVEL (m)
1	TOP SURFACE	10.00
2	TOP SURFACE	10.00
3	TOP SURFACE	10.00
4	TOP SURFACE	10.00
5	TOP SURFACE	10.00
6	TOP SURFACE	10.00
7	TOP SURFACE	10.00
8	TOP SURFACE	10.00
9	TOP SURFACE	10.00
10	TOP SURFACE	10.00

**CHANGING LEVEL (m)**

NO.	DESCRIPTION	LEVEL (m)
1	TOP SURFACE	10.00
2	TOP SURFACE	10.00
3	TOP SURFACE	10.00
4	TOP SURFACE	10.00
5	TOP SURFACE	10.00
6	TOP SURFACE	10.00
7	TOP SURFACE	10.00
8	TOP SURFACE	10.00
9	TOP SURFACE	10.00
10	TOP SURFACE	10.00

**NOTE:**

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.

2. THE BRIDGE SHALL BE CONSTRUCTED AS PER THE DETAILS SHOWN IN THIS DRAWING.

3. THE BRIDGE SHALL BE CONSTRUCTED AS PER THE DETAILS SHOWN IN THIS DRAWING.

4. THE BRIDGE SHALL BE CONSTRUCTED AS PER THE DETAILS SHOWN IN THIS DRAWING.

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8. THE BRIDGE SHALL BE CONSTRUCTED AS PER THE DETAILS SHOWN IN THIS DRAWING.

9. THE BRIDGE SHALL BE CONSTRUCTED AS PER THE DETAILS SHOWN IN THIS DRAWING.

10. THE BRIDGE SHALL BE CONSTRUCTED AS PER THE DETAILS SHOWN IN THIS DRAWING.

**GENERAL ARRANGEMENT DRAWING**

**BRIDGE AT PROPOSED CH. 32+100 (KALA POLO)**

DATE: 01/11/2011

DESIGNED BY: [Signature]

CHECKED BY: [Signature]

APPROVED BY: [Signature]

**ODISHA STATE ROAD PROJECT**

**UNDER WORLD BANK ASSISTANCE**

**CONSULTING ENGINEERS GROUP LTD.**

Plot No. 10, Sector 10, Gurgaon, Haryana

Ph: 01299-424343, 424344, 424345

Fax: 01299-424346, 424347, 424348

www.cogiltd.com

**Chief Engineer**

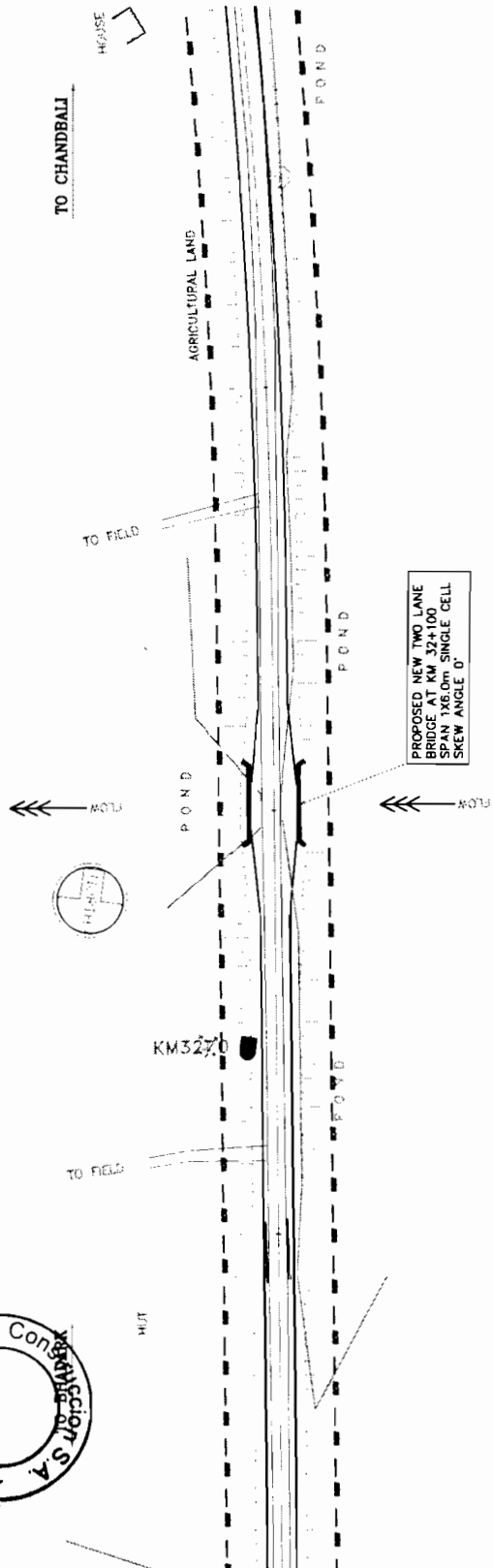
**World Bank Project**

**Odisha**

**Rhubaneswar**



NOTES:-



SITE PLAN

DESIGN NO. : ODP/PCO/01-14/102-1/0072
DATE : 01.01.2011
DESIGNED BY : [ ]
CHECKED BY : [ ]
APPROVED BY : [ ]

SITE PLAN  
BRIDGE AT PROPOSED CH. 32+100

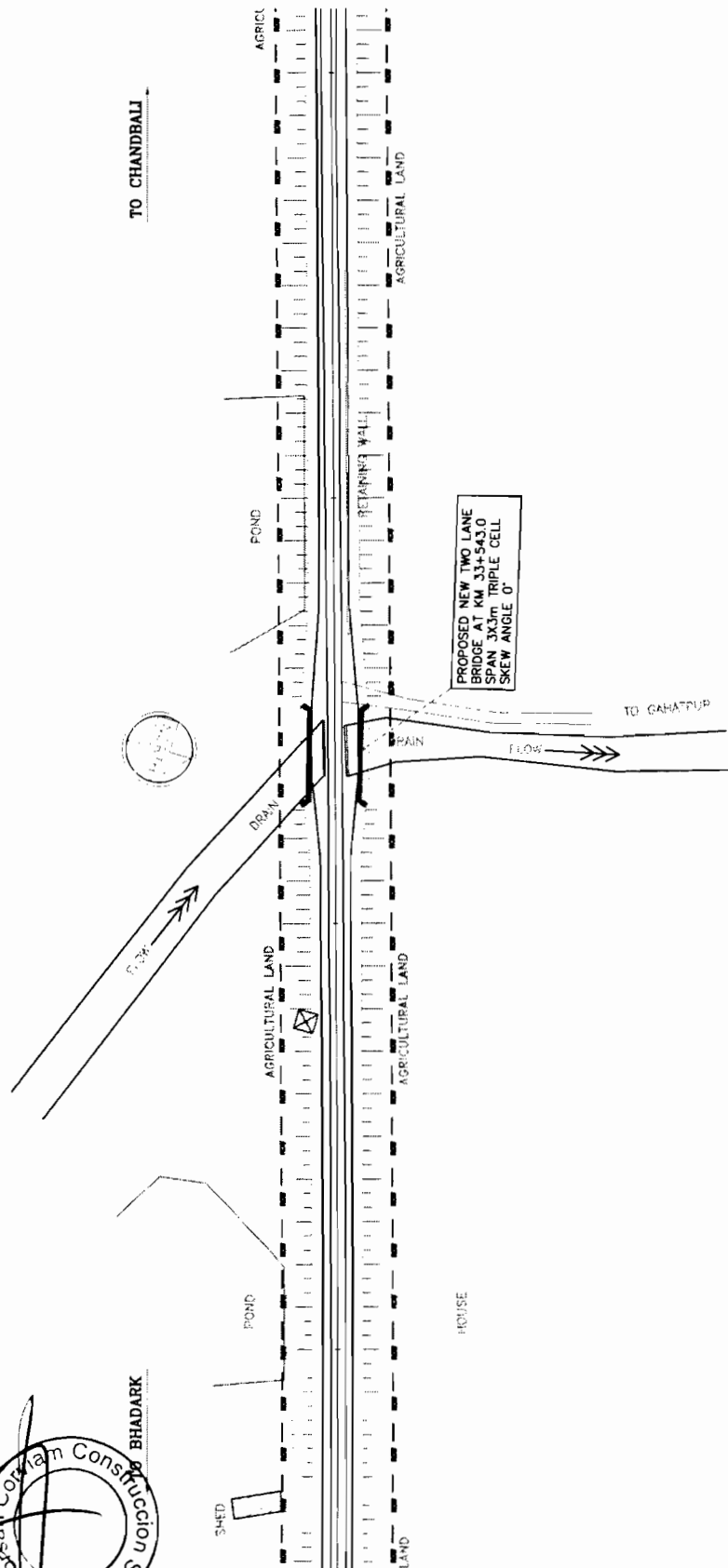
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

CONSULTING  
ENGINEERS GROUP LTD.  
E-12, 1st Colony, Bhubaneswar, Odisha-751006  
Ph: 2521141, 2520889, 2521888, 2520806  
Fax: 2521141, E-mail: engg@egroup.com

[ ] [ ] [ ] [ ]  
Chief Engineer



NOTES:-



SITE PLAN

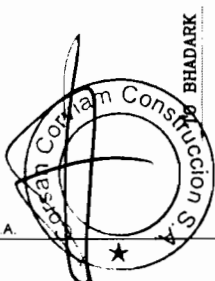
ISSUED NO. : 00000000000000000000	DATE : 00/00/00
NAME OF	ISSUED BY
CS	CS
CS	CS
CS	CS

SITE PLAN  
BRIDGE AT PROPOSED CH. 33+543

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

CONSULTING  
ENGINEERS GROUP LTD.  
E-7/46J Colony, Indraprastha, New Delhi-110058  
Ph: 2633348, E-mail: engg@egpld.com

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











NOTES:-

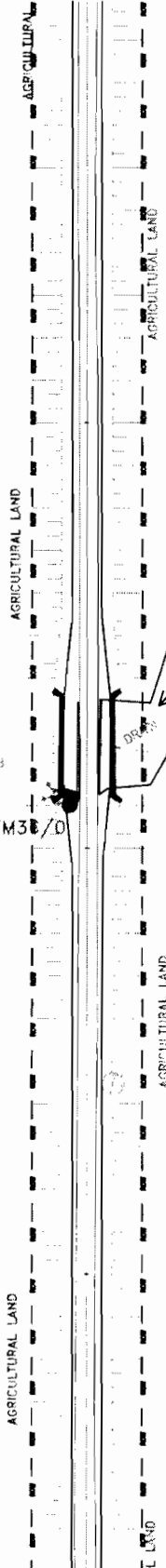
TO CHANDBALI

TO BHADARK



RM 7.3

KM 38.70



PROPOSED NEW TWO LANE  
BRIDGE AT KM 35+825.0  
SPAN 3x3m TRIPLE CELL  
SKEW ANGLE 0°

SITE PLAN

DATE / REV	DESIGNED BY	CHECKED BY	APPROVED BY

**SITE PLAN**  
BRIDGE AT KM 36+005  
(NALAGANDHA GHUSURA)

**PROJECT:**  
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

**CONSULTING ENGINEERS GROUP LTD.**  
E-12, 1st Floor, Colony, Mohana Nagar, Cuttack-751006  
Tel: +91-674-2520889, 2521899, 2520558  
Fax: 2521544, E-Mail: ceg@cegroupindia.com

**CONTRACTOR:**  
CORSAN CORVIAM CONSTRUCTION S.A.

**NOTES:**

1. THE PROPOSED BRIDGE SHALL BE CONSTRUCTED AS PER THE DETAILS SHOWN IN THIS DRAWING.

2. THE BRIDGE SHALL BE CONSTRUCTED ON THE EXISTING GROUND LEVEL.

3. THE BRIDGE SHALL BE CONSTRUCTED ON THE EXISTING GROUND LEVEL.

4. THE BRIDGE SHALL BE CONSTRUCTED ON THE EXISTING GROUND LEVEL.

5. THE BRIDGE SHALL BE CONSTRUCTED ON THE EXISTING GROUND LEVEL.

6. THE BRIDGE SHALL BE CONSTRUCTED ON THE EXISTING GROUND LEVEL.

7. THE BRIDGE SHALL BE CONSTRUCTED ON THE EXISTING GROUND LEVEL.

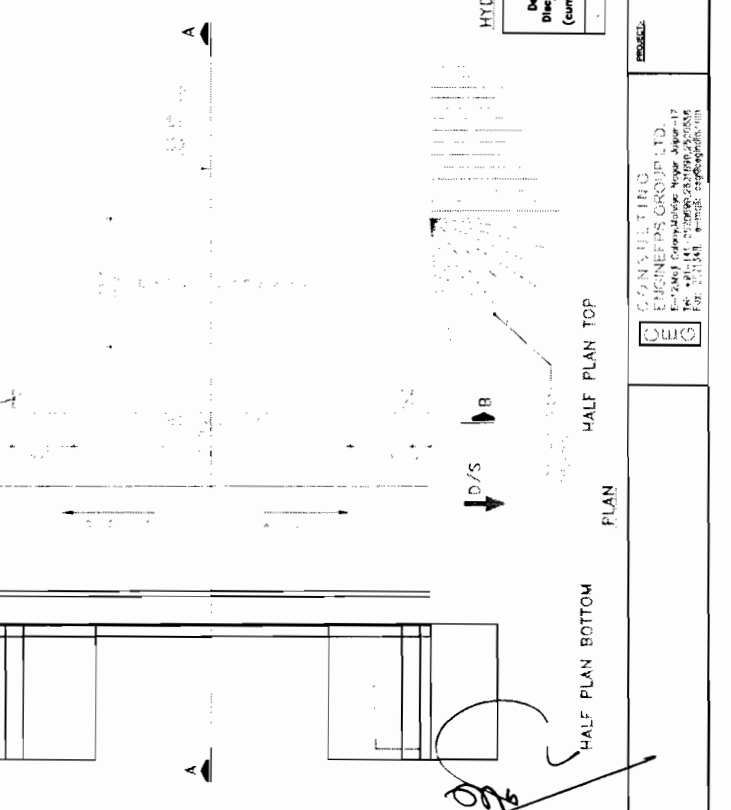
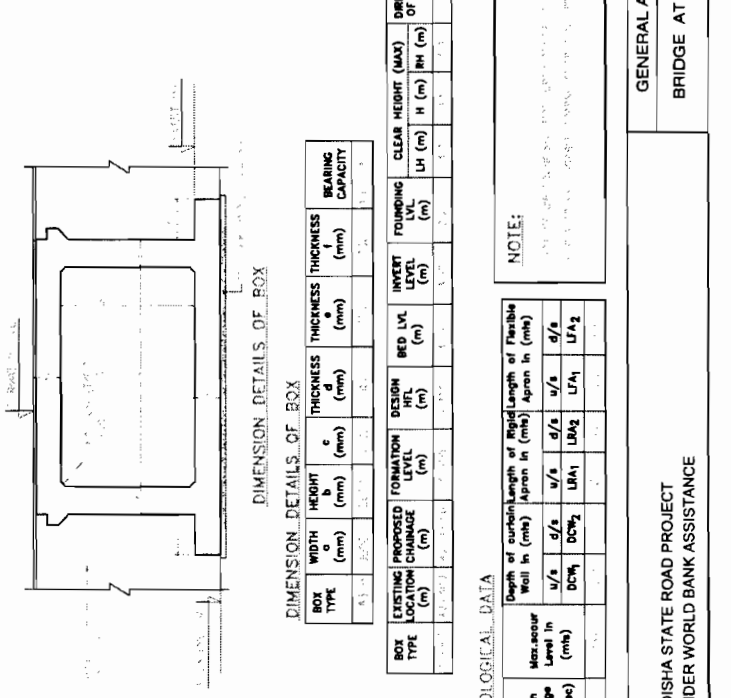
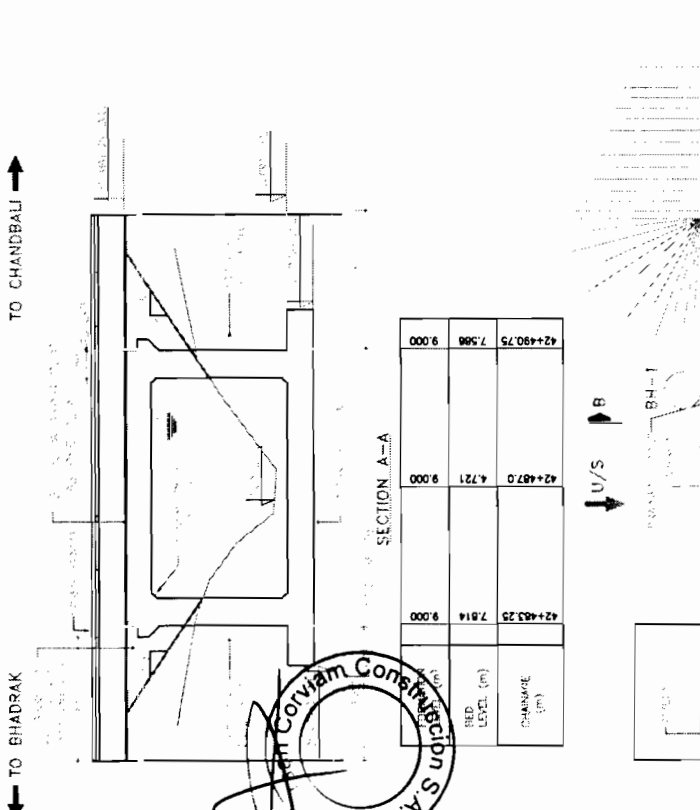
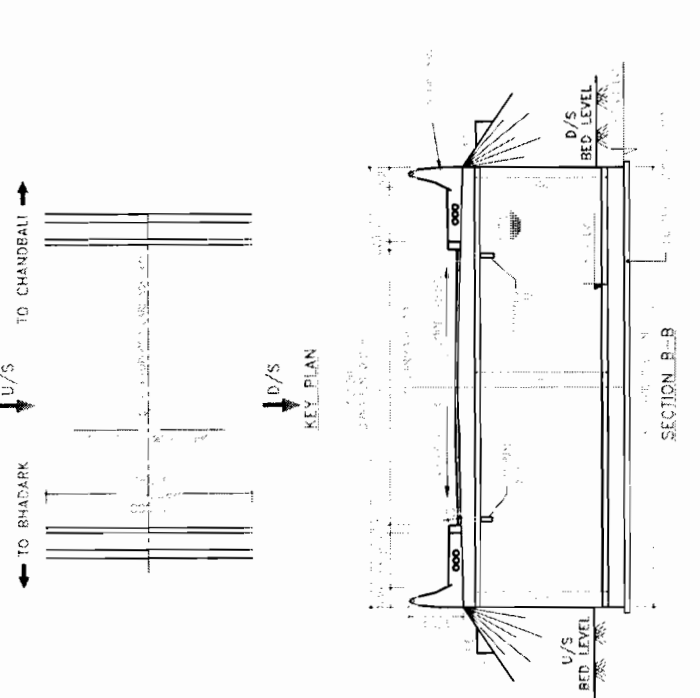
8. THE BRIDGE SHALL BE CONSTRUCTED ON THE EXISTING GROUND LEVEL.

9. THE BRIDGE SHALL BE CONSTRUCTED ON THE EXISTING GROUND LEVEL.

10. THE BRIDGE SHALL BE CONSTRUCTED ON THE EXISTING GROUND LEVEL.

**REFERENCE DRAWING:-**

1. GENERAL ARRANGEMENT DRAWING  
BRIDGE AT PROPOSED CH. 42+487.0



**LOCATION PLAN OF BRIDGE BOX AT BRIDGE NO.42/400**

BH-1	DEPTH (m)	SOIL TYPE
0.00	0.46	CLAYEY SILT
0.46	1.30	CLAYEY SILT
1.30	3.00	CLAYEY SILT
3.00	4.80	CLAYEY SILT
4.80	6.00	CLAYEY SILT
6.00	7.80	SILT CLAY
7.80	9.00	SILT CLAY
9.00	10.00	SILT CLAY
10.00	12.00	SILT CLAY
12.00	13.00	SILT CLAY
13.00	15.00	SILT CLAY
15.00	16.00	SILT CLAY

**DIMENSION DETAILS OF BOX**

BOX TYPE	WIDTH (mm)	HEIGHT (mm)	THICKNESS (mm)	THICKNESS (mm)	THICKNESS (mm)	BEARING CAPACITY
1	1500	1500	100	100	100	100

**HYDROLOGICAL DATA**

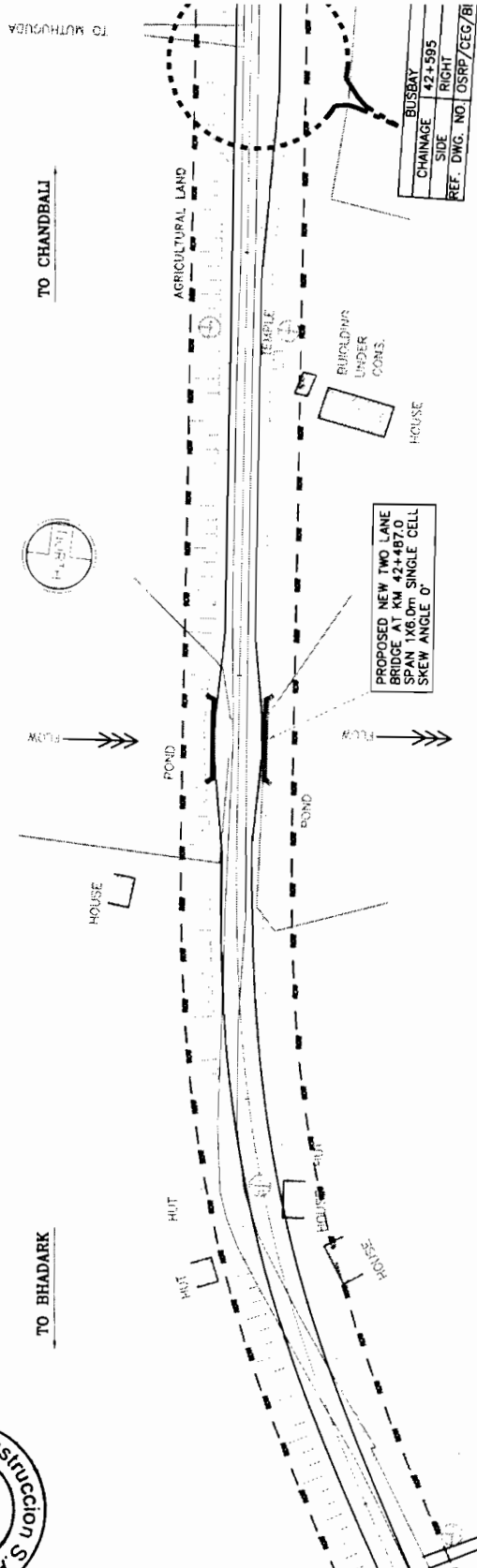
Design Discharge (cum/Sec)	Max. secure Level in (m/s)	Depth of submain (m)	Length of rigid apron (m)	Length of flexible apron (m)
100	100	100	100	100

**NOTE:**

1. THE BRIDGE SHALL BE CONSTRUCTED ON THE EXISTING GROUND LEVEL.

2. THE BRIDGE SHALL BE CONSTRUCTED ON THE EXISTING GROUND LEVEL.

NOTES:-



SITE PLAN

<p>CONSULTING ENGINEERS GROUP LTD. Odisha          E-12, 1st Floor, Colony, Bhubaneswar, Odisha          Ph: 2531144, E-mail: ceg@cegindia.com</p>		<p>ODISHA STATE ROAD PROJECT          UNDER WORLD BANK ASSISTANCE</p>	<p>PROJECT NO. OSRP/CEG/81</p>
<p>DATE: 17/08/2008</p>	<p>SCALE: 1:1000</p>	<p>SITE PLAN</p>	<p>BRIDGE AT PROPOSED CH. 42+487.0</p>





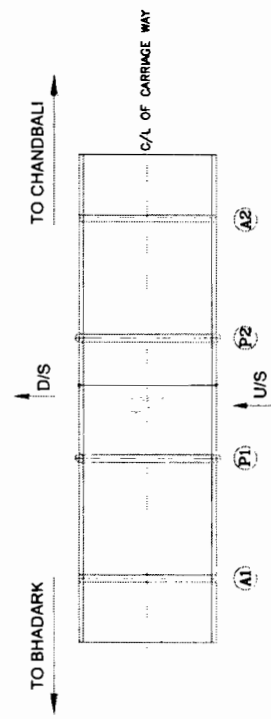
NOTES:

**EXISTING BRIDGE DETAILS**

1	Chainage	9+300
2	Name of the nallah	Kundi polo
3	Year of construction	1962-63
4	Type of bridge	High level Bridge
5	Existing span arrangement	3 x 7.0
6	Existing carriage way width	7.3 m
7	Thickness of superstructure	0.55 m
8	Type of foundation	Open Foundation
9	Type of substructure	Brick masonry wall type
10	Type of superstructure	RCC solid slab
11	Existing Formation Level	11.9 m
12	Final Formation Level	11.9 m
13	Bed Level	8.064 m
14	Distance of P.C.L. w.r.t. E.C.L.	0.03 m Right

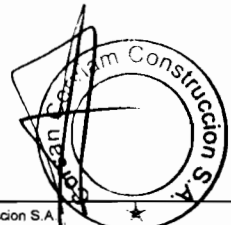
**REHABILITATION MEASURES SUGGESTED**

S. no.	Items	Rehabilitation Measures	Reference Drawings
1	Jacking	Jacking with dowels is suggested in piers and abutments	OSRP/CEG/BR/JT-01
2	Superstructure	Touch up repair to be done in the edge of slab (1.0 sq.m)	-
3	Expansion Joints	Expansion joint bonded due to overlay of BT and shall be replaced by asphaltic plug type	OSRP/CEG/BR/MISC-02
4	Wearing Coat	Existing Bituminous over lay shall be removed	OSRP/CEG/BR/MISC-02
5	Approach Slab	Approach slab to be constructed	OSRP/CEG/BR/MISC-02
6	Bed protection	Bed protection and curtain wall shall be provided	OSRP/CEG/SH-53 BR/FFW/02
7	Vegetation growth	Vegetations to be removed from the structure	-



**HYDROLOGICAL DATA**

Design Discharge in (cum/sec)	Max. scour Level in (mts)	Depth of curtain Wall in (mts)		Length of Rigid Apron in (mts)		Length of Flexible Apron in (mts)			
		u/s	d/s	DCW <sub>1</sub>	DCW <sub>2</sub>	u/s	d/s	LFA <sub>1</sub>	LFA <sub>2</sub>
10.0	11.0	2.0	2.0	2.0	2.0	2.0	2.0	6.0	6.0



Corsan Corviam Construccion S.A. Contractor

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

*[Handwritten Signature]*

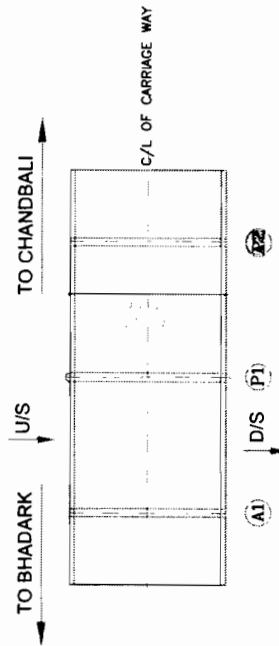
<p>CONSULTING ENGINEERS GROUP LTD B-12/13/14, Colony Market, Near, Vikas-17 Tel: +91-11-2520950, 2520951, 2520956 Fax: 2521345, e-mail: ceg@cegindia.com</p>		<p>PROJECT: ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE</p>	
<p>REHABILITATION BRIDGE DETAILS</p>		<p>BRIDGE AT KM. 9+300</p>	
<p>SHEET NO.: OSRP/CEG/SH-53 BR/FFW/02/VI</p>		<p>DATE: 11.01.2013</p>	
<p>DESIGNED BY: CES</p>	<p>CHECKED BY: CES</p>	<p>APPROVED BY: CES</p>	<p>DATE: CES</p>

NOTES:

EXISTING BRIDGE DETAILS	
1	Channage 30/200 Kadanga Canal
2	Name of the malth 1989
3	Year of construction High level Bridge
4	Type of bridge 2 x 6.7m
5	Existing span arrangement 7.35 m
6	Existing carriage way width 0.5 m
7	Thickness of superstructure Raft foundation
8	Type of foundation RCC box cell
9	Type of substructure RCC solid slab
10	Type of superstructure 7.7 m
11	Existing Formation Level 7.7 m
12	Final Formation Level 4.263 m
13	Bed Level 0.2 mt left
14	Distance of PCL w.r.t ECL

REHABILITATION MEASURES SUGGESTED			
S. no.	Items	Rehabilitation Measures	Reference Drawings
1	Expansion Joints	Expansion joint shall be replaced by asphalt plug type with approach slab	OSRP/CEGSH/BR/30-200/02
2	Railing	Existing railings to be dismantled and foot path shall be provided	OSRP/CEGSH/BR/30-200/02
3	Bed Protection	Bed protection shall be provided	OSRP/CEGSH/BR/30-200/02
4	Vegetation growth	Vegetations to be removed from the structure	OSRP/CEGSH/BR/30-200/02



KEY PLAN

HYDROLOGICAL DATA

Design Discharge in (cum/sec)	Max.scour Level in (mts)	Depth of curtain Wall in (mts)		Length of Rigid Apron in (mts)		Length of Flexible Apron in (mts)	
		u/s	d/s	u/s	d/s	u/s	d/s
		DCW <sub>1</sub>	DCW <sub>2</sub>	DCW <sub>1</sub>	DCW <sub>2</sub>	LFA <sub>1</sub>	LFA <sub>2</sub>

	CONSULTING ENGINEERS GROUP LTD. E-12/43, Gokulnagar, Nagar, Jaipur-37 Ph. 431-141-233993, 233994, 233766 Fax. 233136, e-mail: info@corian.com	ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE	REHABILITATION BRIDGE DETAILS BRIDGE AT KM. 30+200	SHEET NO.: OSRP/CEGSH/BR/30-200/01 DATE: 10.01.2011 DRAWN BY: [Signature] CHECKED BY: [Signature] DESIGNED BY: [Signature] DATE: [Signature]
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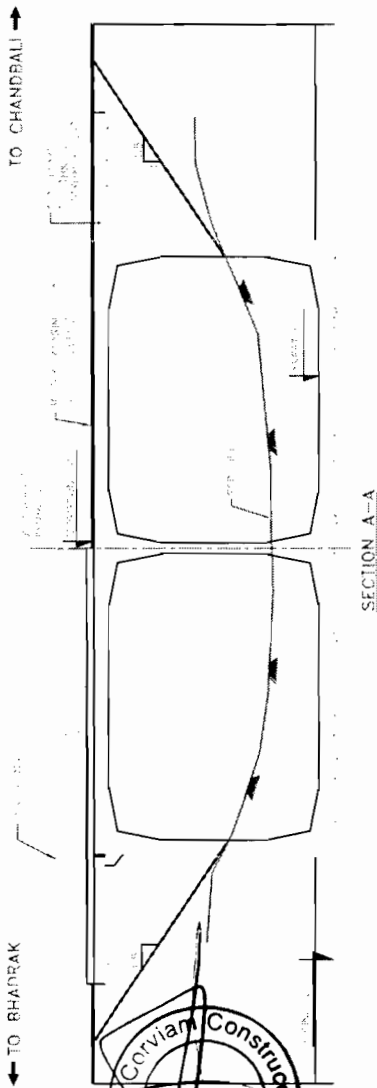


**NOTES:**

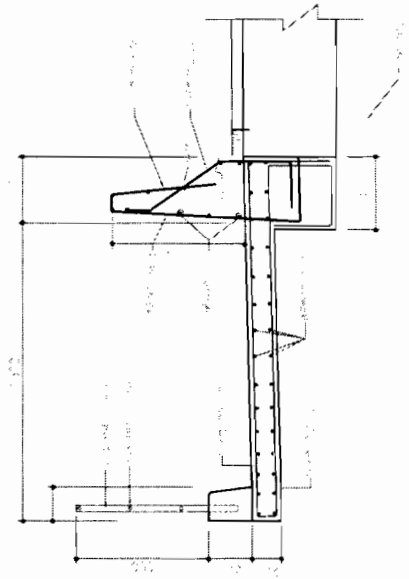
1. The bridge is to be constructed on the existing ground level. The ground level is to be maintained throughout the length of the bridge.

2. The bridge is to be constructed on the existing ground level. The ground level is to be maintained throughout the length of the bridge.

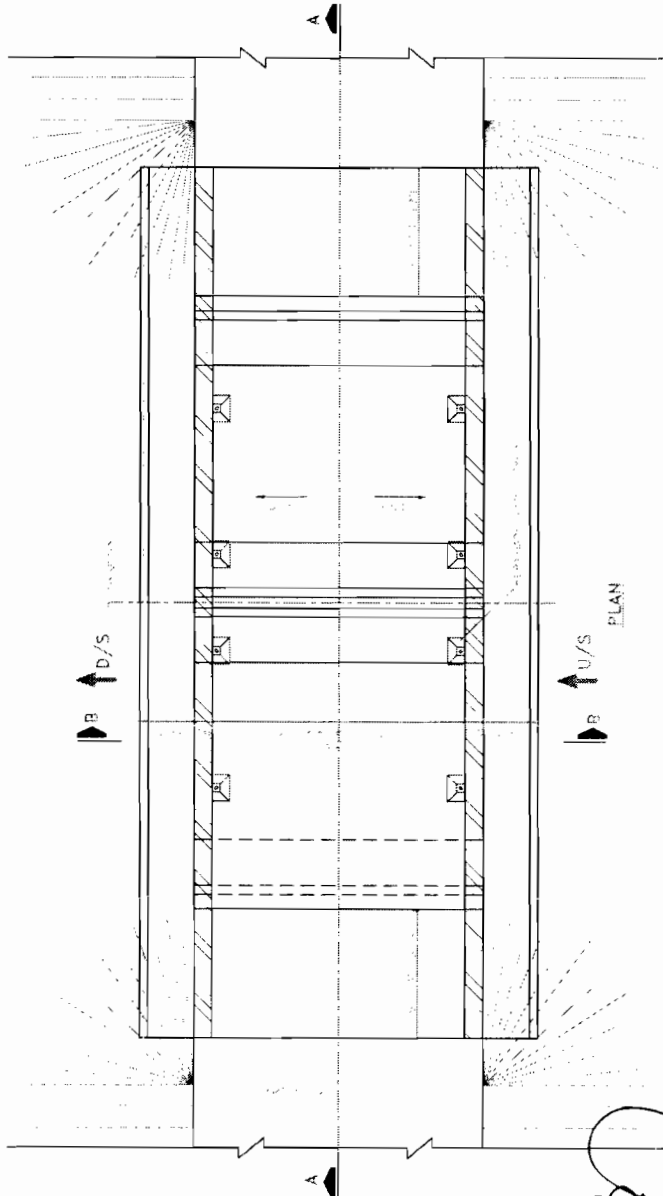
**REFERENCE DRAWINGS**



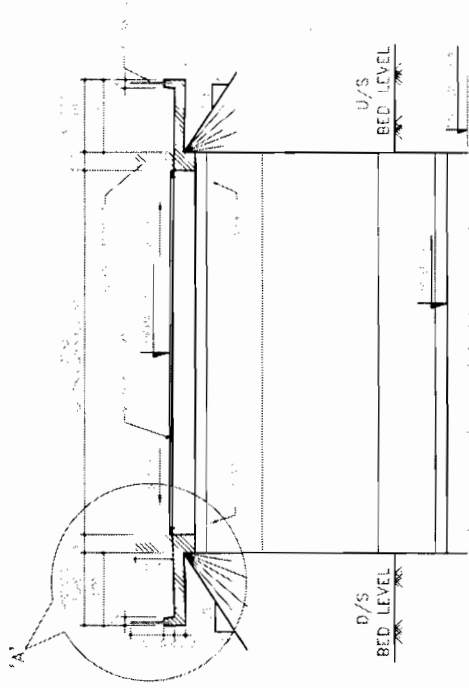
SECTION A-A



DETAIL AT 'A'



PLAN



SECTION B-B

**GENERAL ARRANGEMENT DRAWING**

BRIDGE AT KM 30+200

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

**SOURCE:**

**CONSULTING ENGINEERS GROUP LTD.**  
E-12, 1st Floor, Colony, Bhubaneswar, Odisha-751006  
Ph: 2511141, 2520089, 2521092, 2520056  
Fax: 2511141, 2520089, 2521092, 2520056  
E-mail: ceg@ceggroup.com



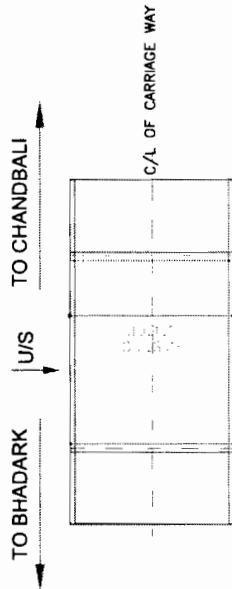
DESIGNED BY :	CHKD BY :	DATE :	SCALE :
DRAWN BY :	APPROVED BY :	DATE :	SCALE :

NOTES:

EXISTING BRIDGE DETAILS	
1	Chinage 34/700
2	Name of the nallah Talajharia Khatha Polo
3	Year of construction 1975
4	Type of bridge High level Bridge
5	Existing span arrangement 1 x 10.3m
6	Existing carriage way width 7.25 m
7	Thickness of superstructure 0.85 m
8	Type of foundation Open Foundation
9	Type of substructure PCC with skin reinforcement wall type
10	Type of superstructure RCC girder with slab
11	Existing Formation Level 8.3 m
12	Final Formation Level 8.3 m
13	Bed Level 4.544 m
14	Distance of P.C.L. w.r.t. F.C.L. 0.375 m Le0

REHABILITATION MEASURES SUGGESTED	
S. no.	Reference Drawings
1	Bed protection shall be provided OSRP/CEG/SH-53/BR/FPW/02
2	Existing Railings shall dismantled and crash barrier shall be provided OSRP/CEG/BR/MISC-02
3	Expansion joint Asphaltic plug type expansion joint shall be provided OSRP/CEG/BR/MISC-02
4	Approach slab to be done by chipping out top 300 mm concrete from top wall OSRP/CEG/BR/MISC-02
5	Return Wall Return walls shall be repaired by surface treatment with polymer modified mortar -

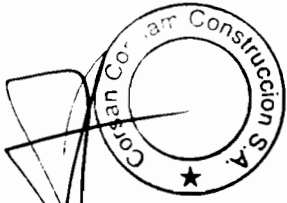


(A1) D/S (A2)

KEY PLAN

HYDROLOGICAL DATA

Design Discharge in (cum/sec)	Max. scour Level in (mts)	Depth of curtain Wall in (mts)		Length of Rigid Apron in (mts)		Length of Flexible Apron in (mts)	
		u/s	d/s	u/s	d/s	u/s	d/s
100	5.5	DCW <sub>1</sub>	DCW <sub>2</sub>	DCW <sub>1</sub>	DCW <sub>2</sub>	LFA <sub>1</sub>	LFA <sub>2</sub>
		5.0	7.5	5.0	5.0	5.0	5.0



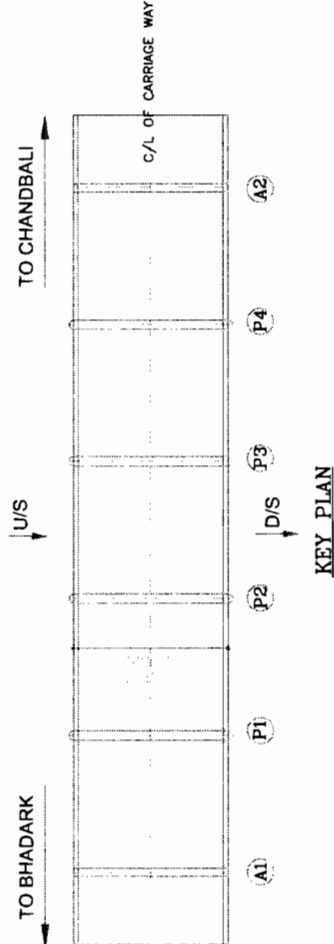
NOTES:

**EXISTING BRIDGE DETAILS**

1	Chainage	38+100
2	Name of the nallah	Haladigaandha Ghansura
3	Year of construction	2005
4	Type of bridge	High level Bridge
5	Existing span arrangement	3 x 10.45m
6	Existing carriage way width	8.1 m
7	Thickness of superstructure	0.6 m
8	Type of foundation	Pile Foundation
9	Type of substructure	PCC with skin reinforcement wall type
10	Type of superstructure	RCC girder with slab
11	Existing Formation Level	9.2 m
12	Final Formation Level	9.2 m
13	Bed Level	3.984 m
14	Distance of PCL w.r.t ECL	0.01 mt Left

**REHABILITATION MEASURES SUGGESTED**

S. no.	Items	Rehabilitation Measures	Reference Drawings
1	Expansion joint	Expansion joints shall be replaced by asphaltic plug type (6 nos)	OSRP CEG BRAMIS'-42
2	Bearing	The superstructure shall be lifted from the support at bed level and Neoprene bearing (Size 400 x 250 x 48 mm) shall be placed	MOST STANDARD DRG. NO. SD 204
3	Honey combing	Honeycombing observed on dipfrags and girders shall be take care by polymer modified concrete	-
4	Bed Protection	Bed protection to be done newly	OSRP CEG SH-WBR FPW-01
5	Approach Revetment	Approach revetment to be repacked	OSRP CEG BRAMIS'-42
6	Approach Slab	Approach slab to be constructed	OSRP CEG BRAMIS'-42

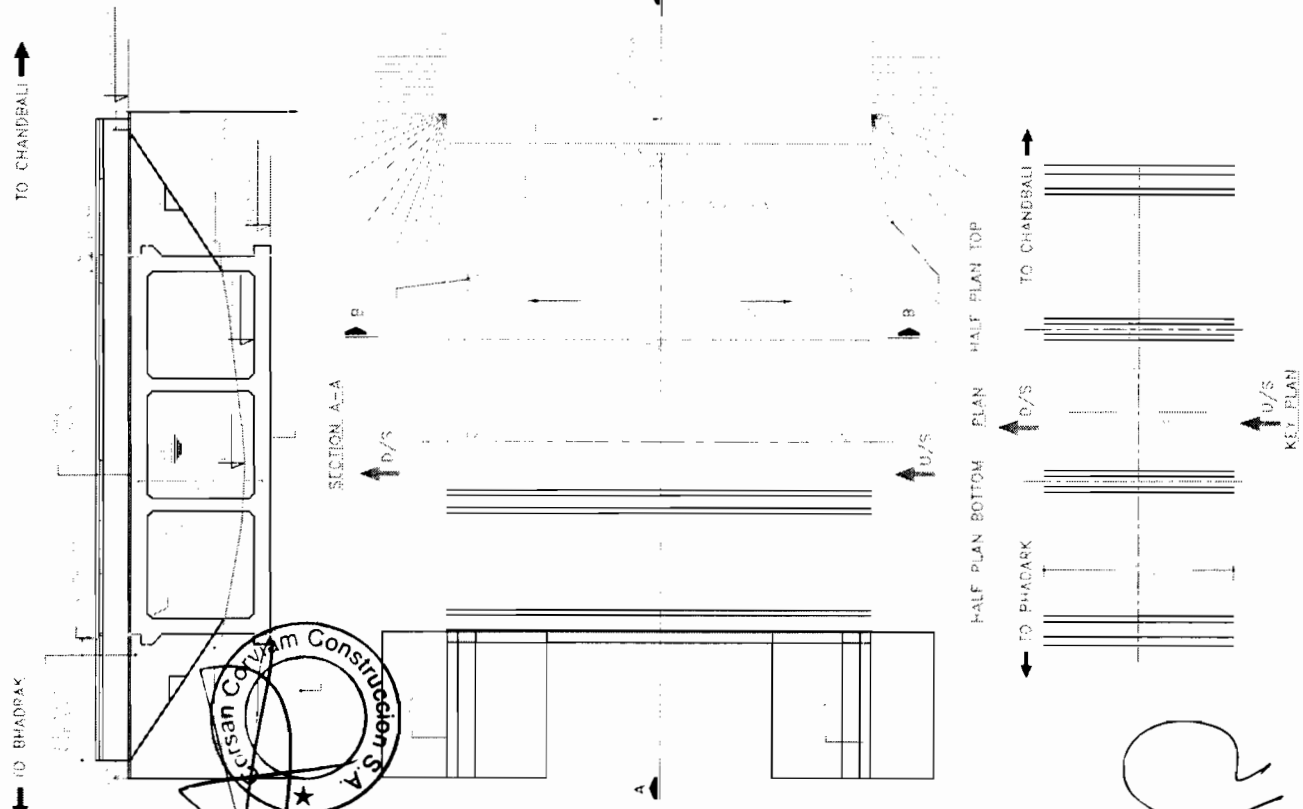


**KEY PLAN**

<p>OSR ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE</p>	<p>REHABILITATION BRIDGE DETAILS</p>	
	<p>BRIDGE AT KM. 38+100</p>	<p>OSRP CEG BRAMIS'-42</p>

NOTES:

REFERENCE DRAWING: -



DIMENSION DETAILS OF BOX

BOX TYPE	WIDTH (mm)	HEIGHT (mm)	e (mm)	d (mm)	THICKNESS (mm)	f (mm)	THICKNESS (mm)	g (mm)	THICKNESS (mm)	BEARING CAPACITY
1	25425.0	7.515	5.54	4.04	-2.5%	2.944	4.95	2.556	2.706	2
2	27925.0	8.162	5.25	4.45	-2.5	0.127	4.715	2.607	2.757	2
3	28900.0	7.978	5.02	4.215	-2.5	5.48	2.064	2.214	2	
4	31050.0	8.200	5.87	5.073	-2.5	5.573	1.971	2.121	1	
5	31150.0	8.200	5.87	5.073	-2.5	5.156	2.016	2.166	2	
6	32380.0	7.828	5.46	4.656	-2.5	5.325	2.319	2.469	2	
7	34025.0	8.300	5.63	4.825	-2.5	5.281	2.264	2.259	2	
8	34375.0	8.046	5.58	4.781	0.09	5.004	2.620	2.770	2	
9	35000.0	8.280	5.30	4.504	-2.5	4.76	3.029	3.026	2	
10	35090.0	8.292	5.06	4.26	0.06	5.288	2.232	2.382	2	
11	35280.0	8.176	5.59	4.768	-2.5	5.068	2.930	3.080	2	
12	37000.0	8.654	5.37	4.568	-2.5	5.202	2.688	2.848	2	
13	37075.0	8.556	5.50	4.702	-2.5	5.86	2.332	2.752	3	
14	41750.0	9.118	6.16	5.36	-7					

LIST OF PROPOSED BRIDGES OF 3 X 3 M BOX (WITHOUT CUSHION)

Sl. No.	PROPOSED CHAINAGE (m)	FORMATION LEVEL (m)	BED LEVEL (m)	FOUNDING SUPER ELEVATION (m)	INVERT LEVEL (m)	RIGHT CAMBER (%)	LEFT CAMBER (%)	THICKNESS (mm)	THICKNESS (mm)	THICKNESS (mm)	THICKNESS (mm)	BEARING CAPACITY	UH (m)	H (m)	RH
1	25425.0	7.515	5.54	4.04	-2.5%	2.944	-2.5%	4.95	2.556	2.706	2				
2	27925.0	8.162	5.25	4.45	-2.5	0.127	4.715	2.607	2.757	2					
3	28900.0	7.978	5.02	4.215	-2.5	5.48	2.064	2.214	2						
4	31050.0	8.200	5.87	5.073	-2.5	5.573	1.971	2.121	1						
5	31150.0	8.200	5.87	5.073	-2.5	5.156	2.016	2.166	2						
6	32380.0	7.828	5.46	4.656	-2.5	5.325	2.319	2.469	2						
7	34025.0	8.300	5.63	4.825	-2.5	5.281	2.264	2.259	2						
8	34375.0	8.046	5.58	4.781	0.09	5.004	2.620	2.770	2						
9	35000.0	8.280	5.30	4.504	-2.5	4.76	3.029	3.026	2						
10	35090.0	8.292	5.06	4.26	0.06	5.288	2.232	2.382	2						
11	35280.0	8.176	5.59	4.768	-2.5	5.068	2.930	3.080	2						
12	37000.0	8.654	5.37	4.568	-2.5	5.202	2.688	2.848	2						
13	37075.0	8.556	5.50	4.702	-2.5	5.86	2.332	2.752	3						
14	41750.0	9.118	6.16	5.36	-7										

E.I.C.(Civil), Odisha  
Bhubaneswar.

**GENERAL ARRANGEMENT DRAWING**

**TRIPPLE CELL R.C.C. BOX CULVERT**  
3m X3m (WITH OUT CUSHION)

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

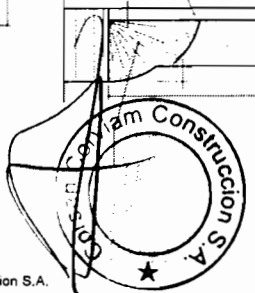
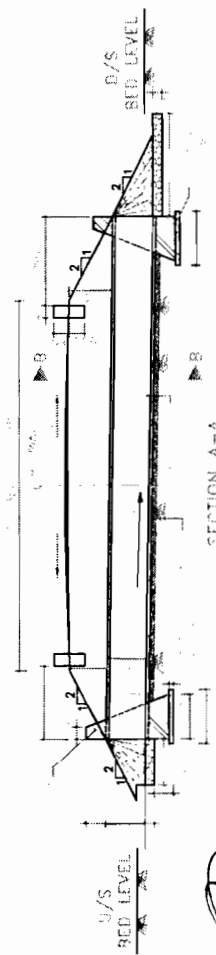
**CONSULTING ENGINEERS GROUP LTD.**  
World Bank Project, Odisha  
E.I.C.(Civil), Odisha Bhubaneswar

**REVISIONS:**

NO.	DATE	BY	CHKD BY	APPD BY

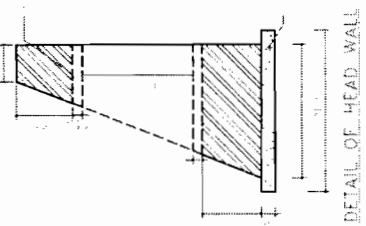




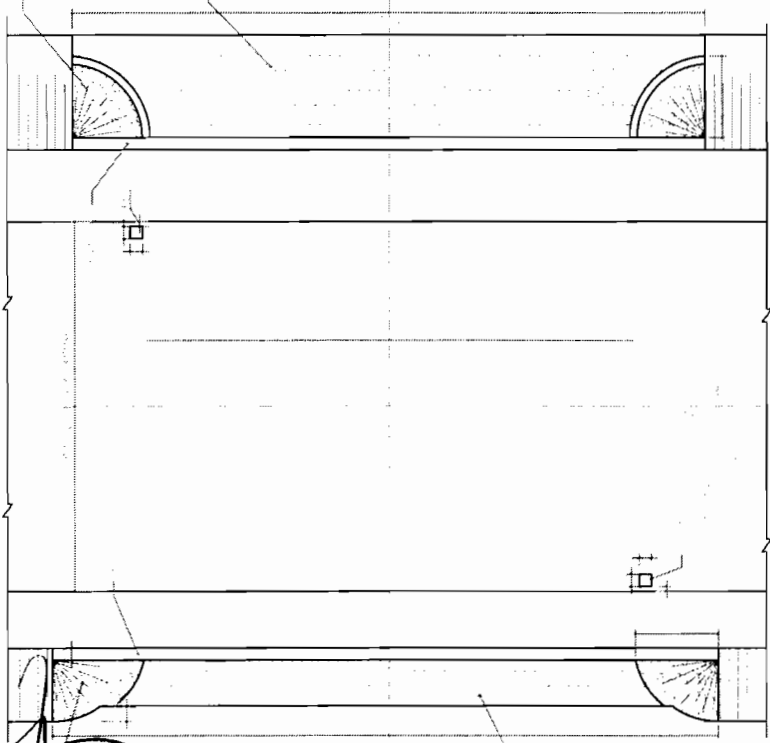


Corvan Construction S.A.  
Contractor

NOTES:



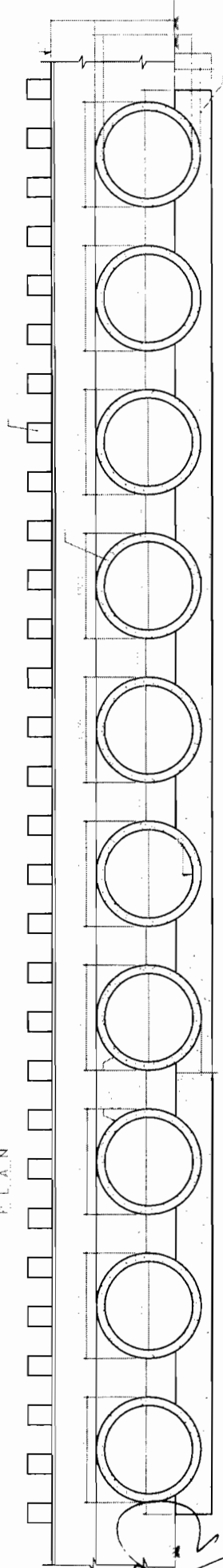
DETAIL OF HEAD WALL



PLAN

S. no.	Proposed Chalcage	Formation Level	Bed Super-elevation		Height of RR		LW1	RW1	Total length	No of pipes
			Left	Right	H1	H2				
1	14+485	8.52	5.92	-2.5	1.7	1.7	3.4	3.4	16.8	70
2	16+550	8.47	5.92	-2.5	1.7	1.7	3.4	3.4	18.8	70
3	25+550	7.531	5.87	-2.5	0.9	0.9	1.4	1.7	15.1	60
4	26+800	9.025	6.28	-2.5	0.8	0.8	1.6	1.6	12.2	60
5	28+800	7.899	5.54	-2.5	1.6	1.6	3.2	3.2	18.9	70
6	29+950	7.899	5.54	-2.5	0.6	0.6	1.1	1.1	14.3	60
7	31+900	7.873	6.36	-2.5	0.6	0.6	1.1	1.1	14.3	60
List of Additional Bridges of 10 x 1.0 m Pipe List of Additional Bridges of 15 x 1.0 m Pipe										
1	8+710	12.327	-2.5	-2.5	1.7	1.7	3.4	3.4	18.8	105

FOR 15 Row Pipes Spacing and edge distance shall also be same.



SECTION B-B

**CEG**  
CONSULTING ENGINEERS GROUP LTD.  
E-72(B) Colony, Bhubaneswar, Odisha  
Ph: 2531344, 2531345  
www.ceggroup.com

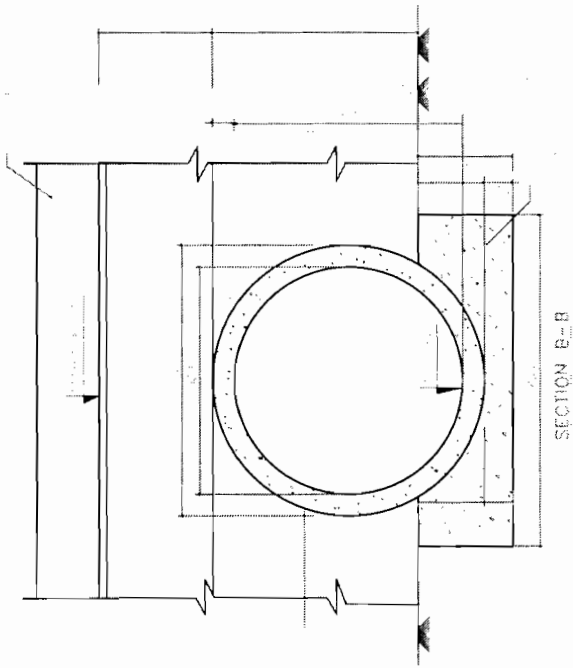
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

TYPICAL ARRANGEMENT  
FOR R.C.C TEN PIPE BRIDGES (1.0m DIA)  
(HEIGHT OF FILL VARYING FROM 0.6 TO 4.0 M)

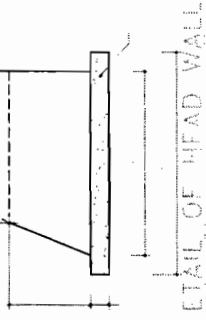
DATE: 24.01.2013  
DRAWN BY: [Signature]  
CHECKED BY: [Signature]  
DESIGNED BY: [Signature]  
SCALE: 1/20

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

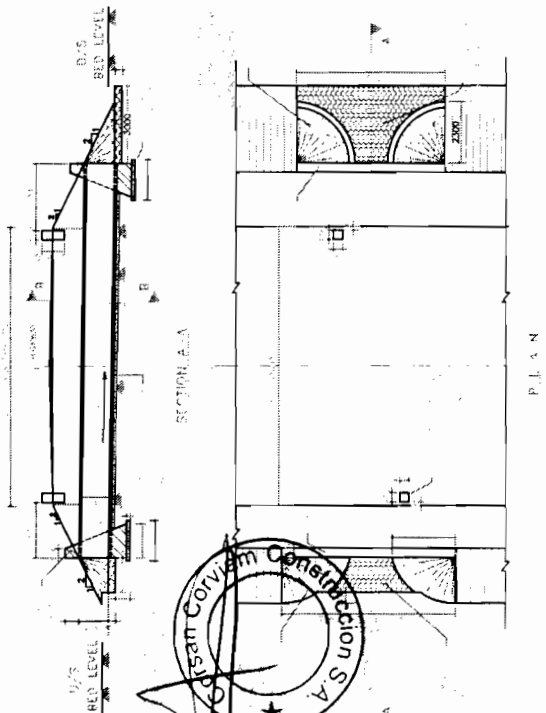
NOTES:



SECTION B-B



DETAIL OF HEAD WALL

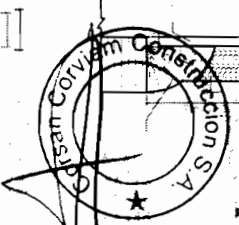


SECTION A-A

P.L.A.N

**SINGLE PIPE CULVERTS LEVEL DETAIL**

Sl. No.	Location	Proposed Chainage	Proposed Level		Bed Level		Camber/Super Elevation		Direction of Flow
			Left	Right	Left	Right	Left	Right	
1	2/500	2507	17.76	13.67	15.60	-2.5%	-2.5%	R TO L	
2	7/900	7927	13.02	11.11	11.56	-2.50%	-2.50%	R TO L	



Corsan Corviam Construccion S.A.  
Contractor

Chief Engineer,  
World Bank Project, Odisha  
Road Development Project

To the E.I.C. (Civil) Odisha  
Bhubaneswar.

Notes:

**CEG CONSULTING ENGINEERS GROUP LTD.**  
E-12, 46/3 Colony, Mahapalpur, Cuttack - 751007  
Tel: +91-674-2520996, 2521899, 2520556  
Fax: 2521346, E-mail: ceg@cegroupindia.com



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

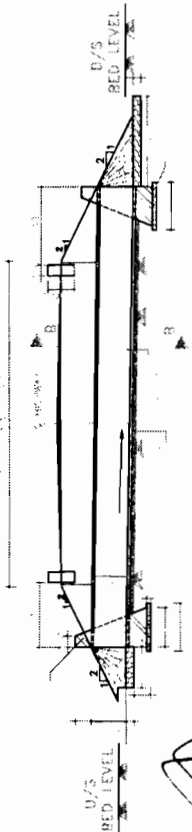
**TYPICAL ARRANGEMENT  
FOR R.C.C SINGLE PIPE CULVERTS (1X1.0m DIA)  
(BHAVANAK - CHANDRAL)**

DESIGNED BY	CHK	DATE	02/04/17
CHECKED BY	CHK	DATE	02/04/17
APPROVED BY	CHK	DATE	02/04/17

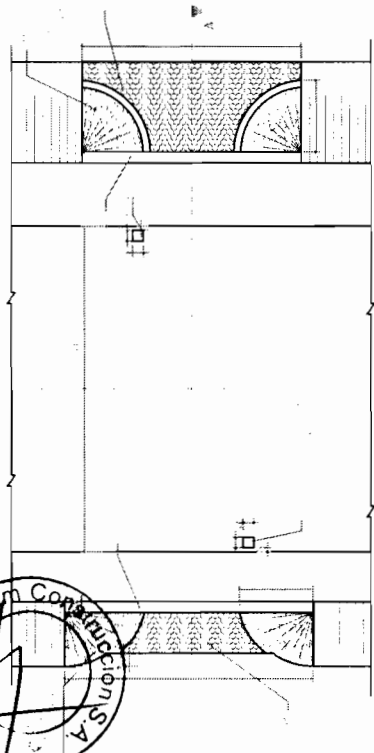


**DOUBLE PIPE CULVERTS LEVEL DETAIL**

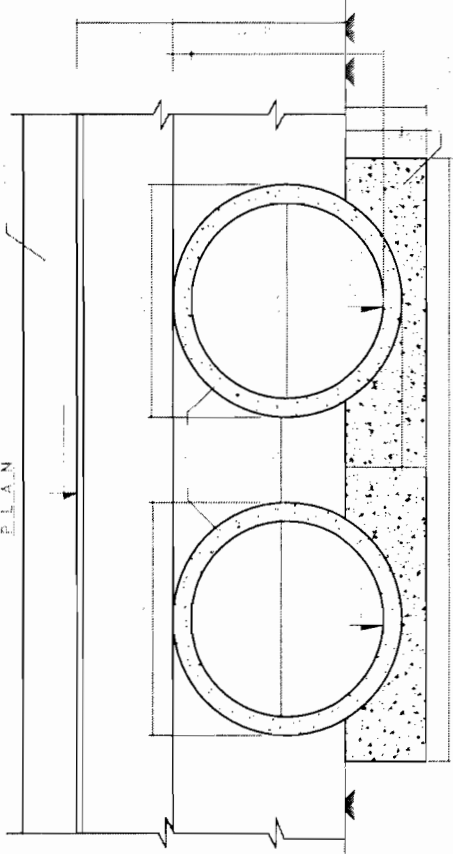
Sl. No.	Location	Proposed Chainage	Proposed Foramtion Level	Bed Level	Right	Left	Right	Left	Camber/Super Elevation	Direction of Flow
1	6/990	7001	13.890	12.07	12.07	12.07	-2.50%	-2.50%		R T O L
2		9027	11.963							



SECTION A-A

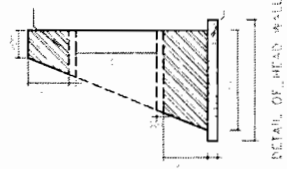


SECTION B-B



SECTION P-P

NOTES:



DETAIL OF HEAD WALL

Chief Engineer,  
Water Resources Office  
Go the E.L.C. (Civil) Odisha  
Bhubaneswar.

Checked by	DATE	Checked by	DATE
Drawn by	DATE	Checked by	DATE
Scale		Checked by	DATE

**TYPICAL ARRANGEMENT**  
FOR R.C.C DOUBLE PIPE CULVERTS (2x1.0m DIA)  
(BHADRAK - CHANDBALI-6806)

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

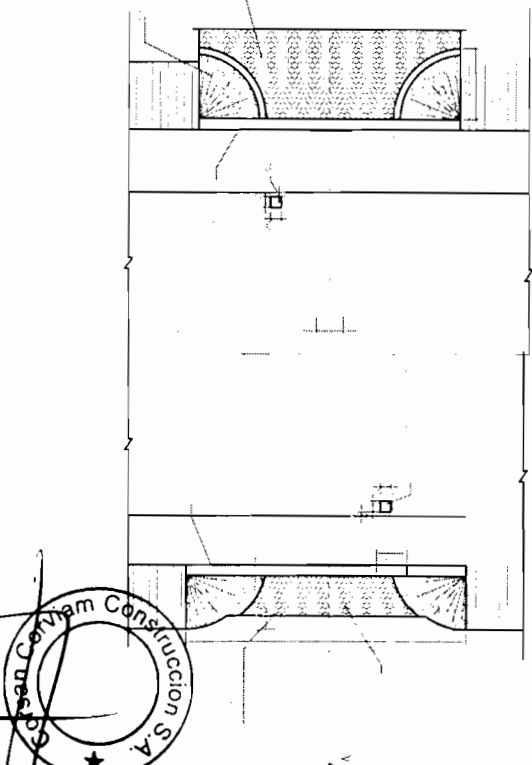
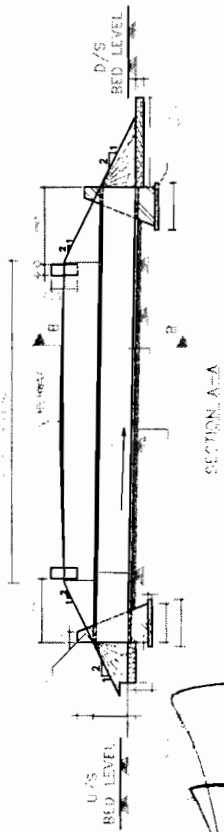
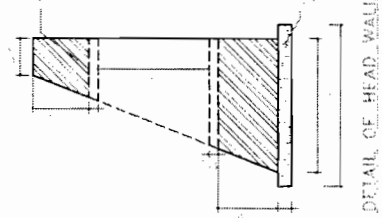
**CONSULTING ENGINEERS GROUP LTD.**  
E-12, Raj Colony, Bhubaneswar - 751017  
Ph. 2520859, 2520860, 2520858  
Fax: 2521344, e-mail: ceg@cegroup.co.in




**FIVE ROW PIPE CULVERT**

Sl. No.	Location	Proposed Chalnage	Proposed Formation Level		Bed Level		Invert Level		Camber/Super Elevation		Direction of flow
			Left	Right	Left	Right	Left	Right	Left	Right	
1	4/300	4350	15.82	12.73	12.57	12.73	16.64	16.64	-2.5%	-2.5%	L TO R
2	4/900	4935	15.31	12.99	13.29	12.99	12.69	12.69	-4.3%	-4.3%	R TO L
3	6/448	6448	14.398								

NOTES



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

**CEC CONSULTING ENGINEERS GROUP LTD.**  
E-12, 10/1, Colony, Mahapalpur, Bhubaneswar-751008  
Tel: +91-674-2320899, 2321899, 2320558  
Fax: 2321340, e-mail: cec@cecpk.com

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

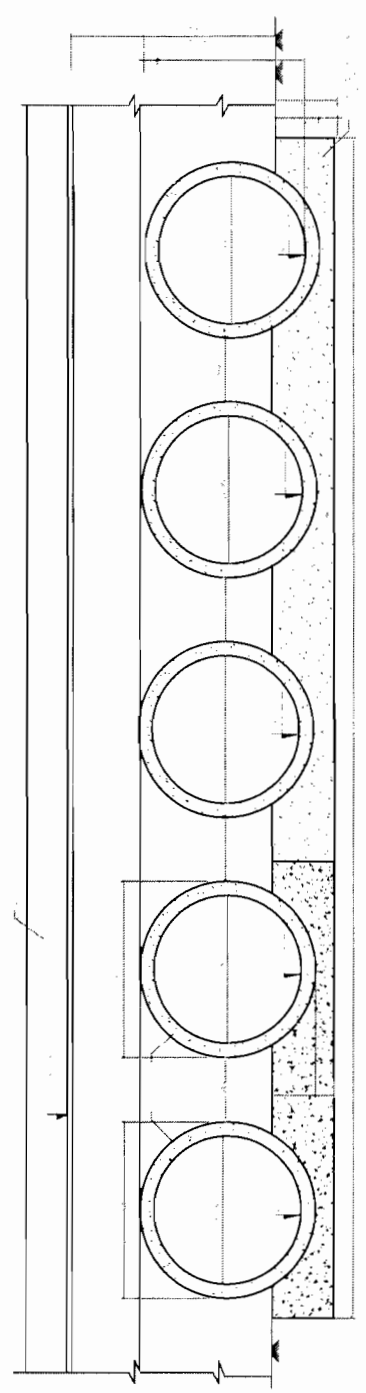
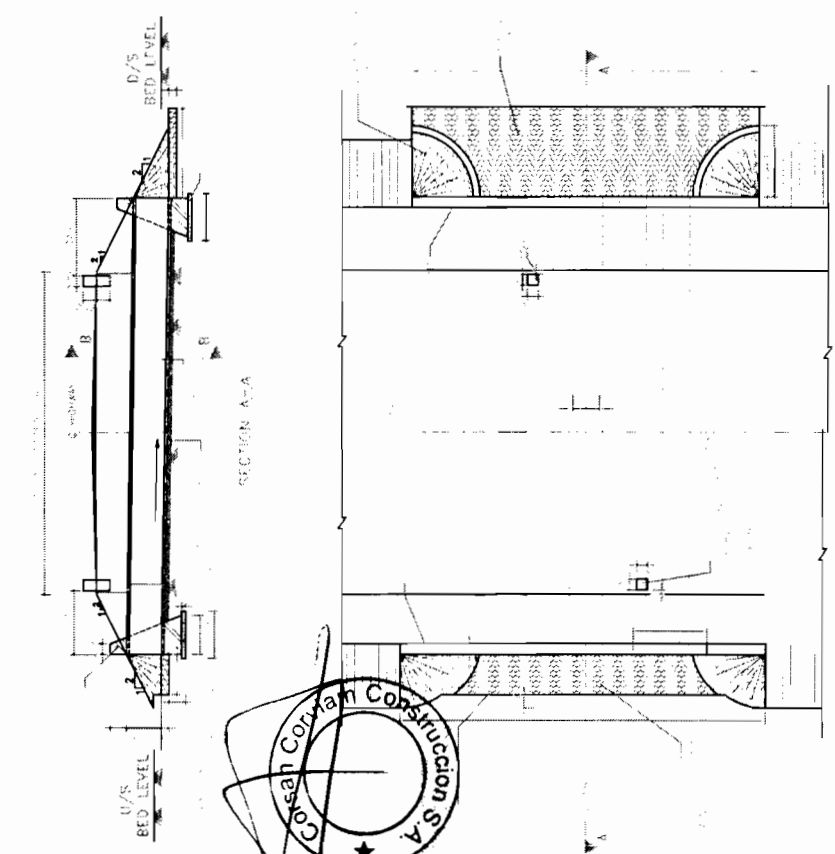
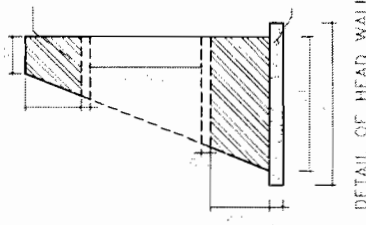
**TYPICAL ARRANGEMENT**  
FOR R.C.C MULTI PIPE CULVERTS (3 X 1.0m DIA)  
(BHADRAK, CHANDIGALL-IBRM)

DESIGNED NO. : 000/2018/01/01/01/01/01/01  
DATE : 01/01/2018  
DRAWN BY : [Signature]  
CHECKED BY : [Signature]  
APPROVED BY : [Signature]

FIVE ROW PIPE CULVERT

Sl. No.	Location	Proposed Chaining	Proposed Formation Level	Bed Level		Invert Level		Camber/Supar Elevation		Direction of flow
				Left	Right	Left	Right	Left	Right	
1	16700	16733	8.57	6.50	6.90	6.20	-2.5%	-2.5%	L TO R	
2	17100	17078	8.60	6.80	6.90	6.50	-4.3%	-2.5%	L TO R	
3	17700	17666	8.08	6.57	6.35	6.27	-2.5%	-2.5%	L TO R	
4	17900	17928	7.90	6.05	6.51	5.75	-2.5%	-2.5%	L TO R	
5	18200	18195	7.76	6.07	6.53	5.77	-2.5%	-2.5%	L TO R	
6	18600	18627	8.02	6.08	6.09	5.78	-2.5%	-2.5%	L TO R	
7	19100	19066	8.64	6.69	6.45	6.39	-2.2%	2.2%	L TO R	
8	20200	20365	8.26	7.54	6.55	6.54	-2.5%	-2.5%	L TO R	
9	20700	20891	7.92	6.06	6.16	5.78	-2.5%	-2.5%	L TO R	
10	21050	21074	7.69	5.92	5.62	5.62	-2.5%	-2.5%	L TO R	
11	21150	21235	7.69	5.68	5.99	5.38	-2.5%	-2.5%	L TO R	
12	21400	21490	7.72	5.55	5.89	5.25	-2.5%	-2.5%	L TO R	
13	22700	22570	8.57	6.34	6.04	6.04	-2.5%	-2.5%	L TO R	
14	24350	24478	7.61	5.73	5.80	5.43	-2.5%	-2.5%	L TO R	
15	25200	25249	7.44	5.46	5.68	5.16	-2.5%	-2.5%	R TO L	
16	39300	39387	8.76	6.85	6.85	6.55	-2.5%	-2.5%	R TO L	
17	39800	39837	8.93	7.12	6.79	6.79	-2.5%	-2.5%	R TO L	
18	40350	40310	8.41	6.50	6.20	6.20	-2.5%	-2.5%	R TO L	
19	40950	40974	9.16	6.48	7.10	6.40	-2.5%	-2.5%	R TO L	

NOTES:



SECTION B-B

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

**TYPICAL ARRANGEMENT**  
 FOR R.C.C MULTI PIPE CULVERTS (BX1.0m DA)  
 (SHADRAN-CHANDRABALLI-JRKM)

**CONSULTING ENGINEERS GROUP LTD.**  
 E-12, Mid-Corony Market, New Market-17  
 Tel: +91-11-2320893, 2321892, 2320258  
 Fax: 2321348, e-mail: cege@cegroupindia.com

DRAWING NO.: OWP/CIW/18-09/APP/CL-14  
 DATE: 20/11/2013  
 SHEET NO.: 18 OF 21  
 DESIGNED BY: CS  
 CHECKED BY: CS  
 APPROVED BY: CS





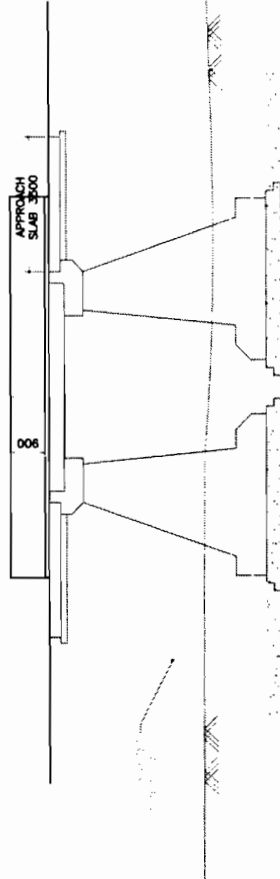
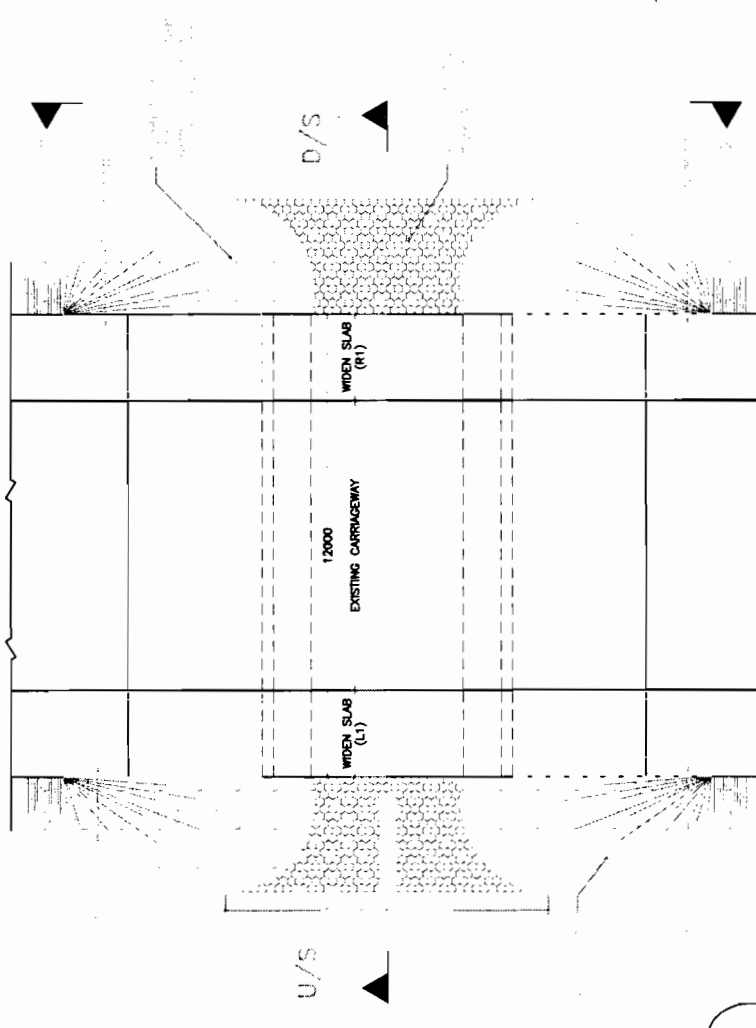
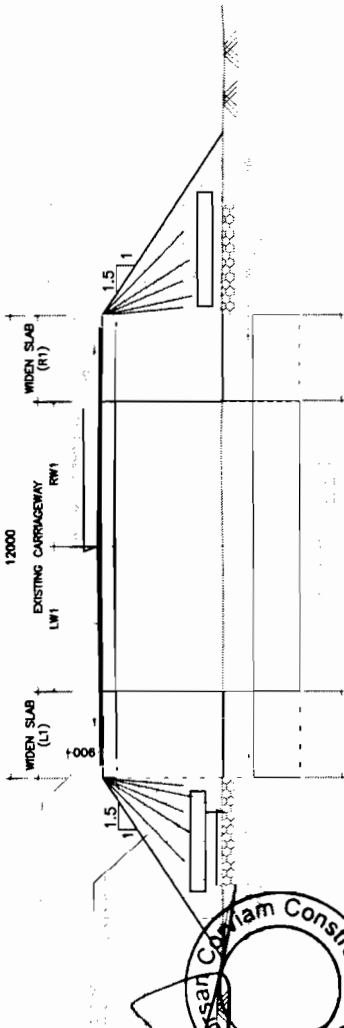
**NOTES :-**

- 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 F<sub>8</sub> 500.
- 4 SUB STRUCTURE SHALL BE IN CONCRETE GRADE M-15 WITH SURFACE REINFORCEMENT #6 @200C/C BOTHWAYS.
- 5 GRADE OF CONC. RCC SLAB - M-25 PCC - M-15

REFERENCE DRAWING:-

- 1 OSRP/CEG/SH-9/SIAB CUL/W-02

Sl. No.	Location	Proposed Chaining	Proposed Existing Span	Proposed Formation Level		Bed /invert Level		Camber/Superelevation		Clear Height	LWI RW1	Direction of flow	Total Length to be widened		Length of Return wall
				Left	Right	Left	Right	Left	Right				Left	Right	
1	21800	2885	1 x 3.0	17.26	15.06	15.06	-2.5%	-2.5%	-2.5%	2.1	37	RTOL	2.3	4.2	4.2
2	19200	1988	2 x 2.3	8.11	6.66	6.84	-2.5%	-2.5%	-2.5%	1.3	44	L TOR	1.6	1.4	2.9



FORM NO. :

GENERAL ARRANGEMENT DRAWING

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

TYPICAL WIDENING FOR EXISTING  
SLAB CULVERTS

**CEG**  
CONSULTING  
ENGINEERS GROUP LTD.  
E-1, 2nd Floor, Connaught Place, New Delhi-110028  
Tel: 26101344, Fax: 26101344, e-mail: ceg@egpnl.com

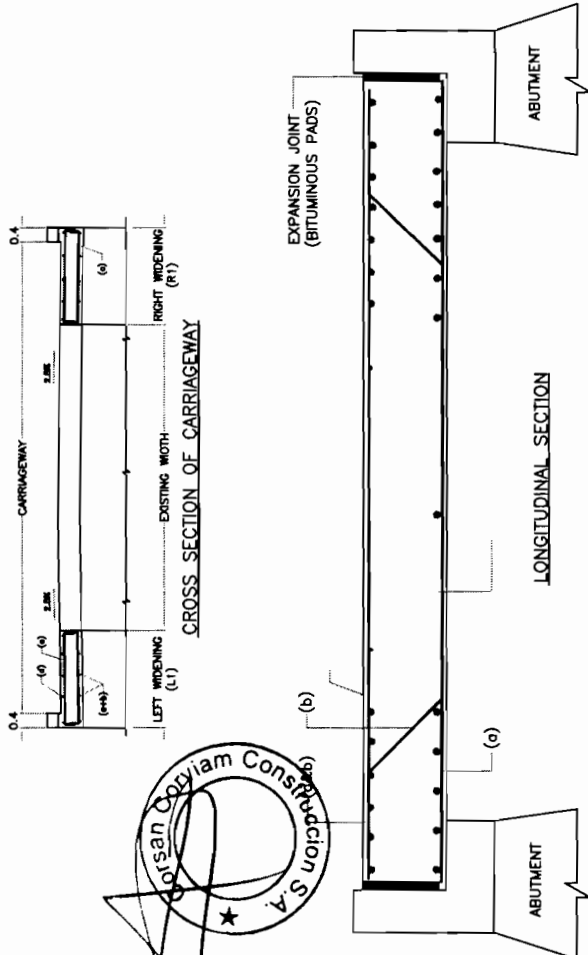
DESIGNED BY	DATE	SCALE	APPROVED BY
DR/2002/003			
DRAWN BY	DATE	SCALE	APPROVED BY

**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 @200/C BOTHWAYS.

**REFERENCE DRAWING:-**

- 1 OSRP/CEG/SH-9/SLAB CUL/N-01

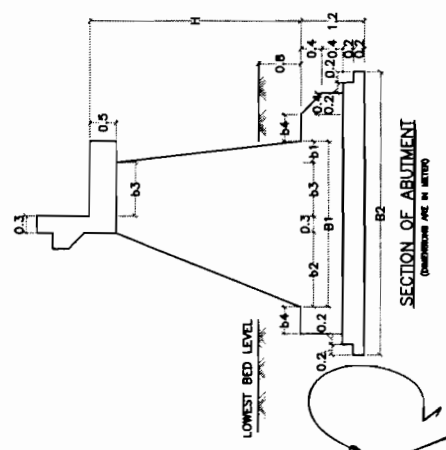


**TABLE OF DIMENSIONS FOR RETURN WALL**

SPAN	UPTO 2 METRES			3 METRES			4 METRES		
	H	b1	b2	H	b1	b2	H	b1	b2
1.0	1.50	2.00	2.50	3.00	3.50	4.00	1.50	2.00	2.50
2.0	1.50	2.00	2.50	3.00	3.50	4.00	1.50	2.00	2.50
3.0	1.50	2.00	2.50	3.00	3.50	4.00	1.50	2.00	2.50
4.0	1.50	2.00	2.50	3.00	3.50	4.00	1.50	2.00	2.50
5.0	1.50	2.00	2.50	3.00	3.50	4.00	1.50	2.00	2.50
6.0	1.50	2.00	2.50	3.00	3.50	4.00	1.50	2.00	2.50

**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
1.0	2.0m	2.5m	3.0m	3.5m	4.0m	4.5m	2.0m	2.5m	3.0m
2.0	2.0m	2.5m	3.0m	3.5m	4.0m	4.5m	2.0m	2.5m	3.0m
3.0	2.0m	2.5m	3.0m	3.5m	4.0m	4.5m	2.0m	2.5m	3.0m
4.0	2.0m	2.5m	3.0m	3.5m	4.0m	4.5m	2.0m	2.5m	3.0m
5.0	2.0m	2.5m	3.0m	3.5m	4.0m	4.5m	2.0m	2.5m	3.0m
6.0	2.0m	2.5m	3.0m	3.5m	4.0m	4.5m	2.0m	2.5m	3.0m



**REINFORCEMENT TABLE FOR SLAB CULVERTS**

Clear Span (m)	UPTO 2 METRES			3 METRES			4 METRES		
	H	b1	b2	H	b1	b2	H	b1	b2
1.0	1.50	2.00	2.50	3.00	3.50	4.00	1.50	2.00	2.50
2.0	1.50	2.00	2.50	3.00	3.50	4.00	1.50	2.00	2.50
3.0	1.50	2.00	2.50	3.00	3.50	4.00	1.50	2.00	2.50
4.0	1.50	2.00	2.50	3.00	3.50	4.00	1.50	2.00	2.50
5.0	1.50	2.00	2.50	3.00	3.50	4.00	1.50	2.00	2.50
6.0	1.50	2.00	2.50	3.00	3.50	4.00	1.50	2.00	2.50

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

CONSULTING ENGINEERS GROUP LTD.  
E-12, 1st Floor, Colony, Bhubaneswar, Odisha  
Tel: 491-141-2510099, 2551099, 2551098  
Fax: 2512134, e-mail: ceg@odisha.com



PROJECT: ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE

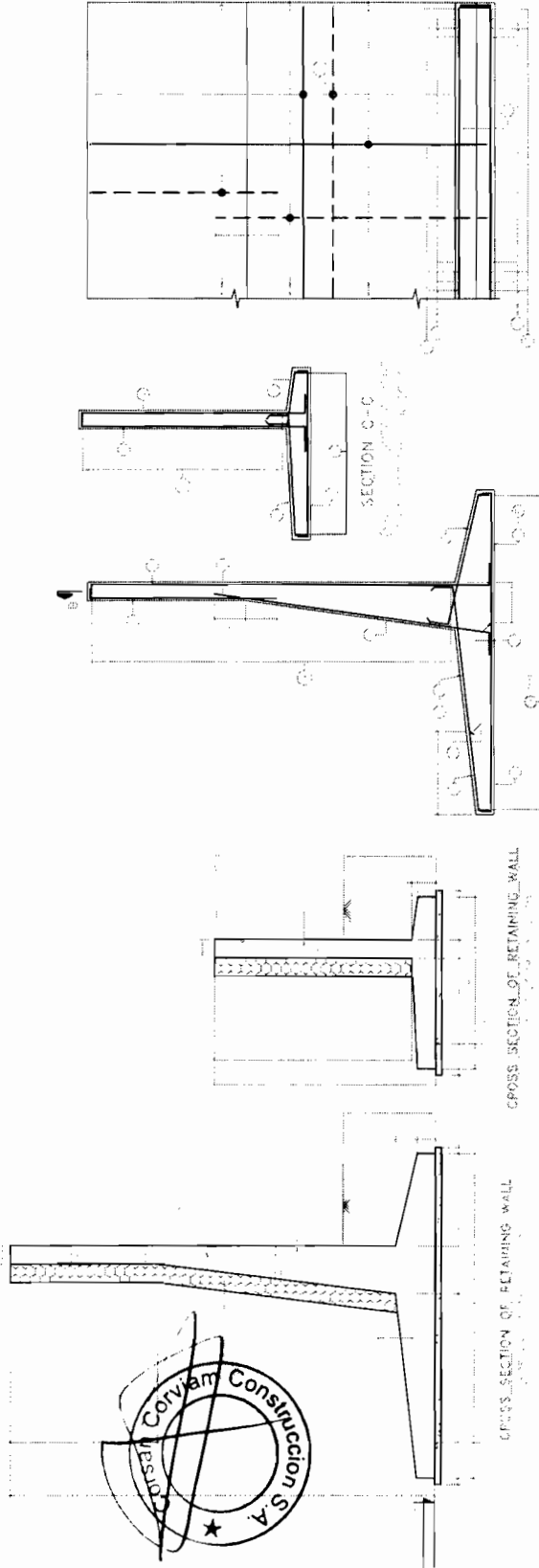
DESIGNED BY: ...

CHECKED BY: ...

DATE: ...

NOTES

SECTION B-B



CROSS SECTION OF RETAINING WALL

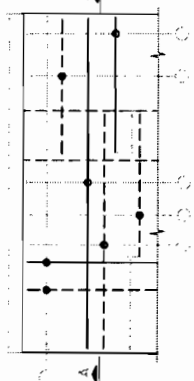
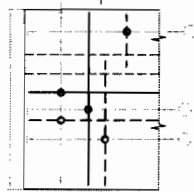
SECTION A-A

SECTION B-B

SECTION C-C

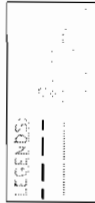
LENGTH OF CURTAINMENT

DIMENSIONAL DETAILS



PLAN SHOWING REINFORCEMENT IN BASE SLAB

PLAN SHOWING REINFORCEMENT IN BASE RAFT



REINFORCEMENT DETAILS

REINFORCEMENT DETAILS

1	1015.0	3 x 3 m Triple Box	4.26	4.26	3.5	3.5	D
2	1755.0	3 x 3 m Triple Box	4.42	4.42	3.5	3.5	D
3	9150.0	3 x 3 m Triple Box	4.19	4.19	4.75	4.75	D
4	13645.0	3 x 3 m Triple Box	3.74	3.89	3.5	3.5	C
5	27925.0	3 x 3 m Triple Box	4.26	4.26	5.0	5.0	D
6	27925.0	3 x 3 m Triple Box	4.26	4.26	5.0	5.0	D
7	28160.0	2 x 6.0 m Box	5.30	5.30	4.0	4.0	E
8	28837.0	3 x 3 m Triple Box	4.85	4.85	4.75	4.75	D
9	28900.0	3 x 3 m Triple Box	4.31	4.31	5.0	5.0	D
10	30154.0	3 x 3 m Triple Box	4.62	4.27	4.1	4.1	D
11	31150.0	3 x 3 m Triple Box	3.68	3.68	4.5	4.5	C
12	31150.0	3 x 3 m Triple Box	3.68	3.68	4.5	4.5	C
13	32100.0	1 x 6.0 m Box	4.06	4.06	3.5	3.5	D
14	32380.0	3 x 3 m Triple Box	3.72	3.72	4.5	4.5	C
15	33540.0	3 x 3 m Triple Box	4.79	4.79	6.1	6.1	D
16	33540.0	3 x 3 m Triple Box	4.79	4.79	6.1	6.1	D
17	33540.0	3 x 3 m Triple Box	4.04	4.04	5.0	5.0	D
18	34375.0	3 x 3 m Triple Box	3.97	3.97	5.0	5.0	C
19	35000.0	3 x 3 m Triple Box	4.33	4.33	5.0	5.0	D
20	35000.0	3 x 3 m Triple Box	4.74	4.58	6.0	6.0	D
21	35280.0	3 x 3 m Triple Box	3.94	3.94	5.0	5.0	C
22	35280.0	3 x 3 m Triple Box	3.94	3.94	5.0	5.0	C
23	37050.0	3 x 3 m Triple Box	4.64	4.64	6.0	6.0	D
24	37050.0	3 x 3 m Triple Box	4.40	4.40	5.5	5.5	D
25	41750.0	3 x 3 m Triple Box	4.04	4.88	5.0	6.0	D
26	42487.0	1 x 6.0 m Box	5.83	5.63	3.5	3.5	E
27	43550.0	1 x 6.0 m Box	3.76	4.44	3.5	3.5	D

No. Change	Proposed Span	Height of Return wall		Length of Return wall		Category for the wall height
		Left	Right	Left	Right	
1	3 x 3 m Triple Box	4.26	4.26	3.5	3.5	D
2	3 x 3 m Triple Box	4.42	4.42	3.5	3.5	D
3	3 x 3 m Triple Box	4.19	4.19	4.75	4.75	D
4	3 x 3 m Triple Box	3.74	3.89	3.5	3.5	C
5	3 x 3 m Triple Box	4.26	4.26	5.0	5.0	D
6	3 x 3 m Triple Box	4.26	4.26	5.0	5.0	D
7	2 x 6.0 m Box	5.30	5.30	4.0	4.0	E
8	3 x 3 m Triple Box	4.85	4.85	4.75	4.75	D
9	3 x 3 m Triple Box	4.31	4.31	5.0	5.0	D
10	3 x 3 m Triple Box	4.62	4.27	4.1	4.1	D
11	3 x 3 m Triple Box	3.68	3.68	4.5	4.5	C
12	3 x 3 m Triple Box	3.68	3.68	4.5	4.5	C
13	1 x 6.0 m Box	4.06	4.06	3.5	3.5	D
14	3 x 3 m Triple Box	3.72	3.72	4.5	4.5	C
15	3 x 3 m Triple Box	4.79	4.79	6.1	6.1	D
16	3 x 3 m Triple Box	4.79	4.79	6.1	6.1	D
17	3 x 3 m Triple Box	4.04	4.04	5.0	5.0	D
18	3 x 3 m Triple Box	3.97	3.97	5.0	5.0	C
19	3 x 3 m Triple Box	4.33	4.33	5.0	5.0	D
20	3 x 3 m Triple Box	4.74	4.58	6.0	6.0	D
21	3 x 3 m Triple Box	3.94	3.94	5.0	5.0	C
22	3 x 3 m Triple Box	3.94	3.94	5.0	5.0	C
23	3 x 3 m Triple Box	4.64	4.64	6.0	6.0	D
24	3 x 3 m Triple Box	4.40	4.40	5.5	5.5	D
25	3 x 3 m Triple Box	4.04	4.88	5.0	6.0	D
26	1 x 6.0 m Box	5.83	5.63	3.5	3.5	E
27	1 x 6.0 m Box	3.76	4.44	3.5	3.5	D

PROJECTS

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

DIMENSION & REINFORCEMENT  
DETAILS OF RETURN WALL

DATE: 25/11/2016

SCALE: 1/100

NO. OF SHEETS: 1/1

TOTAL NO. OF SHEETS: 1

DESIGNED BY: [Signature]

CHECKED BY: [Signature]

APPROVED BY: [Signature]

DATE: 25/11/2016

SCALE: 1/100

NO. OF SHEETS: 1/1

TOTAL NO. OF SHEETS: 1

DESIGNED BY: [Signature]

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DESIGNED BY: [Signature]

CHECKED BY: [Signature]



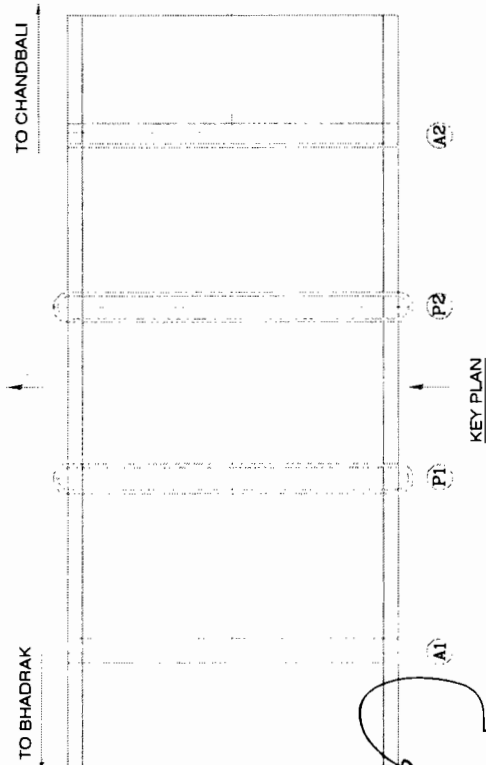
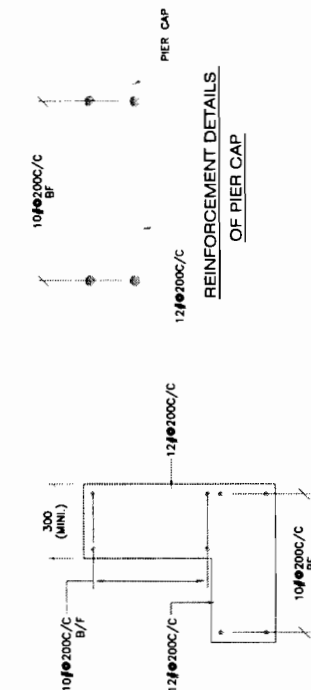
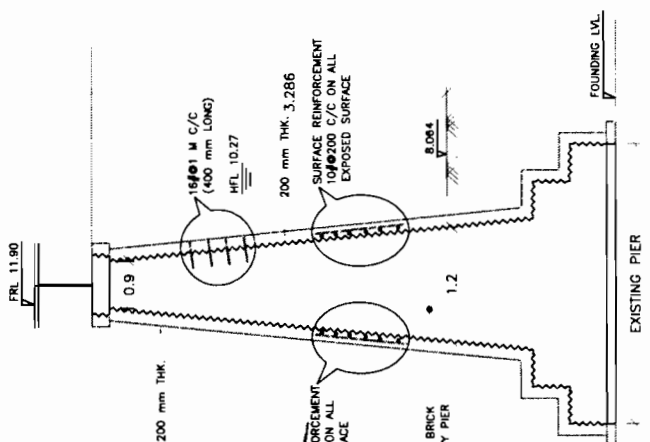
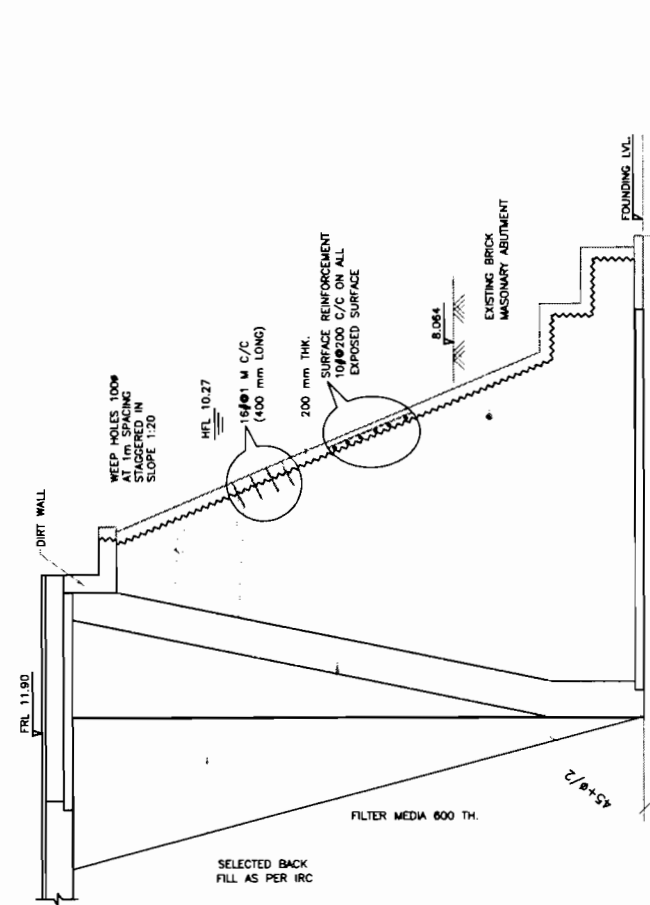






**NOTES :-**

- 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  $\phi$  2.5KG/50M 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.



Chief Engineer  
 World Bank Project  
 O/o the E.P.O (Civil), Orisha  
 Bhubaneswar

DRAWING NO. : CORV-CEB/17/01	
DATE : 24/07/2017	SCALE : AS SHOWN
DESIGNED BY : [Signature]	CHECKED BY : [Signature]
DATE : 08/08/17	DATE : 08/08/17
08	08
ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE	
JACKETING DETAIL OF ABUTMENT & PIER	





# GOVERNMENT OF ODISHA WORKS DEPARTMENT

## ODISHA STATE ROAD PROJECT ( UNDER WORLD BANK ASSISTANCE )

BHADRAK-ANANDPUR (SH-53)  
KM.0/0 TO KM.43/0

### VOLUME - IV DRAWINGS

# INDEX OF HIGHWAY DRAWINGS

SL.	DESCRIPTION	DRAWING NO.
1	Cover Sheet	
<b>INDEX SHEETS</b>		
2	Index of Highway Drawings	OSRP/CEG/SH-53/INDEX/01
3	Index of Other Highway and Environment Drawing	OSRP/CEG/SH-53/INDEX/02
4	Index of Drawings of Structures	OSRP/CEG/SH-53/INDEX/03
5	List of Structure (Culverts) (1 of 2)	OSRP/CEG/SH-53/LOS/01
6	List of Structure (Culverts) (2 of 2)	OSRP/CEG/SH-53/LOS/02
7	List of Proposed Stretches of Highway	OSRP/PMU/SH-53/AS/01
<b>HORIZONTAL CURVE DETAILS</b>		
8	Horizontal Curve Details (1 of 2)	OSRP/CEG/SH-53/HC/01
9	Horizontal Curve Details (2 of 2)	OSRP/CEG/SH-53/HC/02
<b>VERTICAL CURVE DETAILS</b>		
10	Vertical Curve Details (1 of 3)	OSRP/CEG/SH-53/VC/01
11	Vertical Curve Details (2 of 3)	OSRP/CEG/SH-53/VC/02
12	Vertical Curve Details (3 of 3)	OSRP/CEG/SH-53/VC/03
<b>PLAN &amp; PROFILE</b>		
13	Plan & Profile km 0.000 to km 1.000	OSRP/CEG/SH-53/P & P/01
14	Plan & Profile km 1.000 to km 2.000	OSRP/CEG/SH-53/P & P/02
15	Plan & Profile km 2.000 to km 3.000	OSRP/CEG/SH-53/P & P/03
16	Plan & Profile km 3.000 to km 4.000	OSRP/CEG/SH-53/P & P/04
17	Plan & Profile km 4.000 to km 5.000	OSRP/CEG/SH-53/P & P/05
18	Plan & Profile km 5.000 to km 6.000	OSRP/CEG/SH-53/P & P/06
19	Plan & Profile km 6.000 to km 7.000	OSRP/CEG/SH-53/P & P/07
20	Plan & Profile km 7.000 to km 8.000	OSRP/CEG/SH-53/P & P/08
21	Plan & Profile km 8.000 to km 9.000	OSRP/CEG/SH-53/P & P/09
22	Plan & Profile km 9.000 to km 10.000	OSRP/CEG/SH-53/P & P/10
23	Plan & Profile km 10.000 to km 11.000	OSRP/CEG/SH-53/P & P/11
24	Plan & Profile km 11.000 to km 12.000	OSRP/CEG/SH-53/P & P/12
25	Plan & Profile km 12.000 to km 13.000	OSRP/CEG/SH-53/P & P/13
26	Plan & Profile km 13.000 to km 14.000	OSRP/CEG/SH-53/P & P/14
27	Plan & Profile km 14.000 to km 15.000	OSRP/CEG/SH-53/P & P/15
28	Plan & Profile km 15.000 to km 16.000	OSRP/CEG/SH-53/P & P/16
29	Plan & Profile km 16.000 to km 17.000	OSRP/CEG/SH-53/P & P/17
30	Plan & Profile km 17.000 to km 18.000	OSRP/CEG/SH-53/P & P/18
31	Plan & Profile km 18.000 to km 19.000	OSRP/CEG/SH-53/P & P/19
32	Plan & Profile km 19.000 to km 20.000	OSRP/CEG/SH-53/P & P/20
33	Plan & Profile km 20.000 to km 21.000	OSRP/CEG/SH-53/P & P/21
34	Plan & Profile km 21.000 to km 22.000	OSRP/CEG/SH-53/P & P/22
35	Plan & Profile km 22.000 to km 23.000	OSRP/CEG/SH-53/P & P/23

SL No.	DESCRIPTION	DRAWING NO.
36	Plan & Profile km 23.000 to km 24.000	OSRP/CEG/SH-53/P & P/24
37	Plan & Profile km 24.000 to km 25.000	OSRP/CEG/SH-53/P & P/25
38	Plan & Profile km 25.000 to km 26.000	OSRP/CEG/SH-53/P & P/26
39	Plan & Profile km 26.000 to km 27.000	OSRP/CEG/SH-53/P & P/27
40	Plan & Profile km 27.000 to km 28.000	OSRP/CEG/SH-53/P & P/28
41	Plan & Profile km 28.000 to km 29.000	OSRP/CEG/SH-53/P & P/29
42	Plan & Profile km 29.000 to km 30.000	OSRP/CEG/SH-53/P & P/30
43	Plan & Profile km 30.000 to km 31.000	OSRP/CEG/SH-53/P & P/31
44	Plan & Profile km 31.000 to km 32.000	OSRP/CEG/SH-53/P & P/32
45	Plan & Profile km 32.000 to km 33.000	OSRP/CEG/SH-53/P & P/33
46	Plan & Profile km 33.000 to km 34.000	OSRP/CEG/SH-53/P & P/34
47	Plan & Profile km 34.000 to km 35.000	OSRP/CEG/SH-53/P & P/35
48	Plan & Profile km 35.000 to km 36.000	OSRP/CEG/SH-53/P & P/36
49	Plan & Profile km 36.000 to km 37.000	OSRP/CEG/SH-53/P & P/37
50	Plan & Profile km 37.000 to km 38.000	OSRP/CEG/SH-53/P & P/38
51	Plan & Profile km 38.000 to km 39.000	OSRP/CEG/SH-53/P & P/39
52	Plan & Profile km 39.000 to km 40.000	OSRP/CEG/SH-53/P & P/40
53	Plan & Profile km 40.000 to km 41.000	OSRP/CEG/SH-53/P & P/41
54	Plan & Profile km 41.000 to km 42.000	OSRP/CEG/SH-53/P & P/42
55	Plan & Profile km 42.000 to km 43.000	OSRP/CEG/SH-53/P & P/43
<b>MAJOR JUNCTION</b>		
56	Major Junction at Aandpur	OSRP/CEG/SH-53/MJ/42-400

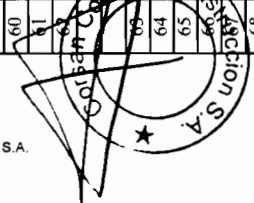
**INDEX OF HIGHWAY DRAWINGS**

PROJECT:-	DRG NO. OSRP/CEG/SH-53/INDEX/01	REV. NO. PREPARED BY: CEG Ltd.	REV. R1 PREPARED BY: EE/PMU	APPROVED
ORISSA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE	SH. NO. DATE : 17/1/2013	REV : R1		CE, World Bank Projects.
	SCALE			



# INDEX OF OTHER HIGHWAY & ENVIRONMENT DRAWINGS

NO	DESCRIPTION	DRAWING NO.	DRAWING NO.
<b>SCHEDULES</b>			
57	Schedule of Road Sign Post (1 of 3)	OSRP/CEG/SH-16/SCH/01	OSRP/CEG/KM & GP
58	Schedule of Road Sign Post (2 of 3)	OSRP/CEG/SH-16/SCH/02	OSRP/CEG/IRD
59	Schedule of Road Sign Post (3 of 3)	OSRP/CEG/SH-16/SCH/03	OSRP/CEG/RPM
60	Schedule of Extra Widening & Guard Post:	OSRP/CEG/SH-16/SCH/16	OSRP/CEG/RPM/01
61	Schedule for Pavement Composition	OSRP/CEG/SH-16/SCH/PAV	OSRP/CEG/RM/01
62	Schedule for Pavement TCS Detail:	OSRP/CEG/SH-16/SCH/TCS	OSRP/CEG/RM/02
<b>GENERAL SECTIONS</b>			
63	Typical Cross Sections	OSRP/CE/TCS/ 2 & 3	OSRP/CEG/RS/03
64	Typical Cross Sections	OSRP/CE/TCS/ 8 & 9	OSRP/CEG/RS/04
65	Typical Cross Sections	OSRP/CE/TCS/ 18&33	OSRP/CEG/BB/01
66	Typical Cross Sections	OSRP/CE/TCS/ 38&39	OSRP/CEG/BB/02
67	Typical Slope Protection work	OSRP/CEG/PW	
68	Standard Drawings Details of Drains & Kert	OSRP/CEG/DR	
69	Details of Application of Super Elevator	OSRP/CEG/SE	
<b>JUNCTION/INTERSECTIONS DETAILS</b>			
70	Typical 4-Legged Intersection with single Lane BT Road	OSRP/CEG/JN/01	
71	Typical T-Junction with Single Lane BT Road	OSRP/CEG/JN/02	
72	Typical Y-Junction With Single Lane BT/Earthen Road	OSRP/CEG/JN/03	
73	Standard Drawings Typical - Cross Drain/Single Lane BT Road/Earth Road	OSRP/CEG/CD-JN	
<b>ROAD SIGNS, MARKINGS &amp; Misc. ROADWAY FURNITURES</b>			
74	Standard Drawings Details of Road Humps & Rumble Strip:	OSRP/CEG/RH & RS	OSRP/CEG/ENV-03
75	Schedule of Humps & Pedestrian Crossings:	OSRP/CEG/SCH-RH&RS	OSRP/CEG/ENV-05
76	Standard Drawings Details of Footpath Barrier:	OSRP/CEG/FB	OSRP/CEG/ENV-14
77	Standard Drawings Metal Beam Crash Barrier Details	OSRP/CEG/CB	OSRP/CEG/MISC - 01
78	Standard Drawings Typical KM Stone & 5th KM Stone	OSRP/CEG/KM/01	OSRP/PMU/ENV - 01
<b>TOLL PLAZA DETAILS</b>			
91	Standard Drawings of Toll Plaza Layout	OSRP/CEG/TP/01	OSRP/CEG/ENV/06
92	Standard Drawings Toll Plaza Main Office	OSRP/CEG/TP/02	
93	Standard Drawings Toll Booth:	OSRP/CEG/TP/03	
94	Standard Drawings Barrier Gate for Toll Plaza	OSRP/CEG/TP/04	
95	Standard Drawings Electrical Layout and Main Office	OSRP/CEG/TP/05	
96	Standard Drawings Electrical Layout Toll Plaza	OSRP/CEG/TP/06	
97	Standard Drawings plumbingG Layout - Toll Plaza	OSRP/CEG/TP/07	
<b>ENVIRONMENT DRAWINGS</b>			
98	Toe Wall for Water Bodies:	OSRP/CEG/ENV-03	
99	Interception Barricade for Institution:	OSRP/CEG/ENV-05	
100	Typical arrangement for Reptile Under Pass:	OSRP/CEG/ENV-14	
101	Typical Arrangement for Utility Duc	OSRP/CEG/MISC - 01	
102	Typical Drawing for Silt Fence Sediment Arrestor	OSRP/PMU/ENV - 01	
103	Oil & Grease Trap for Plant Site	OSRP/CEG/ENV/06	



PROJECT:-		Index of Other Highway & Environment Drawings	
DRG NO.	OSRP/CEG/SH-53/INDEX/02	DRAWN BY	CEG
SH.NO.	DATE : 17/1/2013	REV R1	PREPARED BY
SCALE	REV	EE-PMU	Chief Engineer, World Bank Projects
ORISSA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE		Approved	

# INDEX OF STRUCTURAL DRAWINGS

SL. NO	DRAWING TITLE	DRAWING NO.	SL. NO	DRAWING TITLE	DRAWING NO.
104	General Notes (For Slab Bridges)	OSRP/CEG/SH-53/BR/NOTES/01	118	REHABILITATION BRIDGE AT KM. 19+300 REHABILITATION BRIDGE DETAILS	OSRP/CEG/SH-53/BR/19+300/01
105	BRIDGE AT KM. 9+800 GENERAL ARRANGEMENT DRAWING	OSRP/CEG/SH-53/BR/9+800/01	119	BRIDGE AT KM. 30+950 REHABILITATION BRIDGE DETAILS	OSRP/CEG/SH-53/BR/30+950/01
106	SITE PLAN BRIDGE AT KM 11+600	OSRP/CEG/SH-53/BR/9+800/02	120	CULVERT DRAWING FOR R.C.C. SINGLE PIPE CULVERTS (1.0 m DIA) (HEIGHT OF FILL VARYING FROM 0.6 TO 4.0 M.)	OSRP/CEG/SH-53/PIPE CUL-01
107	SITE PLAN DIMENSION & REINFORCEMENT DETAILS	OSRP/CEG/SH-53/BR/11+600/01	121	FOR R.C.C. DOUBLE PIPE CULVERTS (1.0 m DIA) (HEIGHT OF FILL VARYING FROM 0.6 TO 4.0 M.)	OSRP/CEG/SH-53/PIPE CUL-02
109	SITE PLAN BRIDGE AT KM 17+700	OSRP/CEG/SH-53/BR/11+600/03	122	TYPICAL WIDENING ARRANGEMENT FOR R.C.C. SINGLE PIPE CULVERTS (1.0 m DIA)	OSRP/CEG/SH-53/PIPE CUL EXT-01
110	GENERAL ARRANGEMENT DRAWING	OSRP/CEG/SH-53/BR/17/700/01	123	GENERAL ARRANGEMENT DRAWING SINGLE CELL R.C.C. BOX CULVERT	OSRP/CEG/SH-53/BOX CUL -01
111	DIMENSION & REINFORCEMENT DETAILS	OSRP/CEG/SH-53/BR/17/700/02	124	REINFORCEMENT DETAIL OF SINGLE CELL BOX SINGLE CELL R.C.C. BOX CULVERT	OSRP/CEG/SH-53/BOX CUL -02
112	SITE PLAN BRIDGE AT KM 18+400	OSRP/CEG/SH-53/BR/17/700/03	125	GENERAL ARRANGEMENT DRAWING TRIPLE CELL R.C.C. BOX CULVERT	OSRP/CEG/SH-53/TRIPLE BOX/1
113	GENERAL ARRANGEMENT DRAWING	OSRP/CEG/SH-53/BR/18+400/01	126	MISC DRAWING DIMENSION & REINFORCEMENT DETAILS OF RETAINING WALL	OSRP/CEG/SH-53/RW/MISC-01
114	SITE PLAN BRIDGE AT KM. 38+200	OSRP/CEG/SH-53/BR/18+400/02	127	DIMENSION & REINFORCEMENT DETAILS OF RETURN WALL	OSRP/CEG/SH-53/RW/MISC-02
115	GENERAL ARRANGEMENT DRAWING	OSRP/CEG/SH-53/BR/38+200/01	128	TYPICAL SECTIONS OF CURTAIN WALL	OSRP/CEG/SH-53/BR/SCW
116	DIMENSION & REINFORCEMENT DETAILS OF SUB STRUCTURE	OSRP/CEG/SH-53/BR/38+200/02	129	TYPICAL DETAILS OF FLOOR PROTECTION WORKS DETAILS OF CRASH BARRIER EXPANSION JOINT APPROACH SLAB & DRAINAGE SPOUT	OSRP/CEG/SH-53/BR/FPW/01
117	SITE PLAN	OSRP/CEG/SH-53/BR/38+200/03	130		OSRP/CEG/SH-53/BR/MISC-02

## Index of Drawings of Structures

DRG NO.	OSRP/CEG/SH-53/INDEX/03	REV :	REV R1	APPROVED
SH.NO.	DATE : 17/1/2013	R1	PREPARED BY EE/PMU	CE, World Bank Projects.
SCALE				

PROJECT:-

ORISSA STATE ROAD PROJECT



**List of Culverts for Balance Work (with Status)**

S. No.	Chainage	Type	Span	Indicative Present Status	S. No.	Chainage	Span	Type	Indicative Present Status	S. No.	Chainage	Span	Type	Indicative Present Status
55	24/375	2x1.0	PIPE	Not strated	73	31/097	2x1.0	HP DOUBLE ROW	Not strated	91	36/510	1/34/0	BOX CELL	Excavation Completed and filled back for restoration of traffic
56	25/253	2x1.0	HP DOUBLE ROW	Not strated	74	31/353	2x1.0	PIPE	Not strated	92	36/624	1/44/0	BOX CELL	Excavation Completed and filled back for restoration of traffic
57	25/290	2x1.0	PIPE	Pipe portion done, rest to be done	75	31/484	1x1.0	PIPE	Not strated	93	36/892	3x3 m	REHABILITATION	Dismantling done
58	25/351	2x1.0	PIPE	Pipe portion done, rest to be done	76	31/776	2x1.0	PIPE	Not strated	94	36/989	3x3 m	REHABILITATION	Dismantling done
59	26/025	2x1.0	PIPE	Pipe portion done, rest to be done	77	32/108	2x1.0	PIPE	Not strated	95	37/120	3x3 m	REHABILITATION	Not strated
60	26/351	2x1.0	PIPE	Pipe portion done, rest to be done	78	32/528	2x1.0	PIPE	Pipe portion done, rest to be done	96	37/276	3x3 m	REHABILITATION	Not strated
61	26/351	1x1.0	PIPE	Head wall and remaining work to be done.	79	32/964	2x1.0	PIPE	R/S Head wall not completed, remaining to be done.	97	37/573	1x10.8	BOX TYPE BRIDGE	Not strated
62	26/699	2x1.0	PIPE	Not strated	80	33/013	1/22/0	PIPE	Pipe portion done, rest to be done	98	38/300	1/34/0	BOX CELL	Not strated
63	27/440	2x0.9	PIPE	Pipe portion done, rest to be done	81	33/655	1x0.9	PIPE	Pipe portion done, rest to be done	99	38/088	1/33/0	BOX CELL	Not strated
64	27/733	1x1.0	PIPE	Pipe portion done, rest to be done	82	34/204	2x1.0	PIPE	Pipe portion done, rest to be done	100	38/665	1/43/0	BOX CELL	Box Cell Raf & 1st lift wall completed remaining to be done
65	28/531	2x1.0	PIPE	Pipe portion done, rest to be done	83	34/662	2x1.0	PIPE	Pipe portion done, rest to be done	101	39/657	2x1.0	HP DOUBLE ROW	Not strated
66	28/684	2x1.0	PIPE	R/S Head wall not completed, remaining to be done.	84	34/935	1x1.0	PIPE	Pipe portion done, rest to be done	102	40/017	2x1.0	HP DOUBLE ROW	Not strated
67	29/159	1x1.0	PIPE	Not strated	85	35/281	2x1.0	HP DOUBLE ROW	Not strated	103	40/242	1/43/0	BOX CELL	Not strated
68	29/250	1x1.0	PIPE	Pipe portion done, rest to be done	86	35/444	1/23/0	BOX CELL	Completed upto slab casting, rest to be done.	104	40/808	1/33/0	BOX CELL	Not strated
69	29/374	2x0.9	PIPE	Pipe portion done, rest to be done	87	35/595	1/34/0	BOX CELL	Completed upto slab casting, rest to be done.	105	42/425	1/23/0	BOX CELL	Not strated
70	29/601	2x0.9	PIPE	Not strated	88	35/998	1/34/0	BOX CELL	Walls completed upto 2nd lift.	106	42/191	1/33/0	BOX CELL	Not strated
71	30/501	2x0.9	PIPE	Pipe portion done, rest to be done	89	30/638		REHABILITATION	Not strated					
72	30/684	2x1.0	PIPE	Pipe portion done, rest to be done	90	36/430	1/23/0	BOX CELL	Completed upto slab casting, rest to be done.					

**List of Culverts for Balance Work (with Status)**

DRG NO.	OSRP/CEG/SH-09/LOS/01	REV R1	APPROVED
SH.NO.	DATE : 18/01/2013	EE/PMU	CE, World Bank Projects
SCALE			

PROJECT:-

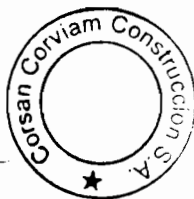
ORISSA STATE ROAD PROJECT

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

**KM wise Details of Attempted\* Works for SH-53**

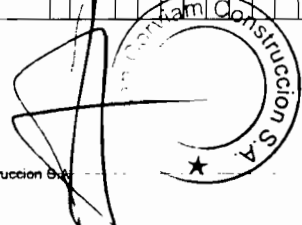
Chainage(KM)	Earth Work(Mtr.)		Sub Grade(Mtr.)		GSB(Mtr.)		WMM		DBM		BC	
	FROM	TO	LHS	RHS	LHS	RHS	LHS	RHS	LHS	RHS	LHS	RHS
0+000	1+000	-	-	-	-	-	-	-	-	-	-	-
1+000	2+000	-	-	-	-	-	-	-	-	-	-	-
2+000	3+000	-	200	200	-	-	-	-	-	-	-	-
3+000	4+000	-	-	-	-	-	-	-	-	-	-	-
4+000	5+000	400	400	400	400	400	400	400	400	400	400	400
5+000	6+000	950	950	950	950	950	950	950	850	850	850	850
6+000	7+000	1000	1000	1000	1000	1000	1000	1000	900	900	900	900
7+000	8+000	600	600	600	600	600	600	600	-	-	-	-
8+000	9+000	200	200	200	200	200	200	200	-	-	-	-
9+000	10+000	1000	1000	1000	1000	1000	1000	1000	-	-	-	-
10+000	11+000	1000	1000	1000	1000	1000	1000	1000	-	-	-	-
11+000	12+000	-	-	-	-	-	-	-	-	-	-	-
12+000	13+000	950	950	950	950	950	950	950	950	950	950	950
13+000	14+000	800	800	800	800	800	800	800	800	800	800	800
14+000	15+000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
15+000	16+000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
16+000	17+000	980	980	980	980	980	980	980	980	980	980	980
17+000	18+000	-	-	-	-	-	-	-	-	-	-	-
18+000	19+000	-	-	-	-	-	-	-	-	-	-	-
19+000	20+000	-	-	-	-	-	-	-	-	-	-	-
20+000	21+000	-	-	-	-	-	-	-	-	-	-	-
21+000	22+000	830	830	830	830	830	830	830	830	830	830	830
22+000	23+000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
23+000	24+000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
24+000	25+000	740	740	740	740	740	740	740	740	740	740	740
25+000	26+000	450	450	450	450	450	450	450	450	450	450	450
26+000	27+000	800	800	800	800	800	800	800	-	-	-	-
27+000	28+000	700	700	700	700	700	700	700	-	-	-	-
28+000	29+000	675	675	675	675	675	675	675	-	-	-	-
29+000	30+000	-	-	-	-	-	-	-	-	-	-	-
30+000	31+000	200	200	200	200	200	200	200	-	-	-	-
31+000	32+000	-	-	-	-	-	-	-	-	-	-	-
32+000	33+000	400	400	400	400	400	400	400	400	400	400	400
33+000	34+000	700	700	700	700	700	700	700	710	710	710	710
34+000	35+000	600	600	600	600	600	600	600	600	600	600	600
35+000	36+000	-	-	-	-	-	-	-	-	-	-	-
36+000	37+000	240	240	240	240	240	240	240	240	240	240	240
37+000	38+000	1000	1000	1000	1000	185	185	185	185	185	185	185
38+000	39+000	380	380	380	380	380	380	380	380	380	380	380
39+000	40+000	500	500	500	500	500	500	500	500	500	500	500
40+000	41+000	-	-	-	-	-	-	-	-	-	-	-
41+000	42+000	-	-	-	-	-	-	-	-	-	-	-
42+000	43+000	-	-	-	-	-	-	-	-	-	-	-
<b>Total</b>		<b>20095</b>	<b>20095</b>	<b>20095</b>	<b>20095</b>	<b>16005</b>	<b>14905</b>	<b>14005</b>	<b>13925</b>	<b>13525</b>	<b>7020</b>	<b>7020</b>
<b>Balance work to be done in Metre</b>		<b>29905</b>	<b>29905</b>	<b>29905</b>	<b>33995</b>	<b>35095</b>	<b>35995</b>	<b>36075</b>	<b>36475</b>	<b>42980</b>	<b>42980</b>	<b>42980</b>

DRISA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE		ATTEMPTED HIGHWAY STRETCHES		APPROVED
DRG NO.	0	REV R0	PREPARED BY:	EE/PNU
SH.NO.	DATE : 28/12/2012	REV R1	PREPARED BY:	EE/PNU
SCALE		CEG I.L.D.		CE, World Bank Projects.



HORIZONTAL CURVE DETAILS  
ORISSA STATE ROAD PROJECT

Curve No.	Curve Direction	HIP Details		Total Deflection Angle	Total Deviation Angle	Design Speed (Km/Hr)	Curve Radius (m.)	Transition Length (m.)	Circular Curve Length (m.)	Tangent Distance (m.)	Apex Distance (m.)	Shift	Straight Distance from TP to PC	Superelevation (%)	Transition Start Chaining	Circular Start Chaining
		Chainage	Easting													
		D	V	Rc	Ls	Lc	Ts	Es	s	pc	e	TS	SC			
1	Left	406.618	445177.653	2327439.8	59.440	80	625	35	613.392	374.330	94.761	0.082	17.500	4.551	37.677	72.677
2	Right	1286.901	444346.195	2327012.8	48.134	80	1200	0	1008.123	535.961	114.250	0.000	0.000	2.500		750.940
3	Right	2243.435	443394.077	2327378.3	42.223	65	240	50	126.862	117.821	17.732	0.434	24.991	7.000	2100.772	2150.772
4	Left	2514.929	443299.141	2327641.2	37.194	65	200	60	69.830	97.525	11.809	0.747	29.978	7.000	2387.634	2447.634
5	Right	2875.457	442964.717	232786.6	6.205	80	800	30	56.632	58.361	1.221	0.047	15.000	3.556	2817.129	2847.129
6	Left	3213.116	442664.313	2327940.8	12.374	65	400	30	56.385	58.371	2.438	0.094	14.999	4.694	3154.877	3184.877
7	Right	3404.455	442480.549	2327994.3	15.931	65	360	35	65.097	67.892	3.650	0.142	17.499	5.216	3336.818	3371.818
8	Left	3572.132	442335.284	2328078.3	8.296	65	400	30	27.919	44.016	1.145	0.094	14.999	4.694	3528.167	3558.167
9	Right	4154.828	441798.448	2328304.9	0.860	100	10000	0	150.089	75.046	0.282	0.000	0.000	2.500	4079.783	4079.783
10	Left	4496.42	441485.555	2328441.9	0.215	100	10000	0	37.573	18.787	0.018	0.000	0.000	2.500	4477.632	4477.632
11	Left	5648.3	440428.726	2328900.1	0.625	100	5000	0	54.532	27.266	0.074	0.000	0.000	2.500	5621.034	5621.034
12	Right	6014.874	440090.831	2329042.3	2.452	100	5000	0	213.960	106.997	1.145	0.000	0.000	2.500	5907.878	5907.878
13	Right	7218.878	439001.982	2329556.2	1.431	100	10000	0	249.689	124.851	0.779	0.000	0.000	2.500	7094.026	7094.026
14	Right	7899.361	438394.03	2329861.9	6.854	100	3000	0	358.889	179.659	5.375	0.000	0.000	2.500	7719.702	7719.702
15	Left	8464.21	437921.322	2330171.7	18.222	65	240	50	26.329	63.550	3.506	0.434	24.991	7.000	8401.032	8451.032
16	Right	9688.543	436741.861	2330499.7	9.017	100	1200	40	148.847	114.623	3.780	0.056	20.000	3.704	9574.024	9614.024
17	Left	10263.337	436216.687	2330733.8	9.243	100	1000	50	111.313	105.840	3.366	0.104	24.999	4.444	10157.623	10207.623
18	Right	10795.114	435705.309	2330879.7	31.138	80	500	45	226.733	221.858	19.220	0.169	22.498	5.689	10634.764	10679.764
19	Left	11275.542	435360.162	2331219.5	43.332	80	500	45	333.144	221.197	38.191	0.169	22.498	5.689	11057.521	11102.521
20	Right	11886.946	434737.387	2331261.1	9.649	80	500	45	39.205	64.715	1.947	0.169	22.498	5.689	11822.334	11867.334
21	Left	12198.179	434433.124	2331326.6	5.547	100	1800	30	144.275	102.206	2.132	0.021	15.000	2.500	12096.004	12126.004
22	Right	12889.905	433748.957	2331423.5	37.754	80	240	90	68.145	12.491	15.127	1.404	44.947	7.000	12765.602	12855.602
23	Left	13259.176	433473.873	2331669.3	25.685	80	240	90	17.590	99.982	7.598	1.404	44.947	7.000	13160.378	13250.378
24	Left	13797.073	432968.019	2331850.9	8.287	80	800	30	85.706	72.957	2.143	0.047	15.000	3.556	13724.179	13754.179
25	Right	14045.585	432724.141	2331899	4.653	100	1500	35	86.814	78.441	1.271	0.034	17.499	2.963	13967.167	14002.166
26	Right	14686.501	432106.184	2332089.1	1.202	100	15000	0	314.777	157.394	0.826	0.000	0.000	2.500	14529.106	14529.106
27	Left	15520.659	431306.984	2332308.1	3.055	100	10000	0	533.174	266.650	3.554	0.000	0.000	2.500	15254.008	15254.008
28	Right	16040.988	430801.531	2332432.1	8.802	100	1000	50	103.631	101.974	3.062	0.104	24.999	4.444	15939.126	15989.126
29	Left	17129.401	429790.901	2332835.4	42.124	80	360	60	204.674	168.792	26.219	0.417	29.994	7.000	16964.216	17024.216
30	Right	18193.589	428776.089	2333498.4	44.012	100	600	80	380.889	282.661	47.627	0.444	39.994	7.000	17916.480	17996.480
31	Left	18718.711	428278.428	2332703.4	11.068	100	600	80	35.907	98.171	3.256	0.444	39.994	7.000	18620.752	18700.752
32	Right	19767.7	427259.608	2332951.4	2.630	65	170	70	-62.196	38.881	1.244	1.199	34.951	7.000	19693.798	19763.798
33	Left	19926.445	427129.251	2333041.3	9.980	65	170	70	-40.389	49.898	1.850	1.199	34.951	7.000	19841.602	19911.602
34	Right	20210.231	426650.018	2333087.3	15.220	65	170	70	-24.842	57.824	2.720	1.199	34.951	7.000	20117.518	20187.518
35	Left	20388.668	426711.651	2333199.5	10.748	65	170	70	-38.110	51.056	1.955	1.199	34.951	7.000	20302.676	20372.676
36	Right	20750.337	426358.088	2333273.6	11.165	100	800	30	125.892	93.198	3.859	0.047	15.000	3.556	20657.261	20687.261
37	Right	21390.68	425761.58	2333507.1	0.328	100	150000	0	858.120	429.061	0.614	0.000	0.000	2.500	20961.620	20961.620
38	Right	22911.137	424350.896	2334074.3	8.761	100	800	60	62.332	91.298	2.532	0.187	29.999	5.556	22819.955	22879.955
39	Right	24534.397	423813.406	2334389.8	4.792	100	2000	0	167.288	83.693	1.750	0.000	0.000	2.500	23450.704	23450.704
40	Left	24618.017	422929.865	2335017.4	5.464	100	3000	0	286.080	143.148	3.413	0.000	0.000	2.500	24474.869	24474.869
41	Right	25660.463	422113.348	2335498.4	7.024	100	1000	35	148.887	109.560	2.856	0.034	17.499	2.963	25450.960	25485.959
42	Left	25950.305	421801.081	2335722	0.389	100	45000	0	305.324	152.662	0.259	0.000	0.000	2.500	25797.646	25797.646
43	Right	26577.171	421297.533	2336095.4	0.978	100	10000	0	170.645	85.324	0.364	0.000	0.000	2.500	26491.845	26491.845
44	Left	27160.156	420835.223	2336450.6	0.552	100	25000	0	241.013	120.507	0.290	0.000	0.000	2.500	27039.647	27039.647



**HORIZONTAL CURVE DETAILS**  
BHADRAK-ANANDPUR (SH-53 KM 0/00 TO KM 50/00)

DRG. NO. ORSP/SEB/SH-53/MS/01  
SH. NO. D DATE REV RD  
SCALE NTS  
J.P. R.R.D.K S.G  
B.M.

**PROJECT:-**  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY AND DETAILED PROJECT PREPARATION OF PHASE-(1) ROADS FOR ORISSA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE.

**CEG CONSULTING ENGINEERS GROUP LTD.**  
E-12, Moj Colony, Malviya Nagar, Jaipur-17  
Tel: +91-141-2520899, 2521899, 2520556  
Fax: 2521348, e-mail: ceg@ceginfdia.com

**CEG**

One of the Engineers  
The Project Engineer  
World Bank Project  
O/o the E.I.C. (Civil), Odisha  
Bhubaneswar

HORIZONTAL CURVE DETAILS  
ORISSA STATE ROAD PROJECT

Curve No.	Curve Direction	HIP Details		Total Deflection Angle	Total Deviation Angle	Design Speed (Km/Hr)	Curve Radius (m)	Transition Length (m)	Circular Curve Length (m)	Tangent Distance (m)	Apex Distance (m)	Shift	Straight Distance from TP to PC	Superelevation (%)		Transition Start Chainage	Circular Start Chainage
		Chainage	Easting											Northing	e		
45	Left	28224.903	419984.664	2337091.1	1.332	100	5000	0	116.217	58.111	0.338	0.000	0.000	2.500		28166.793	
46	Left	28639.676	419647.616	2337332.8	2.821	100	2000	0	98.469	49.244	0.606	0.000	0.000	2.500		28590.432	
47	Right	28926.553	419408.288	2337490.8	5.988	65	240	50	-24.917	37.567	0.763	0.434	24.991	7.000		28864.000	
48	Left	29056.457	419321.163	2337587.1	8.281	65	240	50	-15.313	42.396	1.063	0.434	24.991	7.000		28989.083	
49	Right	29451.391	418982.876	2337790.7	15.431	65	800	0	215.462	108.387	7.309	0.000	0.000	2.500		29343.004	
50	Left	29619.039	418865.436	2337912.2	4.113	65	800	0	57.430	28.727	0.516	0.000	0.000	2.500		29590.312	
51	Right	29723.878	418788.529	2337983.4	4.919	65	300	40	-14.242	32.894	0.499	0.222	19.997	6.259		29670.991	
52	Left	29881.028	418693.513	2338108.2	7.591	65	170	70	-47.476	46.309	1.576	1.199	34.951	7.000		29799.749	
53	Right	30467.097	418167.982	2338166.6	4.263	100	1200	0	49.279	64.662	0.886	0.056	20.000	3.704		30442.454	
54	Right	31041.724	417688.469	2338650.7	0.336	100	5000	0	293.070	146.535	0.215	0.000	0.000	2.500		30895.188	
55	Left	31673.573	417121.402	2338968.8	0.912	100	5000	0	36.482	18.241	0.033	0.000	0.000	2.500		32172.359	
56	Right	32554.298	416353.239	2339397.6	0.429	100	15000	0	112.406	56.204	0.105	0.000	0.000	2.500		32498.093	
57	Right	32327.947	415760.941	2339739	1.152	100	2000	0	40.195	20.098	0.101	0.000	0.000	2.500		33217.849	
58	Left	33497.759	415538.498	2339873.3	3.024	100	2000	0	105.544	52.784	0.696	0.000	0.000	2.500		33444.975	
59	Right	33991.877	415102.551	2340105.9	1.233	100	15000	0	322.748	161.380	0.868	0.000	0.000	2.500		33830.499	
60	Right	35192.491	414503.331	2340689.2	23.155	80	360	60	85.488	103.829	7.902	0.417	29.993	7.000		35089.545	
61	Left	35714.206	413534.984	2340750.5	4.928	100	3500	0	301.039	150.613	3.239	0.000	0.000	2.500		35563.593	
62	Right	36142.524	413113.531	2340826.9	26.474	80	360	60	106.341	114.774	10.254	0.417	29.993	7.000		36028.964	
63	Left	36549.675	412716.5	2340735.3	37.791	80	300	75	122.871	140.433	17.913	0.781	37.480	7.000		36412.365	
64	Right	37300.348	412015.895	2341008.3	17.107	100	900	55	213.710	162.882	10.264	0.140	27.499	4.938		37192.988	
65	Right	37660.304	411656.885	2341045.5	1.013	100	2000	0	35.364	17.683	0.078	0.000	0.000	2.500		37642.622	
66	Left	37900.855	411417.793	2341071.9	0.378	100	5000	0	33.011	16.506	0.027	0.000	0.000	2.500		37884.350	
67	Right	38521.994	410799.987	2341136.2	0.216	100	10000	0	37.782	18.891	0.018	0.000	0.000	2.500		38503.102	
68	Right	39422.683	409904.49	2341232.8	0.751	100	5000	0	65.578	32.790	0.108	0.000	0.000	2.500		39389.893	
69	Right	40308.907	409024.695	2341339.3	0.273	100	8000	0	381.490	190.745	0.227	0.000	0.000	2.500		40118.153	
70	Right	40890.545	408447.616	2341412	1.095	100	15000	0	286.899	143.354	0.685	0.000	0.000	2.500		40747.191	
71	Right	41317.632	408022.926	2341457.3	1.180	100	15000	0	309.003	154.507	0.796	0.000	0.000	2.500		41163.124	
72	Right	41691.157	407653.561	2341510.4	27.521	65	170	70	11.657	16.676	6.258	1.199	34.951	7.000		41685.326	
73	Left	42031.748	407367.323	2341693.7	30.050	65	170	70	19.160	80.903	7.259	1.199	34.951	7.000		41952.158	
74	Left	42298.624	407103.093	2341712.9	70.228	40	50	40	21.285	55.985	12.745	1.326	19.894	7.000		42287.818	
75	Left	42529.675	406992.148	2341511.3	48.368	50	170	40	103.511	96.511	16.785	0.392	19.991	6.536		42436.259	
76	Right	42889.762	406644.953	2341407.4	37.542	80	300	75	121.571	139.705	17.678	0.781	37.480	7.000		42753.131	
77	Right	43670.238	405908.719	2341669.9	25.976	80	1200	0	544.039	276.777	31.505	0.000	0.000	2.500		43393.462	
78	Right	44496.954	405339.623	2342281.7	69.046	40	80	25	71.407	67.744	17.494	0.325	12.490	7.000		44416.924	
79	Right	44822.864	405424.066	2342391.8	19.369	40	50	40	-23.097	28.653	2.068	1.326	19.894	7.000		44574.331	
80	Left	44961.814	405343.521	2342471.9	54.491	65	150	80	62.857	118.059	20.713	1.773	39.905	7.000		44850.021	
81	Right	45916.646	405697.762	2343495.7	12.847	80	500	45	67.111	78.509	3.329	0.169	22.498	5.689		45836.040	
82	Left	46340.859	406063.042	2343886.2	25.301	100	600	80	184.953	174.767	15.384	0.444	39.995	7.000		46167.642	
83	Left	48060.978	406010.941	2345607.1	0.406	100	5000	0	354.423	177.212	0.314	0.000	0.000	2.500		47863.760	
84	Right	48426.574	406010.941	2345972.5	1.171	100	15000	0	306.676	153.343	0.784	0.000	0.000	2.500		48273.232	
85	Right	48885.747	406004.423	2346431.7	3.013	100	5000	0	262.946	131.503	1.729	0.000	0.000	2.500		48754.244	
86	Left	49548.629	406029.869	2347094.1	0.606	100	30000	0	317.214	158.608	0.419	0.000	0.000	2.500		49390.024	
87	Left	49953.457	406023.967	2347497.9	50.364	80	240	90	120.963	158.451	26.757	1.405	44.948	7.000		49891.662	

HORIZONTAL CURVE DETAILS  
BHADRAK-ANANDPUR (SH-53 KM 0/00 TO KM 50/00)

DRG NO: OSM/ESD/SH-53/M/02  
SCALE: \_\_\_\_\_  
DATE: \_\_\_\_\_  
REV: \_\_\_\_\_  
RO: \_\_\_\_\_  
J.P. B.M. NTS  
R.R.D.K S.G

PROJECT:-  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY AND DETAILED PROJECT PREPARATION  
OF PHASE-(1) ROADS FOR ORISSA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE.

**CONSULTING ENGINEERS GROUP LTD.**  
E-12, Meji Colony, Malviya Nagar Jaipur-17  
Tel: +91-141-2520899, 2521899, 2520556  
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VERTICAL CURVE DETAILS

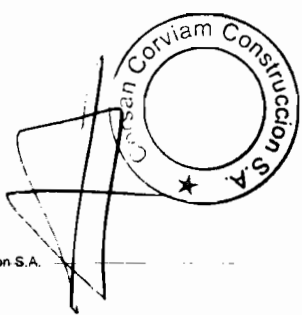
Curve No.	Curve Type	VIP Details		Curve Length m.	k	Curve Start		Curve End		Start Gradient (%)	End Gradient (%)	Grade Difference (%)		Remarks
		Chainage	Level			Chainage	Level	Chainage	Level			F	D	
1	Summit	164.59	20.449	60	543.392	134.59	20.399	194.59	20.465	0.165	0.054	0.111		
2	Valley	579.377	20.674	60	1482.88	549.377	20.658	609.377	20.703	0.054	0.095	-0.041		
3	Summit	948.976	21.024	60	2278.55	918.976	20.996	978.976	21.045	0.095	0.068	0.027		
4	Valley	2523.805	22.102	60	68.727	2493.805	22.082	2553.805	22.385	0.068	0.941	-0.873		
5	Valley	2760.296	24.329	115	43.147	2702.796	23.787	2817.796	26.403	3.607	3.607	-2.666		
6	Summit	2990.189	32.621	150	21.787	2915.189	29.915	3065.189	30.162	3.607	-3.278	6.885		
7	Valley	3239.879	24.435	70	26.946	3204.879	25.583	3274.879	24.197	-3.278	-0.68	-2.598		
8	Valley	3560.982	22.251	60	84.859	3530.982	22.455	3590.982	22.259	-0.68	0.027	-0.707		
9	Valley	4130.444	22.403	60	4225.54	4100.444	22.395	4160.444	22.415	0.027	0.041	-0.014		
10	Valley	5822.818	23.095	60	549.862	5792.818	23.082	5852.818	23.14	0.041	0.15	-0.109		
11	Summit	5991.512	23.348	60	587.233	5961.512	23.303	6021.512	23.362	0.15	0.048	0.102		
12	Valley	6226.369	23.46	60	1851.16	6196.369	23.446	6256.369	23.484	0.048	0.08	-0.032		
13	Summit	7152.576	24.203	60	593.062	7122.576	24.179	7182.576	24.197	0.08	-0.021	0.101		
14	Valley	7916.572	24.044	60	286.593	7886.572	24.05	7946.572	24.1	-0.021	0.188	-0.209		
15	Summit	8213.924	24.604	60	570.326	8183.924	24.547	8243.924	24.629	0.188	0.083	0.105		
16	Valley	8609.887	24.933	60	537.084	8579.887	24.908	8639.887	24.992	0.083	0.195	-0.112		
17	Summit	8937.544	25.572	60	761.777	8907.544	25.514	8967.544	25.607	0.195	0.116	0.079		
18	Summit	9752.791	26.519	60	367.637	9722.791	26.484	9782.791	26.505	0.116	-0.047	0.163		
19	Valley	9846.366	26.475	60	72.798	9816.366	26.489	9876.366	26.708	-0.047	0.777	-0.824		
20	Summit	9946.044	27.25	110	141.537	9891.044	26.823	10001.044	27.25	0.777	0	0.777		
21	Summit	10089.332	27.25	125	135.579	10026.832	27.25	10151.832	26.674	0	-0.922	0.922		
22	Valley	10212.078	26.118	60	59.913	10182.078	26.395	10242.078	26.142	-0.922	0.079	-1.001		
23	Summit	10721.42	28.523	75	143.935	10685.92	26.493	10758.92	26.358	0.079	-0.442	0.521		
24	Valley	10885.474	25.799	60	87.876	10855.474	25.931	10915.474	25.871	-0.442	0.241	-0.683		
25	Summit	11051.951	26.2	75	141.282	11014.451	26.11	11089.451	26.092	0.241	-0.29	0.531		
26	Valley	11213.604	25.732	70	43.099	11178.604	25.833	11248.604	26.199	-0.29	1.335	-1.625		
27	Summit	11320.613	27.16	100	74.934	11270.613	26.493	11370.613	27.16	1.335	0	1.335		
28	Summit	11526.41	27.16	160	139.21	11446.41	27.16	11606.41	26.241	0	-1.149	1.149		
29	Valley	11667.71	25.536	75	43.681	11630.21	25.967	11705.21	25.749	-1.149	0.568	-1.717		
30	Summit	11805.414	26.318	60	173.626	11775.414	26.147	11835.414	26.384	0.222	0.346	0.124		
31	Summit	11993.942	26.736	60	411.082	11963.942	26.67	12023.942	26.759	0.222	0.076	0.146		
32	Summit	13067.693	27.554	60	3761.22	13037.693	27.531	13097.693	27.572	0.076	0.06	0.016		
33	Summit	13500.087	27.814	60	393.056	13470.087	27.796	13530.087	27.786	0.06	-0.092	0.152		
34	Valley	13764.399	27.57	60	314.287	13734.399	27.597	13794.399	27.599	-0.092	0.098	-0.19		
35	Valley	14437.191	28.232	60	877.538	14407.191	28.203	14467.191	28.282	0.098	0.167	-0.069		
36	Valley	14994.811	29.162	60	276.533	14964.811	29.112	15024.811	29.277	0.167	0.384	-0.217		
37	Summit	15107.596	29.595	60	168.391	15077.596	29.48	15137.596	29.603	0.384	0.027	0.357		
38	Valley	15665.455	29.748	60	969.125	15635.455	29.74	15695.455	29.775	0.027	0.089	-0.062		
39	Valley	17046.175	30.983	60	56.156	17016.175	30.956	17076.175	31.33	0.089	1.158	-1.069		
40	Summit	17212.643	32.91	90	77.731	17167.643	32.389	17257.643	32.91	1.158	0	1.158		
41	Valley	17416.094	32.91	60	9224.56	17386.094	32.91	17446.094	32.912	0	0.007	-0.007		
42	Summit	17646.708	32.925	60	9224.56	17616.708	32.923	17676.708	32.925	0.007	0	0.007		
43	Summit	17887.14	32.925	75	74.345	17849.64	32.925	17924.64	32.547	0	-1.009	1.009		
44	Valley	18052.554	31.155	65	42.735	18030.054	31.483	18095.054	31.322	-1.009	0.512	-1.521		
45	Summit	18242.513	32.077	75	142.992	18205.013	31.885	18280.013	32.073	0.512	-0.012	0.524		
46	Valley	18525.142	32.042	60	151.661	18495.142	32.046	18555.142	32.157	-0.012	0.363	-0.395		
47	Summit	18691.478	32.68	60	156.527	18661.478	32.565	18721.478	32.68	0.363	0	0.363		
48	Valley	18988.629	32.68	60	416.196	18958.629	32.68	19018.629	32.723	0	0.144	-0.144		
49	Summit	19315.634	33.151	60	1120.18	19285.634	33.108	19345.634	33.179	0.144	0.091	0.053		
50	Valley	19526.252	33.342	60	1677.64	19496.252	33.315	19556.252	33.36	0.091	0.126	-0.035		

VERTICAL CURVE DETAILS  
 BHADRAK-ANANDPUR (SH-53 KM 0/00 TO KM 50/00)

DRG. NO. GSRP/53/SH-53/AC/01  
 SH. NO. F DATE REV RD  
 SCALE NTS  
 J.P. B.M. R.R.D.K S.G  
 CHECKED (C) APPROVED (D)

PROJECT:-  
 CONSULTANCY SERVICES FOR FEASIBILITY STUDY AND DETAILED PROJECT PREPARATION  
 OF PHASE-(1) ROADS FOR ORISSA STATE ROAD PROJECT UNDER WORLD BANK  
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Chief Engineer  
 Working on Behalf of  
 O/o the E.J.C. (Civil) Division  
 Bhubaneswar.



VERTICAL CURVE DETAILS

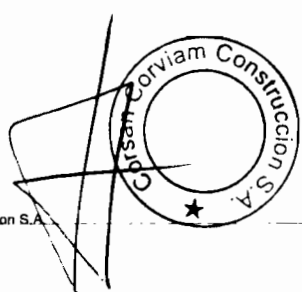
Curve No.	Curve Type	VIP Details		Curve Length m.	k	Curve Start		Curve End		Start Gradient (%)	End Gradient (%)	Grade Difference (%)	Remarks
		Chainage	Level			Chainage	Level	Chainage	Level				
51	Summit	19762.676	33.641	60	78.777	19732.676	33.603	19792.676	33.45	0.126	-0.635	0.761	
52	Valley	19853.474	33.064	60	43.538	19823.474	33.255	19883.474	33.287	-0.635	0.743	-1.378	
53	Summit	19963.858	33.884	70	78.012	19928.858	33.624	19998.858	33.83	0.743	-0.154	0.897	
54	Valley	20069.286	33.721	60	98.269	20039.286	33.768	20099.286	33.858	-0.154	0.456	-0.61	
55	Summit	20232.721	34.467	90	83.108	20187.721	34.261	20277.721	34.185	0.456	-0.627	1.083	
56	Valley	20431.244	33.222	60	71.269	20401.244	33.41	20461.244	33.287	-0.627	0.215	-0.842	
57	Summit	20611.011	33.609	60	167.396	20581.011	33.544	20641.011	33.566	0.215	-0.143	0.358	
58	Valley	20796.387	33.343	60	51.67	20766.387	33.386	20826.387	33.649	-0.143	1.018	-1.161	
59	Summit	20883.667	34.232	70	69.932	20848.667	33.875	20918.667	34.237	1.018	0.017	1.001	
60	Valley	21720.434	34.373	60	250.929	21690.434	34.368	21750.434	34.45	0.017	0.256	-0.239	
61	Summit	22096.982	35.337	60	217.369	22066.982	35.26	22126.982	35.331	0.256	-0.02	0.276	
62	Valley	22518.22	35.252	60	506.798	22488.22	35.258	22548.22	35.282	-0.02	0.098	-0.118	
63	Summit	22878.353	35.606	60	2667.35	22848.353	35.577	22908.353	35.629	0.098	0.076	0.022	
64	Valley	24393.923	36.756	60	770.158	24363.923	36.733	24423.923	36.802	0.076	0.154	-0.078	
65	Summit	24907.322	37.545	60	398.779	24877.322	37.499	24937.322	37.546	0.154	0.003	0.151	
66	Valley	25267.673	37.557	60	378.617	25237.673	37.556	25297.673	37.606	0.003	0.162	-0.159	
67	Valley	25453.858	37.858	60	286.376	25423.858	37.81	25483.858	37.97	0.162	0.371	-0.209	
68	Summit	25561.795	38.259	75	75.33	25524.295	38.12	25599.295	38.025	0.371	-0.624	0.995	
69	Valley	25656.885	37.666	60	92.165	25626.885	37.853	25686.885	37.674	-0.624	0.027	-0.651	
70	Valley	25968.518	37.749	60	294.971	25938.518	37.741	25998.518	37.818	0.027	0.23	-0.203	
71	Summit	26092.764	38.035	60	316.055	26062.764	37.965	26122.764	38.047	0.23	0.04	0.19	
72	Valley	26913.155	38.365	60	1962.02	26883.155	38.353	26943.155	38.386	0.04	0.071	-0.031	
73	Valley	27632.887	38.874	60	2520.38	27602.887	38.853	27662.887	38.903	0.071	0.095	-0.024	
74	Valley	28361.974	39.584	60	236.014	28331.974	39.536	28391.974	39.669	0.095	0.349	-0.254	
75	Summit	28463.791	39.92	60	232.402	28433.791	39.815	28493.791	39.947	0.349	0.091	0.258	
76	Valley	28802.145	40.226	60	207.681	28772.145	40.199	28832.145	40.34	0.091	0.38	-0.289	
77	Summit	28908.931	40.632	60	186.021	28878.931	40.518	28938.931	40.649	0.38	0.057	0.323	
78	Summit	29235.524	40.818	60	1797.62	29205.524	40.801	29265.524	40.825	0.057	0.024	-0.075	
79	Valley	29494.021	40.879	60	791.79	29464.021	40.872	29524.021	40.909	0.024	0.099	-0.075	
80	Valley	29591.232	40.976	60	3257.71	29561.232	40.946	29621.232	41.011	0.099	0.118	-0.019	
81	Summit	29842.189	41.272	60	449.951	29812.189	41.236	29872.189	41.267	0.118	-0.015	0.133	
82	Summit	30023.269	41.244	60	960.532	29993.269	41.248	30053.269	41.22	-0.015	-0.078	0.063	
83	Valley	30156.067	41.14	60	969.842	30126.067	41.164	30186.067	41.135	-0.078	-0.016	-0.062	
84	Valley	30504.372	41.084	60	132.324	30474.372	41.089	30534.372	41.215	-0.016	0.437	-0.453	
85	Summit	30572.021	41.38	60	137.191	30542.021	41.249	30602.021	41.38	0.437	0	0.437	
86	Valley	30684.026	41.38	60	474.788	30654.026	41.38	30714.026	41.418	0	0.126	-0.126	
87	Summit	30781.29	41.503	60	595.561	30751.29	41.465	30811.29	41.511	0.126	0.026	0.1	
88	Valley	30973.512	41.552	60	136.386	30943.512	41.544	31003.512	41.692	0.026	0.466	-0.44	
89	Summit	31082.335	42.059	70	136.262	31047.335	41.896	31117.335	42.042	0.466	-0.048	0.514	
90	Valley	31390.478	41.91	60	167.378	31360.478	41.925	31420.478	42.003	-0.048	0.31	-0.358	
91	Summit	31485.588	42.206	60	228.543	31455.588	42.112	31515.588	42.22	0.31	0.048	0.262	
92	Summit	31711.891	42.314	60	1822.17	31681.891	42.299	31741.891	42.318	0.048	0.015	0.033	
93	Summit	32123.53	42.375	60	1001.23	32093.53	42.37	32153.53	42.361	0.015	-0.045	0.06	
94	Valley	32263.994	42.311	60	449.572	32233.994	42.325	32293.994	42.338	-0.045	0.068	-0.133	
95	Valley	32816.701	42.8	60	279.783	32786.701	42.773	32846.701	42.891	0.068	0.303	-0.215	
96	Summit	32964.249	43.247	60	165.053	32934.249	43.156	32994.249	43.229	0.303	-0.061	0.364	
97	Valley	33215.293	43.094	60	939.939	33185.293	43.113	33245.293	43.095	-0.061	0.003	-0.064	
98	Valley	33519.254	43.104	60	547.42	33489.254	43.103	33549.254	43.138	0.003	0.113	-0.11	
99	Summit	33835.225	43.46	60	2622.93	33805.225	43.426	33865.225	43.487	0.113	0.09	0.023	
100	Summit	34460.665	44.022	60	945.013	34430.665	43.995	34490.665	44.03	0.09	0.026	0.064	

VERTICAL CURVE DETAILS  
 BHADRAK-ANANDPUR (SH-53 KM 0/00 TO KM 50/00)

PROJECT:-  
 CONSULTANCY SERVICES FOR FEASIBILITY STUDY AND DETAILED PROJECT PREPARATION  
 OF PHASE-(1) ROADS FOR ORISSA STATE ROAD PROJECT UNDER WORLD BANK  
 ASSISTANCE.

**CONSULTING ENGINEERS GROUP LTD.**  
 E-12, Moj Colony, Marviya Nagar Jaipur-17  
 Tel: +91-141-2520899, 2521899, 2520556  
 Fax: 2521348, e-mail: ceg@cegltdia.com

SCALE: NTS  
 J.P. B.M. R.R.D.K. S.G.  
 DESIGNED (A) DRAWN (B) CHECKED (C) APPROVED (D)



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

VERTICAL CURVE DETAILS

Curve No.	Curve Type	VIP Details		Curve Length m.	k	Curve Start		Curve End		Start Gradient (%)	End Gradient (%)	Grade Difference		Remarks
		Chainage	Level			Chainage	Level	Chainage	Level			Start (%)	End (%)	
101	Summit	35135.326	44.2	105	60.387	35082.826	44.187	35187.826	43.301	0.026	-1.712	1.738		
102	Valley	35249.152	42.251	80	41.792	35209.152	42.936	35289.152	42.332	-1.712	0.202	-1.914		
103	Summit	35825.262	43.414	150	76.788	35750.262	43.263	35900.262	42.1	0.202	-1.752	1.954		
104	Valley	36051.554	39.45	130	43.422	35986.554	40.589	36116.554	40.258	-1.752	1.242	-2.994		
105	Summit	36367.904	43.38	200	84.86	36267.904	42.138	36467.904	42.26	1.242	0	-1.12		
106	Valley	36643.815	40.29	60	53.567	36613.815	40.626	36673.815	40.29	-1.12	0	-0.559		
107	Valley	37002.154	40.29	60	107.422	36972.154	40.29	37032.154	40.458	0	0.559	0		
108	Summit	37066.607	40.65	60	107.422	37036.607	40.482	37096.607	40.65	0.559	0	0.559		
109	Valley	37174.48	40.65	60	204.906	37144.48	40.65	37204.48	40.738	0	0.293	-0.293		
110	Summit	37235.952	40.83	60	204.906	37205.952	40.742	37265.952	40.83	0.293	0	0.293		
111	Summit	37340.249	40.83	60	292.645	37310.249	40.83	37370.249	40.768	0	-0.205	0.205		
112	Valley	37501.204	40.5	60	292.645	37471.204	40.562	37531.204	40.5	-0.205	0	-0.205		
113	Summit	37628.846	40.5	60	422.345	37598.846	40.5	37658.846	40.457	0	-0.142	0.142		
114	Summit	37782.071	40.279	60	372.36	37752.071	40.322	37812.071	40.189	-0.142	-0.303	0.161		
115	Valley	37933.952	39.819	60	233.389	37903.952	39.537	37963.952	39.805	-0.303	-0.046	-0.257		
116	Valley	38576.443	39.523	60	1301.46	38546.443	39.537	38606.443	39.523	-0.046	0	-0.046		
117	Summit	38908.887	39.523	60	2492.11	38878.887	39.523	38938.887	39.515	0	-0.024	0.024		
118	Valley	39279.022	39.433	60	235.747	39249.022	39.441	39309.022	39.503	-0.024	0.23	-0.254		
119	Summit	39526.15	40.003	60	359.733	39496.15	39.934	39556.15	40.022	0.23	0.064	0.166		
120	Valley	40435.831	40.582	105	42.818	40383.331	40.548	40488.331	41.903	0.064	2.516	-2.452		
121	Summit	40610.172	44.968	166.859	33	40526.742	42.869	40693.602	42.848	2.516	-2.54	5.056		
122	Valley	40763.796	41.065	110	41.661	40708.796	42.462	40818.796	41.12	-2.54	0.1	-2.64		
123	Valley	41148.132	41.449	85	42.484	41105.632	41.407	41190.632	42.342	0.1	2.101	-2.001		
124	Summit	41330.524	45.281	160	33.105	41250.524	43.6	41410.524	43.095	2.101	-2.733	4.834		
125	Valley	41498.442	40.692	120	26.534	41438.442	42.332	41588.442	41.766	-2.733	1.79	-4.523		
126	Summit	41601.05	42.529	65	33.286	41568.55	41.947	41633.55	42.476	1.79	-0.163	1.953		
127	Valley	42107.556	41.704	65	36.392	42075.056	41.757	42140.056	42.232	-0.163	1.623	-1.786		
128	Summit	42222.514	43.571	65	35.119	42190.014	43.043	42254.014	43.497	1.623	-0.227	1.85		
129	Valley	42334.478	43.316	80	17.738	42294.478	43.407	42374.478	45.029	-0.227	4.283	-4.51		
130	Summit	42460.898	48.73	80	18.68	42420.898	47.017	42500.898	48.73	4.283	0	4.283		
131	Summit	42588.202	48.73	80	19.498	42548.202	48.73	42628.202	47.089	0	-4.103	4.103		
132	Valley	42666.217	45.529	75	18.121	42628.217	47.068	42703.217	45.543	-4.103	0.036	-4.139		
133	Valley	44502.69	46.187	105	42.565	44450.19	46.169	44555.19	47.501	0.036	2.503	-2.467		
134	Summit	44651.441	49.91	85	34.445	44608.941	48.846	44693.941	49.925	2.503	0.035	2.468		
135	Summit	45207.952	50.104	90	137.319	45162.952	50.089	45252.952	49.825	0.035	-0.62	0.655		
136	Valley	45395.288	48.942	80	44.54	45355.288	49.19	45435.288	49.412	-0.62	1.176	-1.796		
137	Valley	45502.005	50.197	60	108.792	45472.005	49.844	45532.005	50.715	1.176	1.727	-0.551		
138	Summit	45605.271	51.98	95	33.371	45557.771	51.16	45652.771	51.448	1.727	-1.12	2.847		
139	Valley	45999.945	47.561	70	43.394	45964.945	47.953	46034.945	47.734	-1.12	0.494	-1.614		
140	Summit	46473.505	49.899	65	145.822	46441.005	49.738	46506.005	49.914	0.494	0.048	0.446		
141	Summit	46961.635	50.132	155	74.102	46884.135	50.095	47039.135	48.548	0.048	-2.044	2.092		
142	Valley	47133.443	46.62	65	44.175	47100.943	47.284	47165.943	46.434	-2.044	-0.573	-1.471		
143	Valley	47303.114	45.649	60	45.914	47273.114	45.821	47333.114	45.869	-0.573	0.734	-1.307		
144	Summit	47658.414	48.258	105	135.842	47605.914	47.872	47710.914	48.237	0.734	-0.039	0.773		
145	Valley	47981.046	48.133	65	44.978	47948.546	48.146	48013.546	48.39	-0.039	1.406	-1.445		
146	Summit	48195.777	51.167	105	135.138	48144.277	50.429	48249.277	51.496	1.406	0.629	0.777		
147	Summit	48358.422	52.185	175	75.341	48270.922	51.634	48445.922	50.703	0.629	-1.693	2.322		
148	Valley	48548.183	48.972	185	42.32	48455.683	50.538	48640.683	51.449	-1.693	2.678	-4.371		
149	Summit	48748.681	54.341	195	74.266	48651.181	51.73	48846.181	54.392	2.678	0.052	2.626		
150	Summit	49706.874	54.844	115	135.439	49649.374	54.814	49764.374	54.386	0.052	-0.797	0.849		

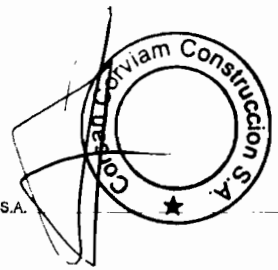
PROJECT:-

VERTICAL CURVE DETAILS  
BHADRAK-ANANDPUR (SH-53 KM 0/00 TO KM 50/00)

CONSULTANCY SERVICES FOR FEASIBILITY STUDY AND DETAILED PROJECT PREPARATION  
OF PHASE-(I) ROADS FOR ORISSA STATE ROAD PROJECT UNDER WORLD BANK  
ASSISTANCE.

**CONSULTING ENGINEERS GROUP LTD.**  
E-12, Moji Colony, Malviya Nagar Jaipur-17  
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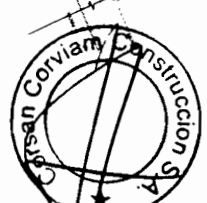
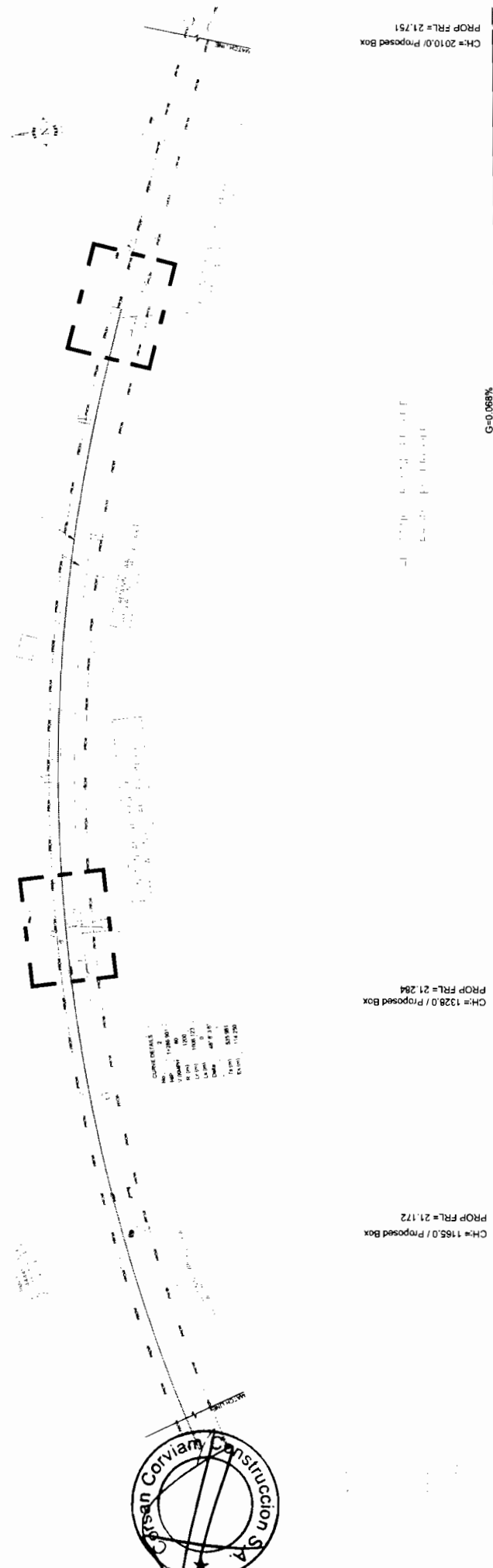
DRG NO.	DATE	REV	RO	DESIGNED (A)	DRAWN (B)	CHECKED (C)	APPROVED (D)
SH. NO.	H	DATE	REV	RO	B.M.	J.P.	R.R.D.K
SCALE				NTS			



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



CH= 1328.0 / Proposed Box



DATUM = 10.00

STATION	PROPOSED ROAD LEVEL (m)	EXISTING GROUND LEVEL (m)
21,000	10.00	10.00
21,005	10.00	10.00
21,010	10.00	10.00
21,015	10.00	10.00
21,020	10.00	10.00
21,025	10.00	10.00
21,030	10.00	10.00
21,035	10.00	10.00
21,040	10.00	10.00
21,045	10.00	10.00
21,050	10.00	10.00
21,055	10.00	10.00
21,060	10.00	10.00
21,065	10.00	10.00
21,070	10.00	10.00
21,075	10.00	10.00
21,080	10.00	10.00
21,085	10.00	10.00
21,090	10.00	10.00
21,095	10.00	10.00
21,100	10.00	10.00
21,105	10.00	10.00
21,110	10.00	10.00
21,115	10.00	10.00
21,120	10.00	10.00
21,125	10.00	10.00
21,130	10.00	10.00
21,135	10.00	10.00
21,140	10.00	10.00
21,145	10.00	10.00
21,150	10.00	10.00
21,155	10.00	10.00
21,160	10.00	10.00
21,165	10.00	10.00
21,170	10.00	10.00
21,175	10.00	10.00
21,180	10.00	10.00
21,185	10.00	10.00
21,190	10.00	10.00
21,195	10.00	10.00
21,200	10.00	10.00
21,205	10.00	10.00
21,210	10.00	10.00
21,215	10.00	10.00
21,220	10.00	10.00
21,225	10.00	10.00
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21,235	10.00	10.00
21,240	10.00	10.00
21,245	10.00	10.00
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21,260	10.00	10.00
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21,275	10.00	10.00
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21,290	10.00	10.00
21,295	10.00	10.00
21,300	10.00	10.00
21,305	10.00	10.00
21,310	10.00	10.00
21,315	10.00	10.00
21,320	10.00	10.00
21,325	10.00	10.00
21,330	10.00	10.00
21,335	10.00	10.00
21,340	10.00	10.00
21,345	10.00	10.00
21,350	10.00	10.00
21,355	10.00	10.00
21,360	10.00	10.00
21,365	10.00	10.00
21,370	10.00	10.00
21,375	10.00	10.00
21,380	10.00	10.00
21,385	10.00	10.00
21,390	10.00	10.00
21,395	10.00	10.00
21,400	10.00	10.00
21,405	10.00	10.00
21,410	10.00	10.00
21,415	10.00	10.00
21,420	10.00	10.00
21,425	10.00	10.00
21,430	10.00	10.00
21,435	10.00	10.00
21,440	10.00	10.00
21,445	10.00	10.00
21,450	10.00	10.00
21,455	10.00	10.00
21,460	10.00	10.00
21,465	10.00	10.00
21,470	10.00	10.00
21,475	10.00	10.00
21,480	10.00	10.00
21,485	10.00	10.00
21,490	10.00	10.00
21,495	10.00	10.00
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21,505	10.00	10.00
21,510	10.00	10.00
21,515	10.00	10.00
21,520	10.00	10.00
21,525	10.00	10.00
21,530	10.00	10.00
21,535	10.00	10.00
21,540	10.00	10.00
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21,550	10.00	10.00
21,555	10.00	10.00
21,560	10.00	10.00
21,565	10.00	10.00
21,570	10.00	10.00
21,575	10.00	10.00
21,580	10.00	10.00
21,585	10.00	10.00
21,590	10.00	10.00
21,595	10.00	10.00
21,600	10.00	10.00
21,605	10.00	10.00
21,610	10.00	10.00
21,615	10.00	10.00
21,620	10.00	10.00
21,625	10.00	10.00
21,630	10.00	10.00
21,635	10.00	10.00
21,640	10.00	10.00
21,645	10.00	10.00
21,650	10.00	10.00
21,655	10.00	10.00
21,660	10.00	10.00
21,665	10.00	10.00
21,670	10.00	10.00
21,675	10.00	10.00
21,680	10.00	10.00
21,685	10.00	10.00
21,690	10.00	10.00
21,695	10.00	10.00
21,700	10.00	10.00
21,705	10.00	10.00
21,710	10.00	10.00
21,715	10.00	10.00
21,720	10.00	10.00
21,725	10.00	10.00
21,730	10.00	10.00
21,735	10.00	10.00
21,740	10.00	10.00
21,745	10.00	10.00
21,750	10.00	10.00
21,751	10.00	10.00

**WIDENING AND STRENGTHENING TO TWO LANE PLAN AND LONGITUDINAL SECTION**  
BHUPAIK TO ANANDPUR BALANCE WORK (SH-53) KM/1000 TO 2000

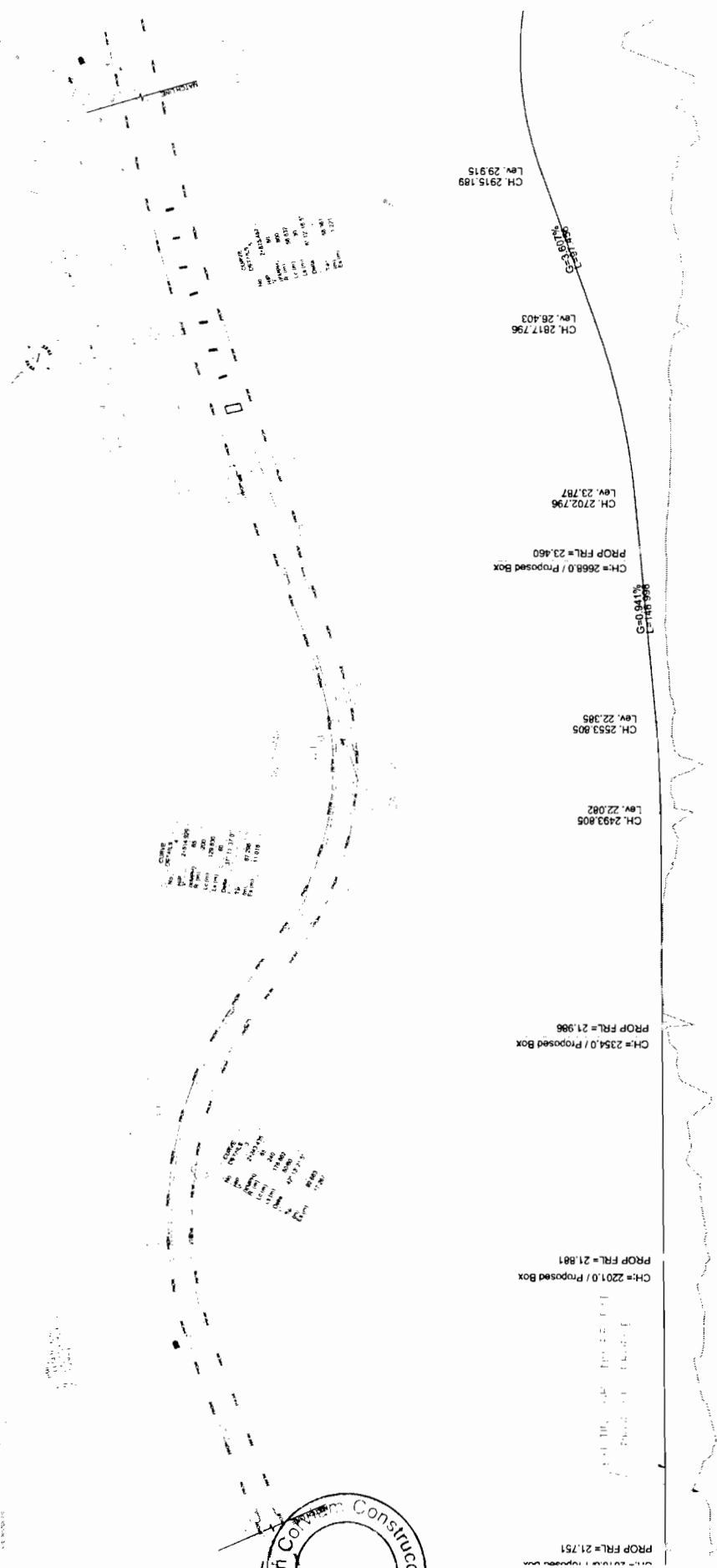
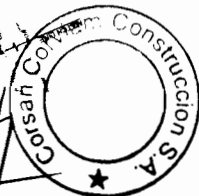
**PROJECT:-**  
**CORSAN CORVIAM ENGINEERING & CONSULTANTS**  
E-12, Major Colony, Melviya Nagar, Bhubaneswar-751 017  
Tel: +91-674-2520899, 2521889, 2520556  
Fax: 2521346, e-mail: cce@corviam.com

**LEGEND**

- Proposed Road Level
- Existing Ground Level
- Proposed Road Width
- Proposed Road Length
- Proposed Road Area
- Proposed Road Volume
- Proposed Road Weight
- Proposed Road Mass
- Proposed Road Energy
- Proposed Road Power
- Proposed Road Force
- Proposed Road Pressure
- Proposed Road Stress
- Proposed Road Strain
- Proposed Road Displacement
- Proposed Road Velocity
- Proposed Road Acceleration
- Proposed Road Frequency
- Proposed Road Wavelength
- Proposed Road Amplitude
- Proposed Road Phase
- Proposed Road Period
- Proposed Road Cycle
- Proposed Road Oscillation
- Proposed Road Vibration
- Proposed Road Resonance
- Proposed Road Damping
- Proposed Road Impedance
- Proposed Road Admittance
- Proposed Road Reactance
- Proposed Road Susceptance
- Proposed Road Inductance
- Proposed Road Capacitance
- Proposed Road Resistance
- Proposed Road Conductance
- Proposed Road Impedance
- Proposed Road Admittance
- Proposed Road Reactance
- Proposed Road Susceptance
- Proposed Road Inductance
- Proposed Road Capacitance
- Proposed Road Resistance
- Proposed Road Conductance

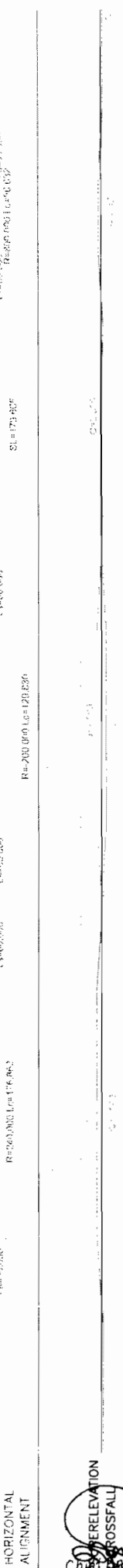
**SCALE**  
HORIZONTAL: 1:1000  
VERTICAL: 1:100

**DATE** 10/10/10  
**REV** 1/1  
**CEG** 1/1  
**EE, PNU** 1/1  
**CE, WBP** 1/1



DATUM = 14.00  
PROPOSED ROAD LEVEL (m)

Stationing	Proposed Road Level (m)	Existing Ground Level (m)
21.741	21.741	21.741
21.758	21.758	21.758
21.771	21.771	21.771
21.785	21.785	21.785
21.799	21.799	21.799
21.812	21.812	21.812
21.826	21.826	21.826
21.840	21.840	21.840
21.853	21.853	21.853
21.867	21.867	21.867
21.881	21.881	21.881
21.894	21.894	21.894
21.908	21.908	21.908
21.922	21.922	21.922
21.936	21.936	21.936
21.950	21.950	21.950
21.963	21.963	21.963
21.977	21.977	21.977
21.990	21.990	21.990
22.004	22.004	22.004
22.018	22.018	22.018
22.031	22.031	22.031
22.045	22.045	22.045
22.059	22.059	22.059
22.072	22.072	22.072
22.086	22.086	22.086
22.100	22.100	22.100
22.113	22.113	22.113
22.127	22.127	22.127
22.140	22.140	22.140
22.154	22.154	22.154
22.168	22.168	22.168
22.181	22.181	22.181
22.195	22.195	22.195
22.209	22.209	22.209
22.222	22.222	22.222
22.236	22.236	22.236
22.250	22.250	22.250
22.264	22.264	22.264
22.277	22.277	22.277
22.291	22.291	22.291
22.305	22.305	22.305
22.318	22.318	22.318
22.332	22.332	22.332
22.346	22.346	22.346
22.359	22.359	22.359
22.373	22.373	22.373
22.387	22.387	22.387
22.400	22.400	22.400
22.414	22.414	22.414
22.428	22.428	22.428
22.441	22.441	22.441
22.455	22.455	22.455
22.469	22.469	22.469
22.482	22.482	22.482
22.496	22.496	22.496
22.510	22.510	22.510
22.523	22.523	22.523
22.537	22.537	22.537
22.551	22.551	22.551
22.564	22.564	22.564
22.578	22.578	22.578
22.592	22.592	22.592
22.605	22.605	22.605
22.619	22.619	22.619
22.633	22.633	22.633
22.646	22.646	22.646
22.660	22.660	22.660
22.674	22.674	22.674
22.688	22.688	22.688
22.701	22.701	22.701
22.715	22.715	22.715
22.729	22.729	22.729
22.742	22.742	22.742
22.756	22.756	22.756
22.770	22.770	22.770
22.784	22.784	22.784
22.797	22.797	22.797
22.811	22.811	22.811
22.825	22.825	22.825
22.838	22.838	22.838
22.852	22.852	22.852
22.866	22.866	22.866
22.879	22.879	22.879
22.893	22.893	22.893
22.907	22.907	22.907
22.920	22.920	22.920
22.934	22.934	22.934
22.948	22.948	22.948
22.961	22.961	22.961
22.975	22.975	22.975
22.989	22.989	22.989
23.002	23.002	23.002
23.016	23.016	23.016
23.030	23.030	23.030
23.043	23.043	23.043
23.057	23.057	23.057
23.071	23.071	23.071
23.084	23.084	23.084
23.098	23.098	23.098
23.112	23.112	23.112
23.125	23.125	23.125
23.139	23.139	23.139
23.153	23.153	23.153
23.166	23.166	23.166
23.180	23.180	23.180
23.194	23.194	23.194
23.207	23.207	23.207
23.221	23.221	23.221
23.235	23.235	23.235
23.248	23.248	23.248
23.262	23.262	23.262
23.276	23.276	23.276
23.289	23.289	23.289
23.303	23.303	23.303
23.317	23.317	23.317
23.330	23.330	23.330
23.344	23.344	23.344
23.358	23.358	23.358
23.371	23.371	23.371
23.385	23.385	23.385
23.399	23.399	23.399
23.412	23.412	23.412
23.426	23.426	23.426
23.440	23.440	23.440
23.453	23.453	23.453
23.467	23.467	23.467
23.481	23.481	23.481
23.494	23.494	23.494
23.508	23.508	23.508
23.522	23.522	23.522
23.535	23.535	23.535
23.549	23.549	23.549
23.563	23.563	23.563
23.576	23.576	23.576
23.590	23.590	23.590
23.604	23.604	23.604
23.617	23.617	23.617
23.631	23.631	23.631
23.645	23.645	23.645
23.658	23.658	23.658
23.672	23.672	23.672
23.686	23.686	23.686
23.699	23.699	23.699
23.713	23.713	23.713
23.727	23.727	23.727
23.740	23.740	23.740
23.754	23.754	23.754
23.768	23.768	23.768
23.781	23.781	23.781
23.795	23.795	23.795
23.809	23.809	23.809
23.822	23.822	23.822
23.836	23.836	23.836
23.850	23.850	23.850
23.863	23.863	23.863
23.877	23.877	23.877
23.891	23.891	23.891
23.904	23.904	23.904
23.918	23.918	23.918
23.932	23.932	23.932
23.945	23.945	23.945
23.959	23.959	23.959
23.973	23.973	23.973
23.986	23.986	23.986
24.000	24.000	24.000



**WIDENING AND STRENGTHENING TO TWO LANE**

**PROJECT:-**  
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

**CONSULTING ENGINEER, WBPROUP LTD.**

**CEG**

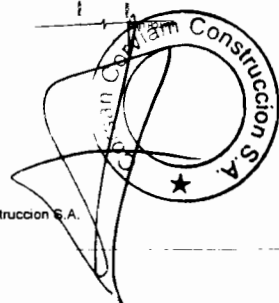
DATE: 18.01.13  
SCALE: HORIZONTAL: 1:2000, VERTICAL: 1:200

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

World Bank Project No. OD/01/018  
O/o the E.I.C. Odisha  
Bhubaneswar.







DATE: 18.01.13  
BY: [Signature]  
SCALE: 1:1000  
PROJECT: ODISHA STATE ROAD PROJECT  
DRAWING NO: CH-5960-683  
REV: 23.482



CH=5122.0 / Proposed Box  
PROP FRL=23.042

CH-5960-683  
REV: 23.482  
CH-5960-683  
REV: 23.509

DATUM = 10.00

PROPOSED ROAD LEVEL (m)

Stationing	Proposed Road Level (m)
2097	22.978
2100	23.003
2105	23.015
2110	23.020
2115	23.042
2120	23.055
2125	23.068
2130	23.081
2135	23.094
2140	23.107
2145	23.120
2150	23.133
2155	23.146
2160	23.159
2165	23.171
2170	23.184
2175	23.197
2180	23.210
2185	23.223
2190	23.236
2195	23.249
2200	23.262
2205	23.275
2210	23.288
2215	23.301
2220	23.314
2225	23.327
2230	23.340
2235	23.352
2240	23.365
2245	23.378
2250	23.391
2255	23.404
2260	23.417
2265	23.430
2270	23.443
2275	23.456
2280	23.469
2285	23.482
2290	23.495
2295	23.508
2300	23.521
2305	23.534
2310	23.547
2315	23.560
2320	23.573
2325	23.586
2330	23.599
2335	23.612
2340	23.625
2345	23.638
2350	23.651
23546	23.664

HORIZONTAL ALIGNMENT

SUPERELEVATION  
CROSSFALL  
DRAINAGE

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

**CONSULTING PROJECT:-**  
**ENGINEER, WBPROUP LTD.**  
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

**WIDENING AND STRENGTHENING TO TWO LANE**

BRIDGE TO ANANDIPUR BALANCE WORK(SH-53) KM 5300 TO 6000

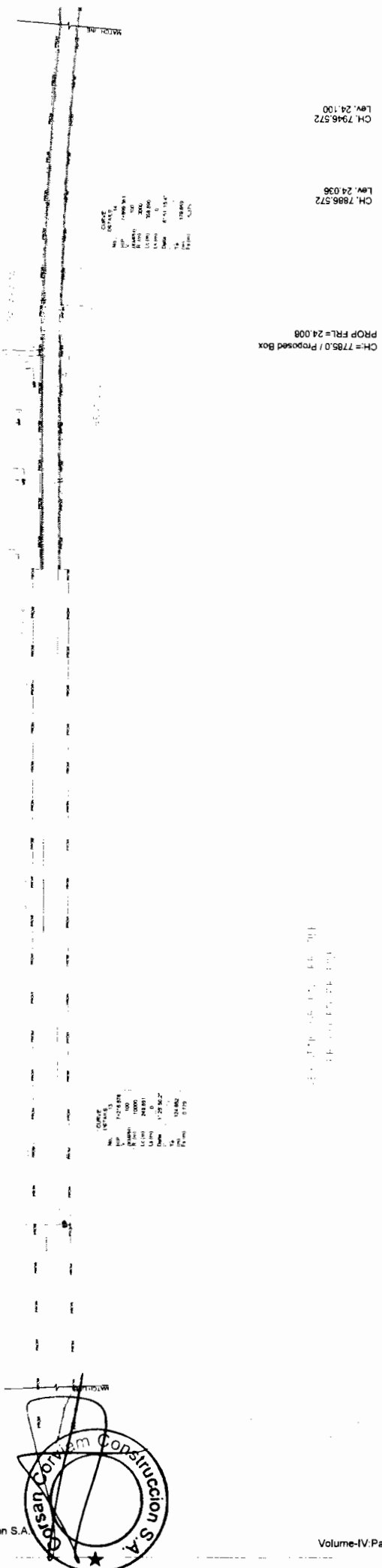
DRG NO: [ ] DATE: 18.01.13 REV: R1  
SH NO: [ ]  
SCALE: HORIZONTAL: 1:1000  
VERTICAL: 1:200

CEWP

LEGEND:  
 RADIUS OF SPHERICAL CURVE  
 RADIUS OF CIRCULAR CURVE  
 POINT OF CURVE  
 END OF SPHERICAL CURVE  
 HORIZONTAL INTERSECTION POINT  
 LENGTH OF SPHERICAL CURVE  
 LENGTH OF CIRCULAR CURVE  
 POINT OF TANGENCY  
 CHORD BEHIND  
 POINT OF CURVE







COMPASS  
DETAILS

No.	1999/91
Year	2000
Station	100.000
Station	100.000
Station	100.000
Station	100.000
Station	100.000
Station	100.000
Station	100.000
Station	100.000
Station	100.000
Station	100.000

LEVELS

Station	100.000
Station	100.000
Station	100.000
Station	100.000
Station	100.000
Station	100.000
Station	100.000
Station	100.000
Station	100.000
Station	100.000

CH= 7896.572 / Proposed Box  
PROP FRL= 24.008

CH. 7946.572  
LW. 24.100

STATIONING	PROPOSED ROAD LEVEL (m)	EXISTING ROAD LEVEL (m)	PROPOSED ROAD LEVEL (m)	EXISTING ROAD LEVEL (m)
23.895	12.00	12.00	12.00	12.00
23.911	12.00	12.00	12.00	12.00
23.916	12.00	12.00	12.00	12.00
23.921	12.00	12.00	12.00	12.00
23.926	12.00	12.00	12.00	12.00
23.931	12.00	12.00	12.00	12.00
23.937	12.00	12.00	12.00	12.00
23.942	12.00	12.00	12.00	12.00
23.947	12.00	12.00	12.00	12.00
23.952	12.00	12.00	12.00	12.00
23.957	12.00	12.00	12.00	12.00
23.963	12.00	12.00	12.00	12.00
23.968	12.00	12.00	12.00	12.00
23.973	12.00	12.00	12.00	12.00
23.978	12.00	12.00	12.00	12.00
23.983	12.00	12.00	12.00	12.00
23.989	12.00	12.00	12.00	12.00
23.994	12.00	12.00	12.00	12.00
23.999	12.00	12.00	12.00	12.00
24.004	12.00	12.00	12.00	12.00
24.009	12.00	12.00	12.00	12.00
24.013	12.00	12.00	12.00	12.00
24.018	12.00	12.00	12.00	12.00
24.024	12.00	12.00	12.00	12.00
24.029	12.00	12.00	12.00	12.00
24.034	12.00	12.00	12.00	12.00
24.042	12.00	12.00	12.00	12.00
24.046	12.00	12.00	12.00	12.00
24.048	12.00	12.00	12.00	12.00
24.125	12.00	12.00	12.00	12.00
24.153	12.00	12.00	12.00	12.00
24.201	12.00	12.00	12.00	12.00

REF: 0.00 LEVEL (m)

SL: 575.985

R=1100.00 L=248.851

HORIZONTAL ALIGNMENT

VERTICAL ALIGNMENT

STATIONING	PROPOSED ROAD LEVEL (m)	EXISTING ROAD LEVEL (m)	PROPOSED ROAD LEVEL (m)	EXISTING ROAD LEVEL (m)
7+000	12.00	12.00	12.00	12.00
7+020	12.00	12.00	12.00	12.00
7+040	12.00	12.00	12.00	12.00
7+060	12.00	12.00	12.00	12.00
7+080	12.00	12.00	12.00	12.00
7+100	12.00	12.00	12.00	12.00
7+120	12.00	12.00	12.00	12.00
7+140	12.00	12.00	12.00	12.00
7+160	12.00	12.00	12.00	12.00
7+180	12.00	12.00	12.00	12.00
7+200	12.00	12.00	12.00	12.00
7+220	12.00	12.00	12.00	12.00
7+240	12.00	12.00	12.00	12.00
7+260	12.00	12.00	12.00	12.00
7+280	12.00	12.00	12.00	12.00
7+300	12.00	12.00	12.00	12.00
7+320	12.00	12.00	12.00	12.00
7+340	12.00	12.00	12.00	12.00
7+360	12.00	12.00	12.00	12.00
7+380	12.00	12.00	12.00	12.00
7+400	12.00	12.00	12.00	12.00
7+420	12.00	12.00	12.00	12.00
7+440	12.00	12.00	12.00	12.00
7+460	12.00	12.00	12.00	12.00
7+480	12.00	12.00	12.00	12.00
7+500	12.00	12.00	12.00	12.00
7+520	12.00	12.00	12.00	12.00
7+540	12.00	12.00	12.00	12.00
7+560	12.00	12.00	12.00	12.00
7+580	12.00	12.00	12.00	12.00
7+600	12.00	12.00	12.00	12.00
7+620	12.00	12.00	12.00	12.00
7+640	12.00	12.00	12.00	12.00
7+660	12.00	12.00	12.00	12.00
7+680	12.00	12.00	12.00	12.00
7+700	12.00	12.00	12.00	12.00
7+720	12.00	12.00	12.00	12.00
7+740	12.00	12.00	12.00	12.00
7+760	12.00	12.00	12.00	12.00
7+780	12.00	12.00	12.00	12.00
7+800	12.00	12.00	12.00	12.00
7+820	12.00	12.00	12.00	12.00
7+840	12.00	12.00	12.00	12.00
7+860	12.00	12.00	12.00	12.00
7+880	12.00	12.00	12.00	12.00
7+900	12.00	12.00	12.00	12.00
7+920	12.00	12.00	12.00	12.00
7+940	12.00	12.00	12.00	12.00
7+960	12.00	12.00	12.00	12.00
7+980	12.00	12.00	12.00	12.00
8+000	12.00	12.00	12.00	12.00

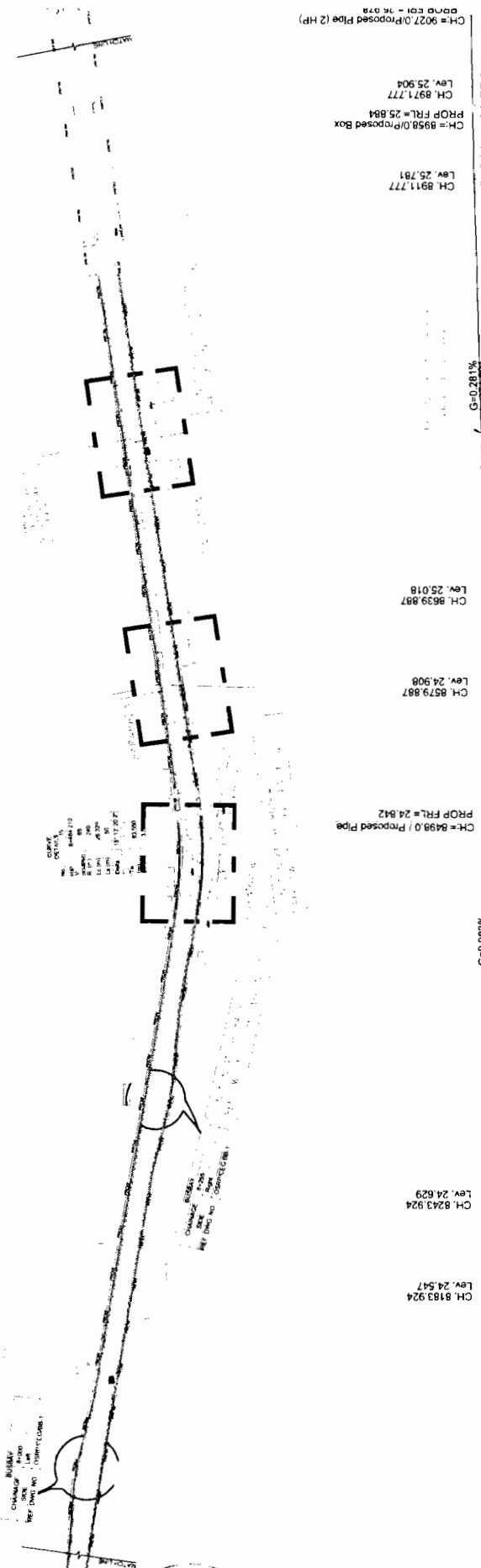
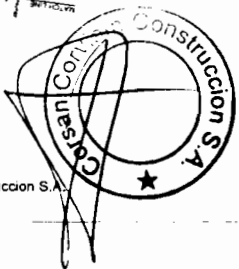
WIDENING AND STRENGTHENING TO TWO LANE

**CONSULTING ENGINEER, WBPROUP LTD**  
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE



PROJECT: WIDENING AND STRENGTHENING TO TWO LANE  
DRAWING NO. R-021  
DATE: 16.01.13  
SCALE: HORIZONTAL: 1:2000 VERTICAL: 1:200  
PROJECT: WIDENING AND STRENGTHENING TO TWO LANE  
DRAWING NO. R-021  
DATE: 16.01.13  
SCALE: HORIZONTAL: 1:2000 VERTICAL: 1:200

World Bank Project  
Oto the Employ (Civil), Odisha  
Bhubaneswar.



CH= 8927.0/Proposed Pipe (2 HP)  
CH= 8971.777  
Lev. 25.904  
CH= 8958.0/Proposed Box  
PROP FRL= 25.884  
CH= 8911.777  
Lev. 25.781

CH= 8639.887  
Lev. 25.018  
CH= 8579.887  
Lev. 24.908

CH= 8498.0/Proposed Pipe  
PROP FRL= 24.842

CH= 8243.924  
Lev. 24.629  
CH= 8183.924  
Lev. 24.547

DATUM = 10.00  
PROPOSED ROAD  
LEVEL (m)

74.50	24.238
74.75	24.278
75.00	24.314
75.25	24.351
75.50	24.389
75.75	24.427
76.00	24.465
76.25	24.502
76.50	24.540
76.75	24.575
77.00	24.604
77.25	24.629
77.50	24.659
77.75	24.692
78.00	24.709
78.25	24.725
78.50	24.742
78.75	24.759
79.00	24.775
79.25	24.792
79.50	24.809
79.75	24.825
80.00	24.842
80.25	24.859
80.50	24.875
80.75	24.892
81.00	24.908
81.25	24.925
81.50	24.942
81.75	24.958
82.00	24.974
82.25	24.991
82.50	25.008
82.75	25.024
83.00	25.041
83.25	25.057
83.50	25.073
83.75	25.089
84.00	25.105
84.25	25.121
84.50	25.137
84.75	25.153
85.00	25.169
85.25	25.185
85.50	25.201
85.75	25.217
86.00	25.233
86.25	25.249
86.50	25.265
86.75	25.281
87.00	25.297
87.25	25.313
87.50	25.329
87.75	25.345
88.00	25.361
88.25	25.377
88.50	25.393
88.75	25.409
89.00	25.425
89.25	25.441
89.50	25.457
89.75	25.473
90.00	25.489
90.25	25.505
90.50	25.521
90.75	25.537
91.00	25.553
91.25	25.569
91.50	25.585
91.75	25.601
92.00	25.617
92.25	25.633
92.50	25.649
92.75	25.665
93.00	25.681
93.25	25.697
93.50	25.713
93.75	25.729
94.00	25.745

HORIZONTAL ALIGNMENT  
SL=5.2.440  
R=240 (R/L)=20.225

CH SUPERELEVATION  
CROSSFALL  
CHAINAGE

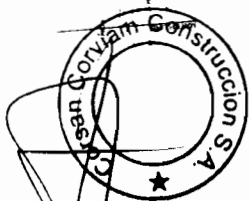
9+000	FE PMU	CE WRP
9+020	FE PMU	CE WRP
9+040	FE PMU	CE WRP
9+060	FE PMU	CE WRP
9+080	FE PMU	CE WRP
9+100	FE PMU	CE WRP
9+120	FE PMU	CE WRP
9+140	FE PMU	CE WRP
9+160	FE PMU	CE WRP
9+180	FE PMU	CE WRP
9+200	FE PMU	CE WRP
9+220	FE PMU	CE WRP
9+240	FE PMU	CE WRP
9+260	FE PMU	CE WRP
9+280	FE PMU	CE WRP
9+300	FE PMU	CE WRP
9+320	FE PMU	CE WRP
9+340	FE PMU	CE WRP
9+360	FE PMU	CE WRP
9+380	FE PMU	CE WRP
9+400	FE PMU	CE WRP
9+420	FE PMU	CE WRP
9+440	FE PMU	CE WRP
9+460	FE PMU	CE WRP
9+480	FE PMU	CE WRP
9+500	FE PMU	CE WRP
9+520	FE PMU	CE WRP
9+540	FE PMU	CE WRP
9+560	FE PMU	CE WRP
9+580	FE PMU	CE WRP
9+600	FE PMU	CE WRP
9+620	FE PMU	CE WRP
9+640	FE PMU	CE WRP
9+660	FE PMU	CE WRP
9+680	FE PMU	CE WRP
9+700	FE PMU	CE WRP
9+720	FE PMU	CE WRP
9+740	FE PMU	CE WRP
9+760	FE PMU	CE WRP
9+780	FE PMU	CE WRP
9+800	FE PMU	CE WRP
9+820	FE PMU	CE WRP
9+840	FE PMU	CE WRP
9+860	FE PMU	CE WRP
9+880	FE PMU	CE WRP
9+900	FE PMU	CE WRP
9+920	FE PMU	CE WRP
9+940	FE PMU	CE WRP
9+960	FE PMU	CE WRP
9+980	FE PMU	CE WRP
9+1000	FE PMU	CE WRP

**CONSULTING PROJECT:-**  
**ENGINEER, WB GROUP LTD.**  
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

**WIDENING AND STRENGTHENING TO TWO LANE**

SCALE: HORIZONTAL: 1:200  
VERTICAL: 1:200

REVISIONS:  
NO. DATE BY  
1. 10/11/2006  
2. 10/11/2006  
3. 10/11/2006  
4. 10/11/2006  
5. 10/11/2006



CH= 9027.0/Proposed Pipe  
PRP FRL= 25.978

CH= 10016.0/Proposed  
PRP FRL= 27.253

G=0.132%  
L=104.222

DATUM = 12.00  
PROPOSED ROAD  
LEVEL (m)

Stationing	Proposed Road Level (m)
9+000	25.978
9+020	25.978
9+040	25.978
9+060	26.021
9+080	26.048
9+100	26.074
9+120	26.101
9+140	26.127
9+160	26.154
9+180	26.180
9+200	26.207
9+220	26.233
9+240	26.260
9+260	26.286
9+280	26.313
9+300	26.339
9+320	26.366
9+340	26.392
9+360	26.419
9+380	26.445
9+400	26.472
9+420	26.498
9+440	26.525
9+460	26.551
9+480	26.578
9+500	26.604
9+520	26.631
9+540	26.657
9+560	26.684
9+580	26.710
9+600	26.737
9+620	26.763
9+640	26.790
9+660	26.816
9+680	26.843
9+700	26.869
9+720	26.896
9+740	26.922
9+760	26.949
9+780	26.975
9+800	27.002
9+820	27.028
9+840	27.055
9+860	27.081
9+880	27.108
9+900	27.134
9+920	27.161
9+940	27.187
9+960	27.214
9+980	27.240
10+000	27.269
10+020	27.294

HORIZONTAL  
ALIGNMENT

OSUPERELEVATION  
ROAD/CROSSFALL  
CHAINAGE

Stationing	OSUPERELEVATION	ROAD/CROSSFALL	CHAINAGE
9+000			
9+020			
9+040			
9+060			
9+080			
9+100			
9+120			
9+140			
9+160			
9+180			
9+200			
9+220			
9+240			
9+260			
9+280			
9+300			
9+320			
9+340			
9+360			
9+380			
9+400			
9+420			
9+440			
9+460			
9+480			
9+500			
9+520			
9+540			
9+560			
9+580			
9+600			
9+620			
9+640			
9+660			
9+680			
9+700			
9+720			
9+740			
9+760			
9+780			
9+800			
9+820			
9+840			
9+860			
9+880			
9+900			
9+920			
9+940			
9+960			
9+980			
10+000			

WIDENING AND STRENGTHENING TO TWO LANE

PROJECT:-  
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

OSUPERELEVATION  
ROAD/CROSSFALL  
CHAINAGE

DRG NO. :  
SH. NO. :  
SCALE :  
REV :  
R1  
R2  
R3  
R4  
R5  
R6  
R7  
R8  
R9  
R10  
R11  
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R96  
R97  
R98  
R99  
R100

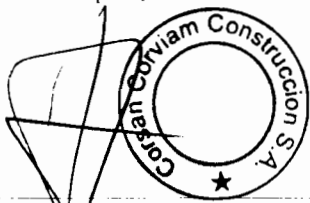
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

WIDENING AND STRENGTHENING TO TWO LANE



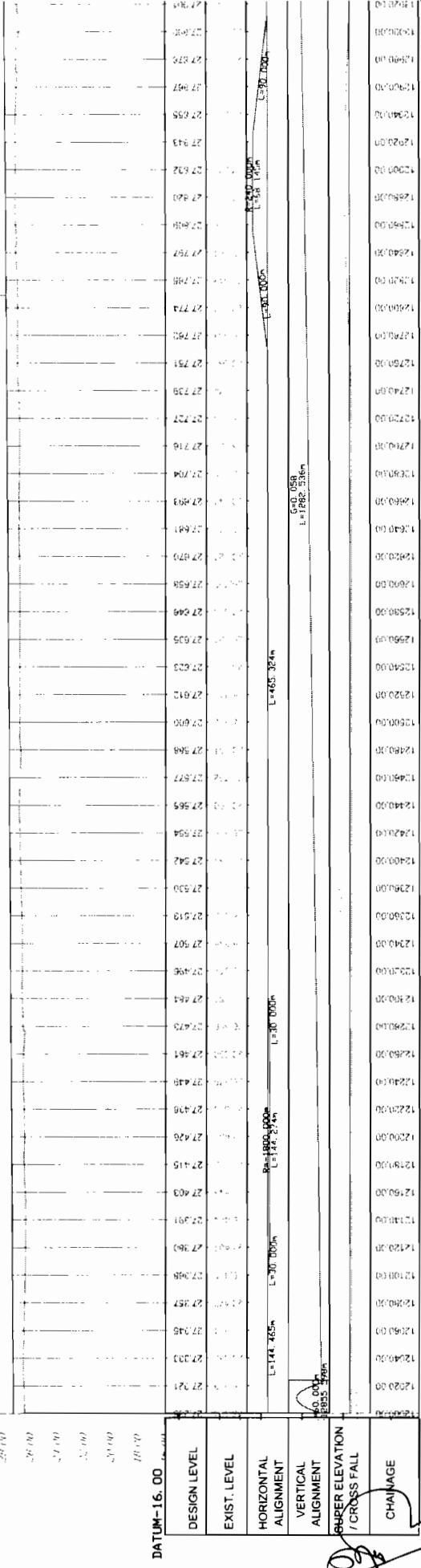


ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
1	...	...	...	...	...
2	...	...	...	...	...
3	...	...	...	...	...
4	...	...	...	...	...
5	...	...	...	...	...
6	...	...	...	...	...
7	...	...	...	...	...
8	...	...	...	...	...
9	...	...	...	...	...
10	...	...	...	...	...
11	...	...	...	...	...
12	...	...	...	...	...
13	...	...	...	...	...
14	...	...	...	...	...
15	...	...	...	...	...
16	...	...	...	...	...
17	...	...	...	...	...
18	...	...	...	...	...
19	...	...	...	...	...
20	...	...	...	...	...
21	...	...	...	...	...
22	...	...	...	...	...
23	...	...	...	...	...
24	...	...	...	...	...
25	...	...	...	...	...
26	...	...	...	...	...
27	...	...	...	...	...
28	...	...	...	...	...
29	...	...	...	...	...
30	...	...	...	...	...
31	...	...	...	...	...
32	...	...	...	...	...
33	...	...	...	...	...
34	...	...	...	...	...
35	...	...	...	...	...
36	...	...	...	...	...
37	...	...	...	...	...
38	...	...	...	...	...
39	...	...	...	...	...
40	...	...	...	...	...
41	...	...	...	...	...
42	...	...	...	...	...
43	...	...	...	...	...
44	...	...	...	...	...
45	...	...	...	...	...
46	...	...	...	...	...
47	...	...	...	...	...
48	...	...	...	...	...
49	...	...	...	...	...
50	...	...	...	...	...
51	...	...	...	...	...
52	...	...	...	...	...
53	...	...	...	...	...
54	...	...	...	...	...
55	...	...	...	...	...
56	...	...	...	...	...
57	...	...	...	...	...
58	...	...	...	...	...
59	...	...	...	...	...
60	...	...	...	...	...
61	...	...	...	...	...
62	...	...	...	...	...
63	...	...	...	...	...
64	...	...	...	...	...
65	...	...	...	...	...
66	...	...	...	...	...
67	...	...	...	...	...
68	...	...	...	...	...
69	...	...	...	...	...
70	...	...	...	...	...
71	...	...	...	...	...
72	...	...	...	...	...
73	...	...	...	...	...
74	...	...	...	...	...
75	...	...	...	...	...
76	...	...	...	...	...
77	...	...	...	...	...
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80	...	...	...	...	...
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83	...	...	...	...	...
84	...	...	...	...	...
85	...	...	...	...	...
86	...	...	...	...	...
87	...	...	...	...	...
88	...	...	...	...	...
89	...	...	...	...	...
90	...	...	...	...	...
91	...	...	...	...	...
92	...	...	...	...	...
93	...	...	...	...	...
94	...	...	...	...	...
95	...	...	...	...	...
96	...	...	...	...	...
97	...	...	...	...	...
98	...	...	...	...	...
99	...	...	...	...	...
100	...	...	...	...	...



CH=12890.0 / Proposed Pipe  
PROP FRL=27.876

CH=12980.0 / Proposed Pipe  
PROP FRL=27.876



**LEGEND**

- EXISTING CONTROL LINE
- PROPOSED CONTROL LINE
- PROPOSED CENTER LINE
- PROPOSED RIGHT OF WAY
- PROPOSED LEFT OF WAY
- PROPOSED RIGHT OF WAY
- PROPOSED LEFT OF WAY
- PROPOSED RIGHT OF WAY
- PROPOSED LEFT OF WAY
- PROPOSED RIGHT OF WAY

**PROJECT:**  
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

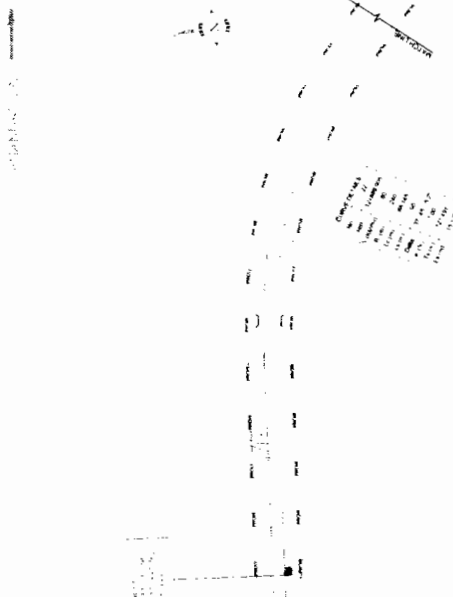
**CONSULTING ENGINEER, WB GROUP LTD.**

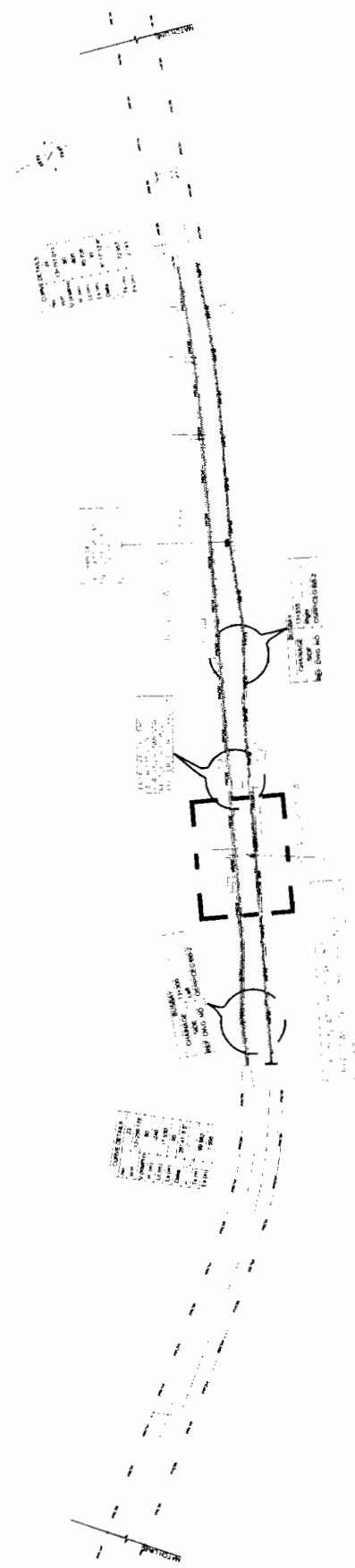
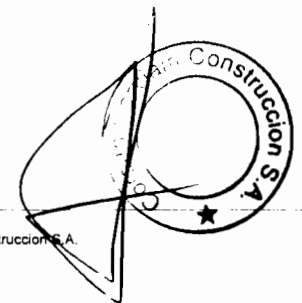
**WIDENING AND STRENGTHENING TO TWO LANE**

BRACRAT TO ANANDPUR BALAKRISHNA WORTH 53 KM 12000 TO 13000

DATE: 18.01.13 REV: R1

SCALE: HORIZONTAL: 1:2000 VERTICAL: 1:200





CH= 13909.0 / Proposed Pipe  
PROP FRL= 27.988

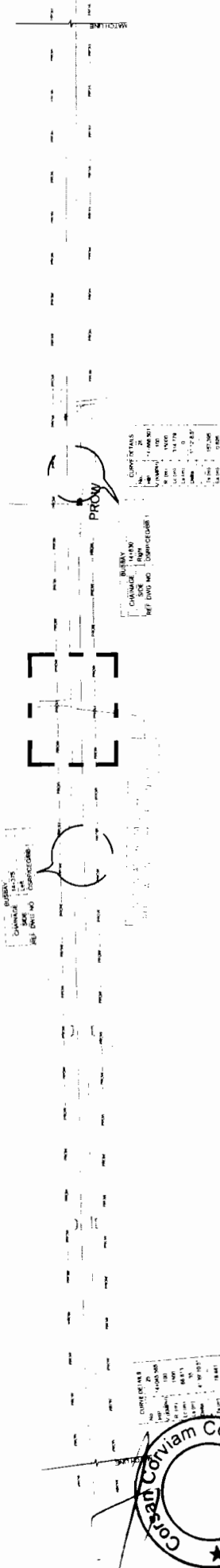
CH= 13575.0 / Proposed Pipe  
PROP FRL= 27.932

CH= 13507.0 / Proposed Pipe  
PROP FRL= 27.925

CH= 13500.0 / Proposed Pipe  
PROP FRL= 27.925

STATION	DESIGN LEVEL	EXIST. LEVEL	HORIZONTAL ALIGNMENT	VERTICAL ALIGNMENT	SUPER ELEVATION / CROSS FALL	CHAINAGE
11000.00	27.930	27.901				11000.00
11020.00	27.901	27.901				11020.00
11040.00	27.917	27.917				11040.00
11060.00	27.924	27.924				11060.00
11080.00	27.936	27.936				11080.00
11100.00	27.948	27.948				11100.00
11120.00	27.962	27.962				11120.00
11140.00	27.971	27.971				11140.00
11160.00	27.982	27.982				11160.00
11180.00	27.994	27.994				11180.00
11200.00	28.006	28.006				11200.00
11220.00	28.017	28.017				11220.00
11240.00	28.029	28.029				11240.00
11260.00	28.040	28.040				11260.00
11280.00	28.052	28.052				11280.00
11300.00	28.064	28.064				11300.00
11320.00	28.076	28.076				11320.00
11340.00	28.088	28.088				11340.00
11360.00	28.100	28.100				11360.00
11380.00	28.112	28.112				11380.00
11400.00	28.124	28.124				11400.00
11420.00	28.136	28.136				11420.00
11440.00	28.148	28.148				11440.00
11460.00	28.160	28.160				11460.00
11480.00	28.172	28.172				11480.00
11500.00	28.184	28.184				11500.00
11520.00	28.196	28.196				11520.00
11540.00	28.208	28.208				11540.00
11560.00	28.220	28.220				11560.00
11580.00	28.232	28.232				11580.00
11600.00	28.244	28.244				11600.00
11620.00	28.256	28.256				11620.00
11640.00	28.268	28.268				11640.00
11660.00	28.280	28.280				11660.00
11680.00	28.292	28.292				11680.00
11700.00	28.304	28.304				11700.00
11720.00	28.316	28.316				11720.00
11740.00	28.328	28.328				11740.00
11760.00	28.340	28.340				11760.00
11780.00	28.352	28.352				11780.00
11800.00	28.364	28.364				11800.00
11820.00	28.376	28.376				11820.00
11840.00	28.388	28.388				11840.00
11860.00	28.400	28.400				11860.00
11880.00	28.412	28.412				11880.00
11900.00	28.424	28.424				11900.00
11920.00	28.436	28.436				11920.00
11940.00	28.448	28.448				11940.00
11960.00	28.460	28.460				11960.00
11980.00	28.472	28.472				11980.00
12000.00	28.484	28.484				12000.00
12020.00	28.496	28.496				12020.00
12040.00	28.508	28.508				12040.00
12060.00	28.520	28.520				12060.00
12080.00	28.532	28.532				12080.00
12100.00	28.544	28.544				12100.00
12120.00	28.556	28.556				12120.00
12140.00	28.568	28.568				12140.00
12160.00	28.580	28.580				12160.00
12180.00	28.592	28.592				12180.00
12200.00	28.604	28.604				12200.00
12220.00	28.616	28.616				12220.00
12240.00	28.628	28.628				12240.00
12260.00	28.640	28.640				12260.00
12280.00	28.652	28.652				12280.00
12300.00	28.664	28.664				12300.00
12320.00	28.676	28.676				12320.00
12340.00	28.688	28.688				12340.00
12360.00	28.700	28.700				12360.00
12380.00	28.712	28.712				12380.00
12400.00	28.724	28.724				12400.00
12420.00	28.736	28.736				12420.00
12440.00	28.748	28.748				12440.00
12460.00	28.760	28.760				12460.00
12480.00	28.772	28.772				12480.00
12500.00	28.784	28.784				12500.00
12520.00	28.796	28.796				12520.00
12540.00	28.808	28.808				12540.00
12560.00	28.820	28.820				12560.00
12580.00	28.832	28.832				12580.00
12600.00	28.844	28.844				12600.00
12620.00	28.856	28.856				12620.00
12640.00	28.868	28.868				12640.00
12660.00	28.880	28.880				12660.00
12680.00	28.892	28.892				12680.00
12700.00	28.904	28.904				12700.00
12720.00	28.916	28.916				12720.00
12740.00	28.928	28.928				12740.00
12760.00	28.940	28.940				12760.00
12780.00	28.952	28.952				12780.00
12800.00	28.964	28.964				12800.00
12820.00	28.976	28.976				12820.00
12840.00	28.988	28.988				12840.00
12860.00	28.999	28.999				12860.00
12880.00	29.010	29.010				12880.00
12900.00	29.021	29.021				12900.00
12920.00	29.032	29.032				12920.00
12940.00	29.043	29.043				12940.00
12960.00	29.054	29.054				12960.00
12980.00	29.065	29.065				12980.00
13000.00	29.076	29.076				13000.00
13020.00	29.087	29.087				13020.00
13040.00	29.098	29.098				13040.00
13060.00	29.109	29.109				13060.00
13080.00	29.120	29.120				13080.00
13100.00	29.131	29.131				13100.00
13120.00	29.142	29.142				13120.00
13140.00	29.153	29.153				13140.00
13160.00	29.164	29.164				13160.00
13180.00	29.175	29.175				13180.00
13200.00	29.186	29.186				13200.00
13220.00	29.197	29.197				13220.00
13240.00	29.208	29.208				13240.00
13260.00	29.219	29.219				13260.00
13280.00	29.230	29.230				13280.00
13300.00	29.241	29.241				13300.00
13320.00	29.252	29.252				13320.00
13340.00	29.263	29.263				13340.00
13360.00	29.274	29.274				13360.00
13380.00	29.285	29.285				13380.00
13400.00	29.296	29.296				13400.00
13420.00	29.307	29.307				13420.00
13440.00	29.318	29.318				13440.00
13460.00	29.329	29.329				13460.00
13480.00	29.340	29.340				13480.00
13500.00	29.351	29.351				13500.00
13520.00	29.362	29.362				13520.00
13540.00	29.373	29.373				13540.00
13560.00	29.384	29.384				13560.00
13580.00	29.395	29.395				13580.00
13600.00	29.406	29.406				13600.00
13620.00	29.417	29.417				13620.00
13640.00	29.428	29.428				13640.00
13660.00	29.439	29.439				13660.00
13680.00	29.450	29.450				13680.00
13700.00	29.461	29.461				13700.00
13720.00	29.472	29.472				13720.00
13740.00	29.483	29.483				13740.00
13760.00	29.494	29.494				13760.00
13780.00	29.505	29.505				13780.00
13800.00	29.516	29.516				13800.00
13820.00	29.527	29.527				13820.00
13840.00	29.538	29.538				13840.00
13860.00	29.549	29.549				13860.00
13880.00	29.560	29.560				13880.00
13900.00	29.571	29.571				13900.00
13920.00	29.582	29.582				13920.00
13940.00	29.593	29.593				13940.00
13960.00	29.604	29.604				13960.00
13980.00	29.615	29.615				13980.00
14000.00	29.626	29.626				14000.00
14020.00	29.637	29.637				14020.00
14040.00	29.648	29.648				14040.00
14060.00	29.659	29.659				14060.00
14080.00	29.670	29.670				14080.00
14100.00	29.681	29.681				14100.00
14120.00	29.692	29.692				14120.00
14140.00	29.703	29.703				14140.00
14160.00	29.714	29.714				14160.00
14180.00	29.725	29.725				14180.00
14200.00	29.736	29.736				14200.00
14220.00	29.747	29.747				14220.00
14240.00	29.758	29.758				14240.00
14260.00	29.769	29.769				14260.00
14280.00	29.780	29.780				14280.00
14300.00	29.791	29.791				14300.00
14320.00	29.802	29.802				14320.00
14340.00	29.813	29.813				14340.00
14360.00	29.824	29.824				14360.00
14380.00	29.835	29.835				14380.00
14400.00	29.846	29.846				14400.00
14420.00	29.857	29.857				14420.00
14440.00	29.868	29.868				14440.00
14460.00	29.879	29.879				14460.00
14480.00	29.890	29.890				14480.00
14500.00	29.901	29.901				14500.00
14520.00	29.912	29.912				14520.00
14540.00	29.923	29.923				14540.00
14560.00	29.934	29.934				14560.00
14580.00	29.945	29.945				14580.00
14600.00	29.956	29.956				14600.00
14620.00	29.967	29.967				





CH= 14300.0/ Proposed B  
PROP FRL= 28.697

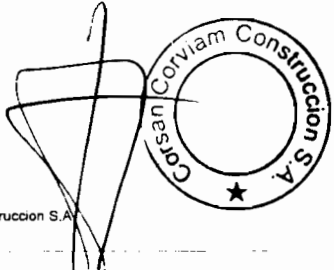
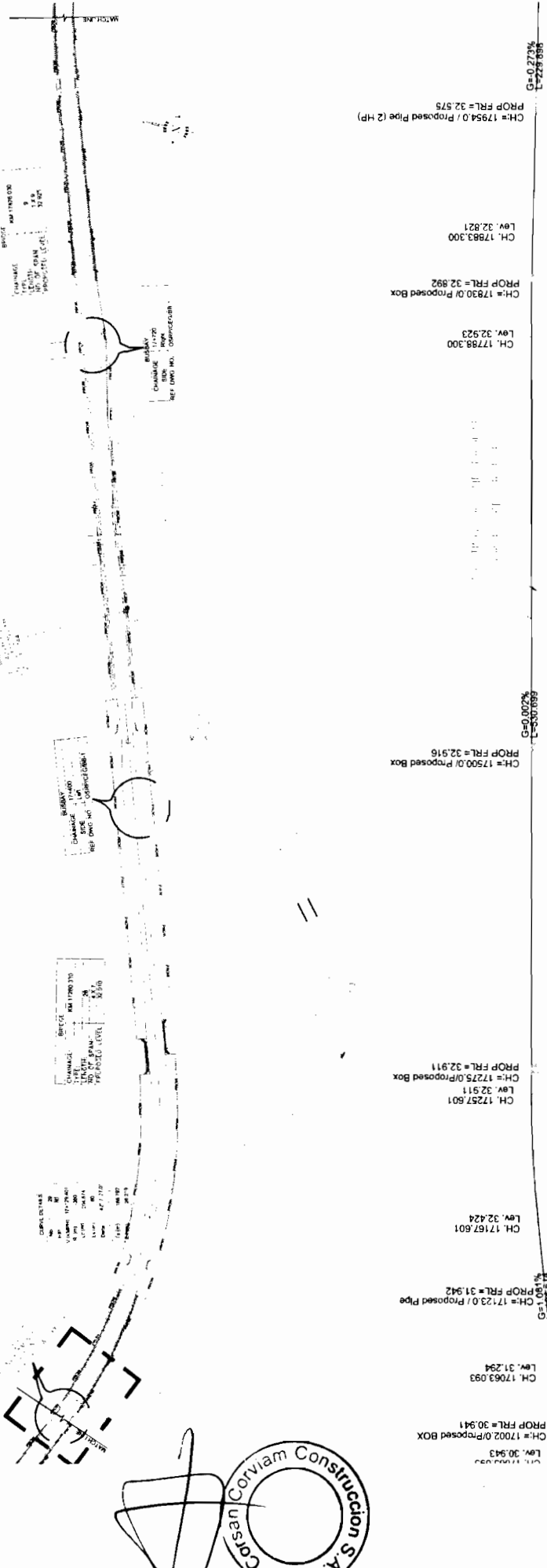
CH= 14166.0/ Proposed B  
PROP FRL= 28.435

CH	PROF	REF	DATE	SCALE
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14166.0	28.435	14166.0	18.03.13	1:200

STATION	DESIGN LEVEL	EXIST. LEVEL	HORIZONTAL ALIGNMENT	VERTICAL ALIGNMENT
14200.00	29.241	29.274		
14200.00	29.274	29.307		
14200.00	29.307	29.340		
14200.00	29.340	29.373		
14200.00	29.373	29.406		
14200.00	29.406	29.439		
14200.00	29.439	29.472		
14200.00	29.472	29.505		
14200.00	29.505	29.538		
14200.00	29.538	29.571		
14200.00	29.571	29.604		
14200.00	29.604	29.637		
14200.00	29.637	29.670		
14200.00	29.670	29.703		
14200.00	29.703	29.736		
14200.00	29.736	29.769		
14200.00	29.769	29.802		
14200.00	29.802	29.835		
14200.00	29.835	29.868		
14200.00	29.868	29.901		
14200.00	29.901	29.934		
14200.00	29.934	29.967		
14200.00	29.967	30.000		
14200.00	30.000	30.033		
14200.00	30.033	30.066		
14200.00	30.066	30.099		
14200.00	30.099	30.132		
14200.00	30.132	30.165		
14200.00	30.165	30.198		
14200.00	30.198	30.231		
14200.00	30.231	30.264		
14200.00	30.264	30.297		
14200.00	30.297	30.330		
14200.00	30.330	30.363		
14200.00	30.363	30.396		
14200.00	30.396	30.429		
14200.00	30.429	30.462		
14200.00	30.462	30.495		
14200.00	30.495	30.528		
14200.00	30.528	30.561		
14200.00	30.561	30.594		
14200.00	30.594	30.627		
14200.00	30.627	30.660		
14200.00	30.660	30.693		
14200.00	30.693	30.726		
14200.00	30.726	30.759		
14200.00	30.759	30.792		
14200.00	30.792	30.825		
14200.00	30.825	30.858		
14200.00	30.858	30.891		
14200.00	30.891	30.924		
14200.00	30.924	30.957		
14200.00	30.957	30.990		
14200.00	30.990	31.023		
14200.00	31.023	31.056		
14200.00	31.056	31.089		
14200.00	31.089	31.122		
14200.00	31.122	31.155		
14200.00	31.155	31.188		
14200.00	31.188	31.221		
14200.00	31.221	31.254		
14200.00	31.254	31.287		
14200.00	31.287	31.320		
14200.00	31.320	31.353		
14200.00	31.353	31.386		
14200.00	31.386	31.419		
14200.00	31.419	31.452		
14200.00	31.452	31.485		
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14200.00	31.749	31.782		
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14200.00	31.848	31.881		
14200.00	31.881	31.914		
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14200.00	31.980	32.013		
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14200.00	32.046	32.079		
14200.00	32.079	32.112		
14200.00	32.112	32.145		
14200.00	32.145	32.178		
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14200.00	32.277	32.310		
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14200.00	32.343	32.376		
14200.00	32.376	32.409		
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14200.00	32.475	32.508		
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14200.00	32.640	32.673		
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14200.00	32.904	32.937		
14200.00	32.937	32.970		
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14200.00	33.498	33.531		
14200.00	33.531	33.564		
14200.00	33.564	33.597		
14200.00	33.597	33.630		
14200.00	33.630	33.663		
14200.00	33.663	33.696		
14200.00	33.696	33.729		
14200.00	33.729	33.762		
14200.00	33.762	33.795		
14200.00	33.795	33.828		
14200.00	33.828	33.861		
14200.00	33.861	33.894		
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14200.00	33.993	34.026		
14200.00	34.026	34.059		
14200.00	34.059	34.092		
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14200.00	34.785	34.818		
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14200.00	34.884	34.917		
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14200.00	35.346	35.379		
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14200.00	35.445	35.478		
14200.00	35.478	35.511		
14200.00	35.511	35.544		
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14200.00	35.709	35.742		
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14200.00	35.808	35.841		
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14200.00	35.874	35.907		
14200.00	35.907	35.940		
14200.00	35.940	35.973		
14200.00	35.973	36.006		
14200.00	36.006	36.039		
14200.00	36.039	36.072		
14200.00	36.072	36.105		
14200.00	36.105	36.138		
14200.00	36.138	36.171		
14200.00	36.171	36.204		
14200.00	36.204	36.237		
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14200.00	36.270	36.303		
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14200.00	36.369	36.402		
14200.00	36.402	36.435		
14200.00	36.435	36.468		
14200.00	36.468	36.501		
14200.00	36.501	36.534		
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14200.00	36.600	36.633		
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14200.00	36.732	36.765		
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14200.00	36.864	36.897		
14200.00	36.897	36.930		
14200.00	36.930	36.963		
14200.00	36.963	36.996		
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14200.00	37.029	37.062		
14200.00	37.062	37.095		
14200.00	37.095	37.128		
14200.00	37.128	37.161		
14200.00	37.161	37.194		
14200.00	37.194	37.227		
14200.00	37.227			







DATUM = 20.00  
PROPOSED ROAD  
LEVEL (m)

HORIZONTAL  
ALIGNMENT

CHIEF SUPERELEVATION  
CROSSFALL  
DRAINAGE

Stationing	Proposed Road Level (m)	Horizontal Alignment (m)	Vertical Curve Data
17+000	30.982	31.089	
17+020	30.982	31.089	
17+040	31.089	31.477	
17+060	31.262	31.693	
17+080	31.477	31.909	
17+100	31.693	32.125	
17+120	31.909	32.342	
17+140	32.125	32.559	
17+160	32.342	32.771	
17+180	32.559	32.988	
17+200	32.771	33.200	
17+220	32.988	33.412	
17+240	33.200	33.624	
17+260	33.412	33.836	
17+280	33.624	34.048	
17+300	33.836	34.260	
17+320	34.048	34.472	
17+340	34.260	34.684	
17+360	34.472	34.896	
17+380	34.684	35.108	
17+400	34.896	35.320	
17+420	35.108	35.532	
17+440	35.320	35.744	
17+460	35.532	35.956	
17+480	35.744	36.168	
17+500	35.956	36.380	
17+520	36.168	36.592	
17+540	36.380	36.804	
17+560	36.592	37.016	
17+580	36.804	37.228	
17+600	37.016	37.440	
17+620	37.228	37.652	
17+640	37.440	37.864	
17+660	37.652	38.076	
17+680	37.864	38.288	
17+700	38.076	38.500	
17+720	38.288	38.712	
17+740	38.500	38.924	
17+760	38.712	39.136	
17+780	38.924	39.348	
17+800	39.136	39.560	
17+820	39.348	39.772	
17+840	39.560	39.984	
17+860	39.772	40.196	
17+880	39.984	40.408	
17+900	40.196	40.620	
17+920	40.408	40.832	
17+940	40.620	41.044	
17+960	40.832	41.256	
17+980	41.044	41.468	
18+000	41.256	41.680	

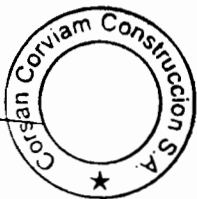
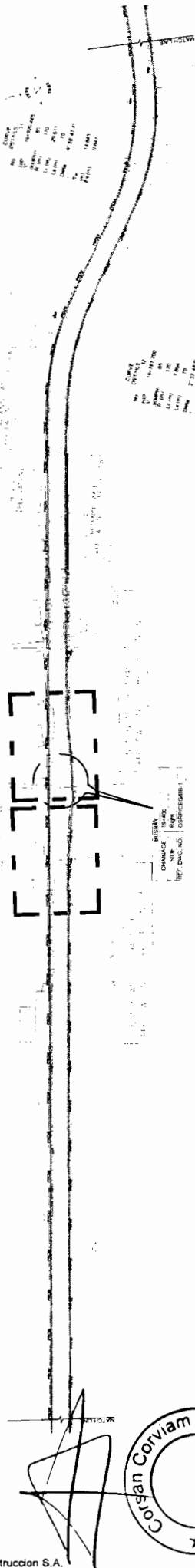
WIDENING AND STRENGTHENING TO TWO LANE  
BHADRAK TO ANANDPUR BALANCE WORK(SH-43) KM 17000 TO KM 18000

PROJECT:-  
**CONSULTING**  
ENGINEER, WBPROUP LTD.  
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

DATE: 18.01.13  
SCALE: HORIZONTAL: 1:2000  
VERTICAL: 1:200

Chief Engineer,  
WBPROUP LTD.





CH= 19695.0/Proposed Pipe  
PROP FRL= 33.568

CH. 19732.676  
LEV. 33.609  
G=0.655%  
L=330.000

CH. 19792.676  
LEV. 33.450  
G=0.655%  
L=330.000

CH. 19823.474  
LEV. 33.255  
G=1.038%  
L=330.000

CH. 19883.474  
LEV. 33.375  
G=1.038%  
L=330.000

CH. 19927.522  
LEV. 33.832  
G=1.038%  
L=330.000

CH. 19997.522  
LEV. 34.102  
G=1.038%  
L=330.000

DATUM = 20.00

PROPOSED ROAD  
LEVEL (m)

32.819	32.819
32.840	32.840
32.861	32.861
32.883	32.883
32.905	32.905
32.926	32.926
32.948	32.948
32.969	32.969
32.991	32.991
33.012	33.012
33.034	33.034
33.056	33.056
33.077	33.077
33.099	33.099
33.120	33.120
33.142	33.142
33.163	33.163
33.185	33.185
33.207	33.207
33.228	33.228
33.250	33.250
33.271	33.271
33.293	33.293
33.315	33.315
33.336	33.336
33.358	33.358
33.379	33.379
33.401	33.401
33.422	33.422
33.444	33.444
33.466	33.466
33.487	33.487
33.509	33.509
33.530	33.530
33.552	33.552
33.573	33.573
33.595	33.595
33.613	33.613
33.632	33.632
33.652	33.652
33.673	33.673
33.695	33.695
33.713	33.713
33.732	33.732
33.751	33.751
33.769	33.769
33.787	33.787
33.804	33.804
33.821	33.821
33.837	33.837
33.854	33.854
33.871	33.871
33.887	33.887
33.904	33.904
33.920	33.920
33.936	33.936
33.952	33.952
33.968	33.968
33.984	33.984
34.000	34.000
34.016	34.016
34.032	34.032
34.048	34.048
34.064	34.064
34.080	34.080
34.096	34.096
34.112	34.112
34.128	34.128
34.144	34.144
34.160	34.160
34.176	34.176
34.192	34.192
34.208	34.208
34.224	34.224
34.240	34.240
34.256	34.256
34.272	34.272
34.288	34.288
34.304	34.304
34.320	34.320
34.336	34.336
34.352	34.352
34.368	34.368
34.384	34.384
34.400	34.400
34.416	34.416
34.432	34.432
34.448	34.448
34.464	34.464
34.480	34.480
34.496	34.496
34.512	34.512
34.528	34.528
34.544	34.544
34.560	34.560
34.576	34.576
34.592	34.592
34.608	34.608
34.624	34.624
34.640	34.640
34.656	34.656
34.672	34.672
34.688	34.688
34.704	34.704
34.720	34.720
34.736	34.736
34.752	34.752
34.768	34.768
34.784	34.784
34.800	34.800
34.816	34.816
34.832	34.832
34.848	34.848
34.864	34.864
34.880	34.880
34.896	34.896
34.912	34.912
34.928	34.928
34.944	34.944
34.960	34.960
34.976	34.976
34.992	34.992
35.008	35.008
35.024	35.024
35.040	35.040
35.056	35.056
35.072	35.072
35.088	35.088
35.104	35.104
35.120	35.120
35.136	35.136
35.152	35.152
35.168	35.168
35.184	35.184
35.200	35.200
35.216	35.216
35.232	35.232
35.248	35.248
35.264	35.264
35.280	35.280
35.296	35.296
35.312	35.312
35.328	35.328
35.344	35.344
35.360	35.360
35.376	35.376
35.392	35.392
35.408	35.408
35.424	35.424
35.440	35.440
35.456	35.456
35.472	35.472
35.488	35.488
35.504	35.504
35.520	35.520
35.536	35.536
35.552	35.552
35.568	35.568
35.584	35.584
35.600	35.600
35.616	35.616
35.632	35.632
35.648	35.648
35.664	35.664
35.680	35.680
35.696	35.696
35.712	35.712
35.728	35.728
35.744	35.744
35.760	35.760
35.776	35.776
35.792	35.792
35.808	35.808
35.824	35.824
35.840	35.840
35.856	35.856
35.872	35.872
35.888	35.888
35.904	35.904
35.920	35.920
35.936	35.936
35.952	35.952
35.968	35.968
35.984	35.984
36.000	36.000

HORIZONTAL  
ALIGNMENT

VERTICAL  
ALIGNMENT

CROSSFALL

CHAINAGE

19+000	19+000
19+020	19+020
19+040	19+040
19+060	19+060
19+080	19+080
19+100	19+100
19+120	19+120
19+140	19+140
19+160	19+160
19+180	19+180
19+200	19+200
19+220	19+220
19+240	19+240
19+260	19+260
19+280	19+280
19+300	19+300
19+320	19+320
19+340	19+340
19+360	19+360
19+380	19+380
19+400	19+400
19+420	19+420
19+440	19+440
19+460	19+460
19+480	19+480
19+500	19+500
19+520	19+520
19+540	19+540
19+560	19+560
19+580	19+580
19+600	19+600
19+620	19+620
19+640	19+640
19+660	19+660
19+680	19+680
19+700	19+700
19+720	19+720
19+740	19+740
19+760	19+760
19+780	19+780
19+800	19+800
19+820	19+820
19+840	19+840
19+860	19+860
19+880	19+880
19+900	19+900
19+920	19+920
19+940	19+940
19+960	19+960
19+980	19+980
20+000	20+000
20+020	20+020

**CONSULTING PROJECT-**  
**ENGINEER, WBPROUP LTD.**

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

WIDENING AND STRENGTHENING TO TWO LANE


SHAKRAK TO ANANDPUR BALANCE WORK(SH-53) KM 19.000 TO KM 20.000  
DATE: 18.01.13 REV: 01  
SCALE: VERTICAL: 1:1,200  
SHEET NO: 18.01.13-008  
REV: 01  
DATE: 18.01.13  
SCALE: HORIZONTAL: 1:1,200

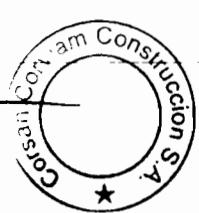
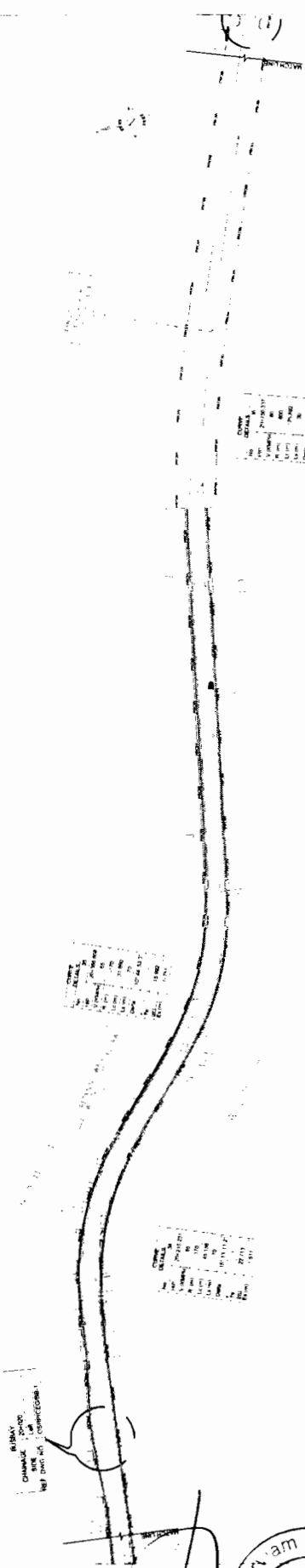


REVISIONS:  
NO. DATE BY  
1 18.01.13 J.S.  
2 18.01.13 J.S.  
3 18.01.13 J.S.  
4 18.01.13 J.S.  
5 18.01.13 J.S.  
6 18.01.13 J.S.  
7 18.01.13 J.S.  
8 18.01.13 J.S.  
9 18.01.13 J.S.  
10 18.01.13 J.S.

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

DATUM = 20.00

Checked by:   
World Bank Project Officer  
O/o the E.I.C.(Civil), Odisha  
Bhubaneswar



12.00
10.00
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12.00
01.00
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22.00

**WIDENING AND STRENGTHENING TO TWO LANE**

DRG NO. 21 | DATE 18.01.13 | R/V | R1 | CEG | CEG | FF-PMU | CE-WBP

HORIZONTAL: 1:2000  
VERTICAL: 1:200

**CONSULTING ENGINEER, WBPROUP LTD.**

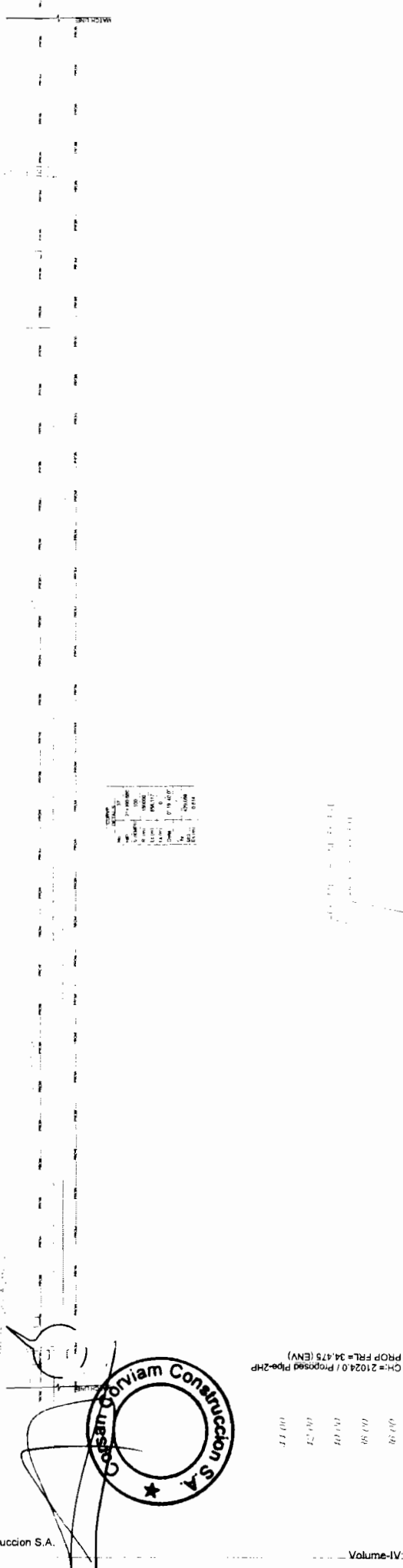
**CEG**

PROJECT:-  
PREPARATION OF PHASE - (I) ROADS FOR ORISSA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

12.00
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26.00
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22.00

AMANGOL

BHADRAK



DATE	10/10/2013
SCALE	1:1000
PROJECT	ODISHA STATE ROAD PROJECT
CLIENT	WBPRUP LTD.
DESIGNER	CEG
CHECKED BY	[Signature]
APPROVED BY	[Signature]

CH=21024.0 / Proposed Pile-2HP  
PROP FRL=34.475 (ENV)

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DATUM = 22.00

21900.00	34.155	
21920.00	34.472	
21940.00	34.489	
21960.00	34.506	
21980.00	34.523	
21100.00	34.540	
21120.00	34.557	
21140.00	34.574	
21160.00	34.591	
21180.00	34.608	
21200.00	34.625	
21220.00	34.642	
21240.00	34.659	
21260.00	34.676	
21280.00	34.693	
21300.00	34.710	
21320.00	34.727	
21340.00	34.744	
21360.00	34.761	
21380.00	34.778	
21400.00	34.795	
21420.00	34.812	
21440.00	34.829	
21460.00	34.846	
21480.00	34.863	
21500.00	34.880	
21520.00	34.897	
21540.00	34.914	
21560.00	34.931	
21580.00	34.948	
21600.00	34.965	
21620.00	34.982	
21640.00	34.999	
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21760.00	35.101	
21780.00	35.118	
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21820.00	35.152	
21840.00	35.169	
21860.00	35.186	
21880.00	35.203	
21900.00	35.220	
21920.00	35.237	
21940.00	35.254	
21960.00	35.271	
21980.00	35.288	
22000.00	35.305	

Project: 117

**LEGEND**

- EXISTING CENTERLINE
- EXISTING RIGHT OF WAY
- EXISTING ROADWAY
- PROPOSED CENTERLINE
- PROPOSED RIGHT OF WAY
- PROPOSED ROADWAY
- PROPOSED DRIVE
- PROPOSED SIDEWALK
- PROPOSED BIKEWAY
- PROPOSED CANAL
- PROPOSED DRAINAGE
- PROPOSED FENCE
- PROPOSED SIGN
- PROPOSED LIGHT
- PROPOSED UTILITY
- PROPOSED WATER
- PROPOSED SEWER
- PROPOSED GAS
- PROPOSED TELEPHONE
- PROPOSED CABLE
- PROPOSED POWER
- PROPOSED FUEL
- PROPOSED OIL
- PROPOSED WATER
- PROPOSED SEWER
- PROPOSED GAS
- PROPOSED TELEPHONE
- PROPOSED CABLE
- PROPOSED POWER
- PROPOSED FUEL
- PROPOSED OIL

**PROJECT:-**

**ODISHA STATE ROAD PROJECT**

**UNDER WORLD BANK ASSISTANCE**

**CEG**

**CONSULTING ENGINEER, WBPRUP LTD.**

**WIDENING AND STRENGTHENING TO TWO LANE**

BHADRAK TO ANANDPUR BALANCE WORK (SH-23) KM 21.000 TO 22.000

DATE: 16.01.13 REV: 01

SCALE: HORIZONTAL: 1:200 VERTICAL: 1:100

DESIGNER: CEG

CHECKED BY: CEG

APPROVED BY: CEG

DATE: 16.01.13

REV: 01

SCALE: HORIZONTAL: 1:200 VERTICAL: 1:100

DESIGNER: CEG

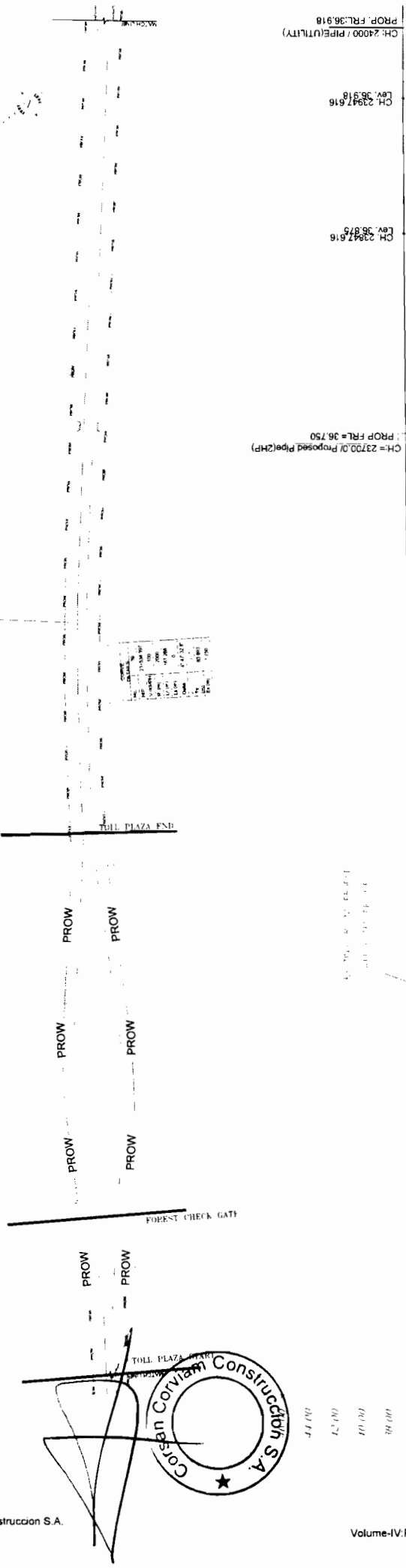
CHECKED BY: CEG

APPROVED BY: CEG





Corsan Corviam Construccion S.A.  
Contractor



CH=2370.0 Proposed Pipe (2HP)  
PROP FRL=36.750

CH=2367.616 Proposed Pipe (2HP)  
PROP FRL=36.875

CH=2367.616 Proposed Pipe (2HP)  
PROP FRL=36.918

CH=2367.616 Proposed Pipe (2HP)  
PROP FRL=36.918

DATUM = 24.00

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23940.00	36.189
23880.00	36.206
23820.00	36.223
23760.00	36.240
23700.00	36.257
23640.00	36.274
23580.00	36.291
23520.00	36.308
23460.00	36.325
23400.00	36.342
23340.00	36.359
23280.00	36.376
23220.00	36.393
23160.00	36.410
23100.00	36.427
23040.00	36.444
22980.00	36.461
22920.00	36.478
22860.00	36.495
22800.00	36.512
22740.00	36.529
22680.00	36.546
22620.00	36.563
22560.00	36.580
22500.00	36.597
22440.00	36.614
22380.00	36.631
22320.00	36.648
22260.00	36.665
22200.00	36.682
22140.00	36.699
22080.00	36.716
22020.00	36.733
21960.00	36.750
21900.00	36.767
21840.00	36.784
21780.00	36.801
21720.00	36.818
21660.00	36.835
21600.00	36.852
21540.00	36.869
21480.00	36.886
21420.00	36.903
21360.00	36.920
21300.00	36.937
21240.00	36.954
21180.00	36.971
21120.00	36.988
21060.00	37.005
21000.00	37.022
20940.00	37.039
20880.00	37.056
20820.00	37.073
20760.00	37.090
20700.00	37.107
20640.00	37.124
20580.00	37.141
20520.00	37.158
20460.00	37.175
20400.00	37.192
20340.00	37.209
20280.00	37.226
20220.00	37.243
20160.00	37.260
20100.00	37.277
20040.00	37.294
19980.00	37.311
19920.00	37.328
19860.00	37.345
19800.00	37.362
19740.00	37.379
19680.00	37.396
19620.00	37.413
19560.00	37.430
19500.00	37.447
19440.00	37.464
19380.00	37.481
19320.00	37.498
19260.00	37.515
19200.00	37.532
19140.00	37.549
19080.00	37.566
19020.00	37.583
18960.00	37.600
18900.00	37.617
18840.00	37.634
18780.00	37.651
18720.00	37.668
18660.00	37.685
18600.00	37.702
18540.00	37.719
18480.00	37.736
18420.00	37.753
18360.00	37.770
18300.00	37.787
18240.00	37.804
18180.00	37.821
18120.00	37.838
18060.00	37.855
18000.00	37.872
17940.00	37.889
17880.00	37.906
17820.00	37.923
17760.00	37.940
17700.00	37.957
17640.00	37.974
17580.00	37.991
17520.00	38.008
17460.00	38.025
17400.00	38.042
17340.00	38.059
17280.00	38.076
17220.00	38.093
17160.00	38.110
17100.00	38.127
17040.00	38.144
16980.00	38.161
16920.00	38.178
16860.00	38.195
16800.00	38.212
16740.00	38.229
16680.00	38.246
16620.00	38.263
16560.00	38.280
16500.00	38.297
16440.00	38.314
16380.00	38.331
16320.00	38.348
16260.00	38.365
16200.00	38.382
16140.00	38.399
16080.00	38.416
16020.00	38.433
15960.00	38.450
15900.00	38.467
15840.00	38.484
15780.00	38.501
15720.00	38.518
15660.00	38.535
15600.00	38.552
15540.00	38.569
15480.00	38.586
15420.00	38.603
15360.00	38.620
15300.00	38.637
15240.00	38.654
15180.00	38.671
15120.00	38.688
15060.00	38.705
15000.00	38.722
14940.00	38.739
14880.00	38.756
14820.00	38.773
14760.00	38.790
14700.00	38.807
14640.00	38.824
14580.00	38.841
14520.00	38.858
14460.00	38.875
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14340.00	38.909
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14220.00	38.943
14160.00	38.960
14100.00	38.977
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13980.00	39.011
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13860.00	39.045
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13740.00	39.079
13680.00	39.096
13620.00	39.113
13560.00	39.130
13500.00	39.147
13440.00	39.164
13380.00	39.181
13320.00	39.198
13260.00	39.215
13200.00	39.232
13140.00	39.249
13080.00	39.266
13020.00	39.283
12960.00	39.300
12900.00	39.317
12840.00	39.334
12780.00	39.351
12720.00	39.368
12660.00	39.385
12600.00	39.402
12540.00	39.419
12480.00	39.436
12420.00	39.453
12360.00	39.470
12300.00	39.487
12240.00	39.504
12180.00	39.521
12120.00	39.538
12060.00	39.555
12000.00	39.572
11940.00	39.589
11880.00	39.606
11820.00	39.623
11760.00	39.640
11700.00	39.657
11640.00	39.674
11580.00	39.691
11520.00	39.708
11460.00	39.725
11400.00	39.742
11340.00	39.759
11280.00	39.776
11220.00	39.793
11160.00	39.810
11100.00	39.827
11040.00	39.844
10980.00	39.861
10920.00	39.878
10860.00	39.895
10800.00	39.912
10740.00	39.929
10680.00	39.946
10620.00	39.963
10560.00	39.980
10500.00	39.997
10440.00	40.014
10380.00	40.031
10320.00	40.048
10260.00	40.065
10200.00	40.082
10140.00	40.099
10080.00	40.116
10020.00	40.133
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9780.00	40.201
9720.00	40.218
9660.00	40.235
9600.00	40.252
9540.00	40.269
9480.00	40.286
9420.00	40.303
9360.00	40.320
9300.00	40.337
9240.00	40.354
9180.00	40.371
9120.00	40.388
9060.00	40.405
9000.00	40.422
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8880.00	40.456
8820.00	40.473
8760.00	40.490
8700.00	40.507
8640.00	40.524
8580.00	40.541
8520.00	40.558
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8400.00	40.592
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8280.00	40.626
8220.00	40.643
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8100.00	40.677
8040.00	40.694
7980.00	40.711
7920.00	40.728
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7800.00	40.762
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7680.00	40.796
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6360.00	41.169
6300.00	41.186
6240.00	41.203
6180.00	41.220
6120.00	41.237
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5580.00	41.390
5520.00	41.407
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5400.00	41.441
5340.00	41.458
5280.00	41.475
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5160.00	41.509
5100.00	41.526
5040.00	41.543
4980.00	41.560
4920.00	41.577
4860.00	41.594
4800.00	41.611
4740.00	41.628
4680.00	41.645
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4380.00	41.730
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3900.00	41.866
3840.00	41.883
3780.00	41.900
3720.00	41.917
3660.00	41.934
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2280.00	42.325
2220.00	42.342
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2100.00	42.376
2040.00	42.393
1980.00	42.410
1920.00	42.427
1860.00	42.444
1800.00	42.461
1740.00	42.478
1680.00	42.495
1620.00	42.512
1560.00	42.529
1500.00	42.546
1440.00	42.563
1380.00	42.580
1320.00	42.597
1260.00	42.614
1200.00	42.631
1140.00	42.648
1080.00	42.665
1020.00	42.682
960.00	42.699
900.00	42.716
840.00	42.733
780.00	42.750
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600.00	42.801
540.00	42.818
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120.00	42.937
60.00	42.954
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R=2500.000 L=167.285

Station 117

**CEG CONSULTING ENGINEERS/WBPROUP LTD.**  
 PROJECT:-  
**ODISHA STATE ROAD PROJECT**  
 UNDER WORLD BANK ASSISTANCE

**WIDENING AND STRENGTHENING TO TWO LANE**

BRADDAK TO ANANDPUR BALANCE WORK(SH-5) KM 23000 TO 24000

DRW NO. 10/2023/001  
 SH NO. 10/2023/001  
 DATE: 08.01.19  
 REV: R1  
 SCALE: HORIZONTAL: 1:1000  
 VERTICAL: 1:200

CEWB  
 EE(PM)  
 GEG  
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 GEG

**LEGEND**

- PROPOSED CENTER LINE
- EXIST



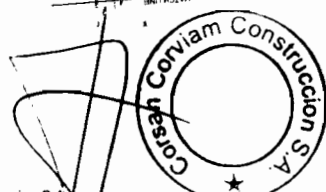
Corsan Corviam Construction S.A  
Contractor

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

NO.	DESCRIPTION	AMOUNT
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REVISIONS

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STATION	DESCRIPTION	AMOUNT
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STATION	DESCRIPTION	AMOUNT
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WIDENING AND STRENGTHENING TO TWO LANE

SHADRAK TO ANANIPUR BALANCE WORKS (S) KM 25.00 TO 26.00

DRG NO. 25  
SH NO. 25  
DATE: 18.01.13  
HORIZONTAL: 1:200  
VERTICAL: 1:200

CEG  
REV  
RT  
CEG  
CEG  
EF PMU  
CE WBP

PROJECT:-  
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

CONSULTING  
ENGINEER/WBPROUP LTD.  
CEG

LEGEND

EXISTING CONTROL LINE  
EXISTING CENTER LINE  
EXISTING CANAL WAY  
PRO. CANAL WAY DICES

EXISTING NEW BOUNDARY  
PRO. NEW BOUNDARY  
PRO. NEW CANAL WAY/STRUCTURE  
PRO. NEW CANAL WAY/STRUCTURE  
PRO. NEW CANAL WAY/STRUCTURE

LINE BOUNDARY  
BOUNDARY OF SPINAL CURVE  
BOUNDARY OF CIRCULAR CURVE  
APEX OF CURVE  
END OF CIRCULAR CURVE  
END OF SPINAL CURVE  
HORIZONTAL INTERSECTION POINT  
DIVISION ANGLE

LENGTH OF SPINAL CURVE  
TANGENT LENGTH  
LENGTH OF CIRCULAR CURVE  
APEX DISTANCE  
SUPERELEVATION  
DESIGN SPEED  
RADIUS OF CURVE

DATUM = 26.00

SL=60.01

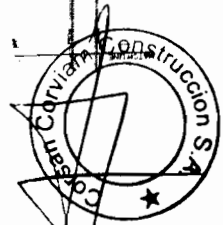
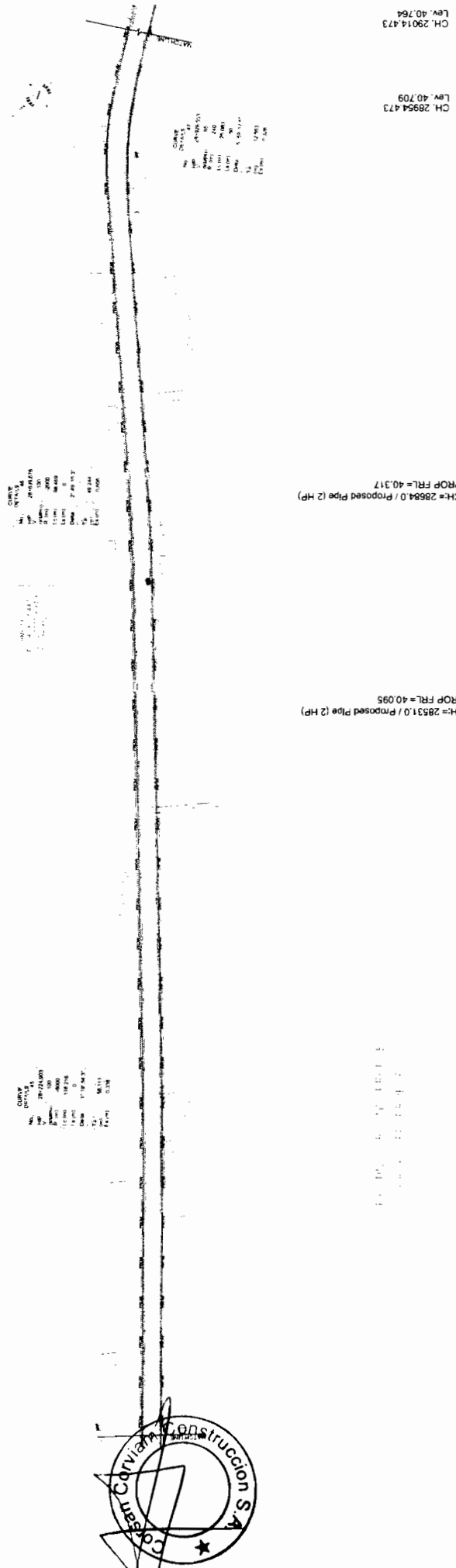
R=1020.000 L=146.885

L=135.000

R=1020.000 L=146.885







STATIONING	PROPOSED ROAD LEVEL (m)	PROPOSED ROAD LEVEL (m)	PROPOSED ROAD LEVEL (m)
28+000	39.025	39.025	39.025
28+010	39.025	39.025	39.025
28+020	39.025	39.025	39.025
28+030	39.025	39.025	39.025
28+040	39.025	39.025	39.025
28+050	39.025	39.025	39.025
28+060	39.025	39.025	39.025
28+070	39.025	39.025	39.025
28+080	39.025	39.025	39.025
28+090	39.025	39.025	39.025
28+100	39.025	39.025	39.025
28+110	39.025	39.025	39.025
28+120	39.025	39.025	39.025
28+130	39.025	39.025	39.025
28+140	39.025	39.025	39.025
28+150	39.025	39.025	39.025
28+160	39.025	39.025	39.025
28+170	39.025	39.025	39.025
28+180	39.025	39.025	39.025
28+190	39.025	39.025	39.025
28+200	39.025	39.025	39.025
28+210	39.025	39.025	39.025
28+220	39.025	39.025	39.025
28+230	39.025	39.025	39.025
28+240	39.025	39.025	39.025
28+250	39.025	39.025	39.025
28+260	39.025	39.025	39.025
28+270	39.025	39.025	39.025
28+280	39.025	39.025	39.025
28+290	39.025	39.025	39.025
28+300	39.025	39.025	39.025
28+310	39.025	39.025	39.025
28+320	39.025	39.025	39.025
28+330	39.025	39.025	39.025
28+340	39.025	39.025	39.025
28+350	39.025	39.025	39.025
28+360	39.025	39.025	39.025
28+370	39.025	39.025	39.025
28+380	39.025	39.025	39.025
28+390	39.025	39.025	39.025
28+400	39.025	39.025	39.025
28+410	39.025	39.025	39.025
28+420	39.025	39.025	39.025
28+430	39.025	39.025	39.025
28+440	39.025	39.025	39.025
28+450	39.025	39.025	39.025
28+460	39.025	39.025	39.025
28+470	39.025	39.025	39.025
28+480	39.025	39.025	39.025
28+490	39.025	39.025	39.025
28+500	39.025	39.025	39.025
28+510	39.025	39.025	39.025
28+520	39.025	39.025	39.025
28+530	39.025	39.025	39.025
28+540	39.025	39.025	39.025
28+550	39.025	39.025	39.025
28+560	39.025	39.025	39.025
28+570	39.025	39.025	39.025
28+580	39.025	39.025	39.025
28+590	39.025	39.025	39.025
28+600	39.025	39.025	39.025
28+610	39.025	39.025	39.025
28+620	39.025	39.025	39.025
28+630	39.025	39.025	39.025
28+640	39.025	39.025	39.025
28+650	39.025	39.025	39.025
28+660	39.025	39.025	39.025
28+670	39.025	39.025	39.025
28+680	39.025	39.025	39.025
28+690	39.025	39.025	39.025
28+700	39.025	39.025	39.025
28+710	39.025	39.025	39.025
28+720	39.025	39.025	39.025
28+730	39.025	39.025	39.025
28+740	39.025	39.025	39.025
28+750	39.025	39.025	39.025
28+760	39.025	39.025	39.025
28+770	39.025	39.025	39.025
28+780	39.025	39.025	39.025
28+790	39.025	39.025	39.025
28+800	39.025	39.025	39.025
28+810	39.025	39.025	39.025
28+820	39.025	39.025	39.025
28+830	39.025	39.025	39.025
28+840	39.025	39.025	39.025
28+850	39.025	39.025	39.025
28+860	39.025	39.025	39.025
28+870	39.025	39.025	39.025
28+880	39.025	39.025	39.025
28+890	39.025	39.025	39.025
28+900	39.025	39.025	39.025
28+910	39.025	39.025	39.025
28+920	39.025	39.025	39.025
28+930	39.025	39.025	39.025
28+940	39.025	39.025	39.025
28+950	39.025	39.025	39.025
28+960	39.025	39.025	39.025
28+970	39.025	39.025	39.025
28+980	39.025	39.025	39.025
28+990	39.025	39.025	39.025
29+000	39.025	39.025	39.025

**WIDENING AND STRENGTHENING TO TWO LANE**

**CONSULTING PROJECT:-**  
**ENGINEER, WBPROUP LTD.**  
**ODISHA STATE ROAD PROJECT**  
**UNDER WORLD BANK ASSISTANCE**

**CEG**

SCALE: HORIZONTAL: 1:2000 VERTICAL: 1:200

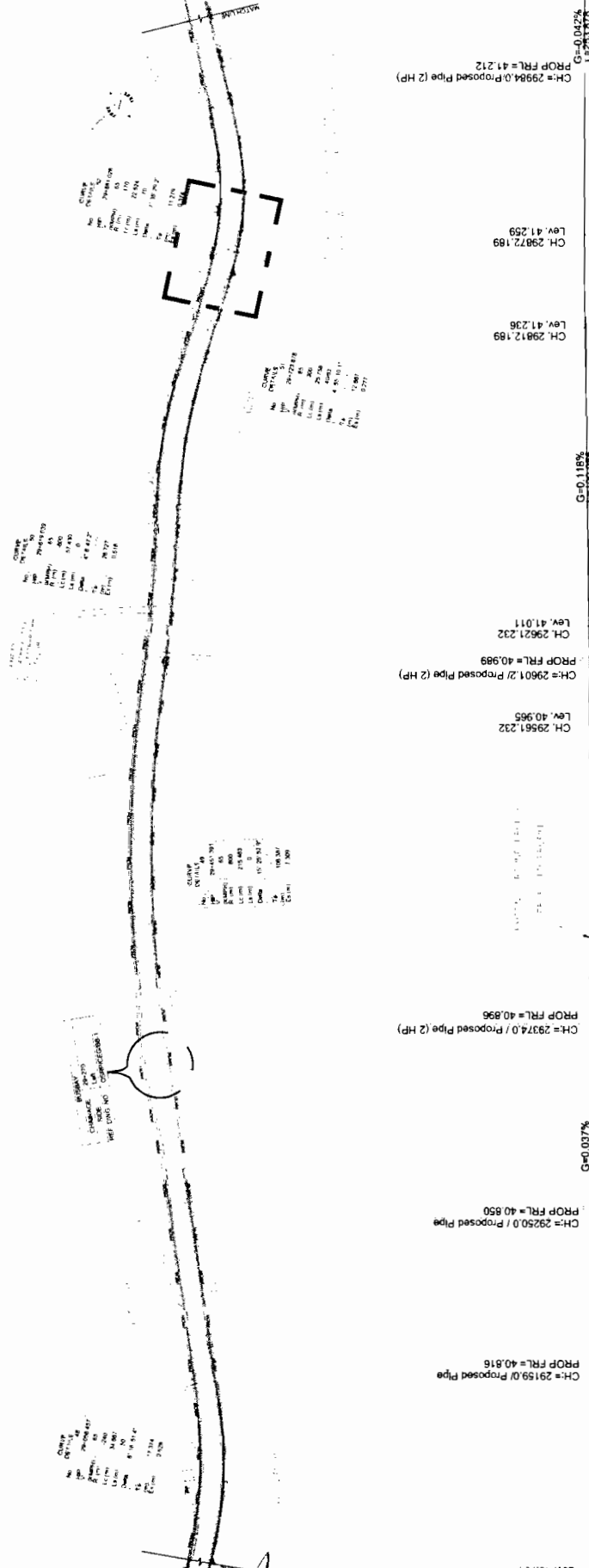
DATE: 18.01.13 REV: 01

DESIGNER: [Signature] CHECKER: [Signature] APPROVED: [Signature]

DRAWN: [Signature] PROJECT: [Signature] DATE: 18.01.13

SCALE: HORIZONTAL: 1:2000 VERTICAL: 1:200

CEG ENGINEER, WBPROUP LTD.



DATUM = 28.00  
PROPOSED ROAD LEVEL (m)

Stationing	Proposed Road Level (m)	Proposed Pipe (2 HP) Chainage	Proposed Pipe (2 HP) Level
29+000	40.755	CH=29014.473	40.755
29+020	40.755		40.755
29+040	40.755		40.755
29+060	40.755		40.755
29+080	40.755		40.755
29+100	40.755		40.755
29+120	40.755		40.755
29+140	40.755	CH=29159.0 / Proposed Pipe	40.816
29+160	40.755		40.755
29+180	40.755		40.755
29+200	40.755		40.755
29+220	40.755		40.755
29+240	40.755		40.755
29+260	40.755		40.755
29+280	40.755		40.755
29+300	40.755		40.755
29+320	40.755		40.755
29+340	40.755		40.755
29+360	40.755		40.755
29+380	40.755		40.755
29+400	40.755		40.755
29+420	40.755		40.755
29+440	40.755		40.755
29+460	40.755		40.755
29+480	40.755		40.755
29+500	40.755		40.755
29+520	40.755		40.755
29+540	40.755		40.755
29+560	40.755	CH=29561.232	40.965
29+580	40.755		40.755
29+600	40.755	CH=29601.2 / Proposed Pipe	40.989
29+620	40.755		40.755
29+640	40.755		40.755
29+660	40.755		40.755
29+680	40.755		40.755
29+700	40.755		40.755
29+720	40.755		40.755
29+740	40.755		40.755
29+760	40.755		40.755
29+780	40.755		40.755
29+800	40.755		40.755
29+820	40.755		40.755
29+840	40.755		40.755
29+860	40.755		40.755
29+880	40.755		40.755
29+900	40.755		40.755
29+920	40.755		40.755
29+940	40.755		40.755
29+960	40.755		40.755
29+980	40.755		40.755
30+000	40.755		40.755

**WIDENING AND STRENGTHENING TO TWO LANE**

PHADIRAK TO ANANDPUR BALANCE WORK(SH-3) KM 29+000 TO KM 30+000

PROJ. NO. 30 DATE: 18.01.13 REV. R1  
SCALE: HORIZONTAL: 1:2000 VERTICAL: 1:200

**CONSULTING PROJECT:-**  
**ENGINEERING, WB GROUP LTD.**  
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

**CEG**

REVISIONS

DATE: 18.01.13

REVISION NO. 1

REVISION DESCRIPTION

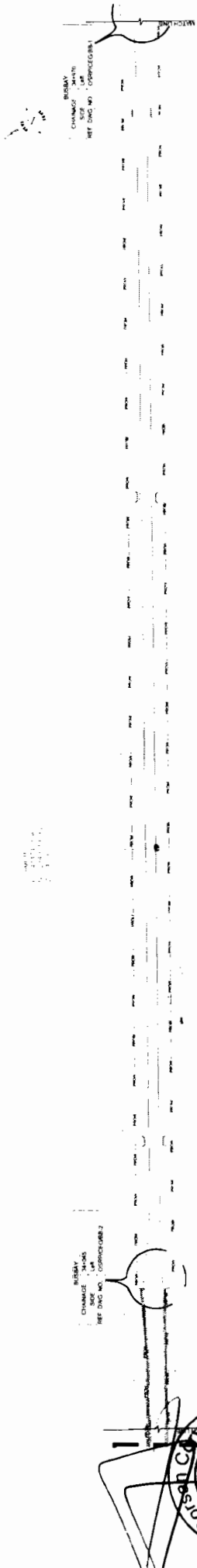






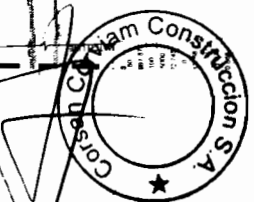






REVISIONS:  
 1. CHANGE SHEET NO. 1  
 2. DATE: 18/01/13  
 3. BY: [Signature]  
 4. CHECKED BY: [Signature]

REVISIONS:  
 1. CHANGE SHEET NO. 1  
 2. DATE: 18/01/13  
 3. BY: [Signature]  
 4. CHECKED BY: [Signature]



CH = 34204.0 / Proposed Pipe (2 HP)  
 Lwp: 44.715

CH = 34448.358 / Proposed Pipe (2 HP)  
 Lwp: 44.715

CH = 34662.0 / Proposed Pipe (2 HP)  
 Lwp: 44.715

CH = 34936.0 / Proposed Pipe  
 Lwp: 44.715

G = -0.088%

DATUM = 32.00  
 PROPOSED ROAD LEVEL (m)

34+000	44.394
34+010	44.394
34+020	44.394
34+030	44.394
34+040	44.394
34+050	44.394
34+060	44.394
34+070	44.394
34+080	44.394
34+090	44.394
34+100	44.407
34+110	44.424
34+120	44.442
34+130	44.460
34+140	44.478
34+150	44.495
34+160	44.513
34+170	44.531
34+180	44.548
34+190	44.566
34+200	44.584
34+210	44.602
34+220	44.619
34+230	44.637
34+240	44.655
34+250	44.673
34+260	44.690
34+270	44.708
34+280	44.725
34+290	44.743
34+300	44.761
34+310	44.778
34+320	44.796
34+330	44.814
34+340	44.832
34+350	44.850
34+360	44.868
34+370	44.886
34+380	44.904
34+390	44.922
34+400	44.940
34+410	44.958
34+420	44.976
34+430	44.994
34+440	45.012
34+450	45.030
34+460	45.048
34+470	45.066
34+480	45.084
34+490	45.102
34+500	45.120
34+510	45.138
34+520	45.156
34+530	45.174
34+540	45.192
34+550	45.210
34+560	45.228
34+570	45.246
34+580	45.264
34+590	45.282
34+600	45.300
34+610	45.318
34+620	45.336
34+630	45.354
34+640	45.372
34+650	45.390
34+660	45.408
34+670	45.426
34+680	45.444
34+690	45.462
34+700	45.480
34+710	45.498
34+720	45.516
34+730	45.534
34+740	45.552
34+750	45.570
34+760	45.588
34+770	45.606
34+780	45.624
34+790	45.642
34+800	45.660
34+810	45.678
34+820	45.696
34+830	45.714
34+840	45.732
34+850	45.750
34+860	45.768
34+870	45.786
34+880	45.804
34+890	45.822
34+900	45.840
34+910	45.858
34+920	45.876
34+930	45.894
34+940	45.912
34+950	45.930
34+960	45.948
34+970	45.966

HORIZONTAL ALIGNMENT

34+000 34+010 34+020 34+030 34+040 34+050 34+060 34+070 34+080 34+090 34+100 34+110 34+120 34+130 34+140 34+150 34+160 34+170 34+180 34+190 34+200 34+210 34+220 34+230 34+240 34+250 34+260 34+270 34+280 34+290 34+300 34+310 34+320 34+330 34+340 34+350 34+360 34+370 34+380 34+390 34+400 34+410 34+420 34+430 34+440 34+450 34+460 34+470 34+480 34+490 34+500 34+510 34+520 34+530 34+540 34+550 34+560 34+570 34+580 34+590 34+600 34+610 34+620 34+630 34+640 34+650 34+660 34+670 34+680 34+690 34+700 34+710 34+720 34+730 34+740 34+750 34+760 34+770 34+780 34+790 34+800 34+810 34+820 34+830 34+840 34+850 34+860 34+870 34+880 34+890 34+900 34+910 34+920 34+930 34+940 34+950 34+960 34+970

Chief Engineer  
 W.B. Bank Project  
 E.C. (WB), Odisha  
 Bhubaneswar

**CONSULTING ENGINEER, WBPROUP LTD.**  
 UNDER WORLD BANK ASSISTANCE

**CEG**

PROJECT:-  
 WIDENING AND STRENGTHENING TO TWO LANE

ODISHA STATE ROAD PROJECT  
 UNDER WORLD BANK ASSISTANCE

REG. NO. 1000/2007  
 SN. NO. 1000/2007  
 DATE: 18/01/13  
 REV: 01  
 CTG: CTG  
 CE: WB  
 SCALE: HORIZONTAL: 1:2000  
 VERTICAL: 1:200

BLADRAK TO ANANDPUR BALANCE WORKS (S3) KM 34/000 TO KM 35/000

REVISIONS:  
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 2. [ ] REVISION OF CIRCULAR CURVE  
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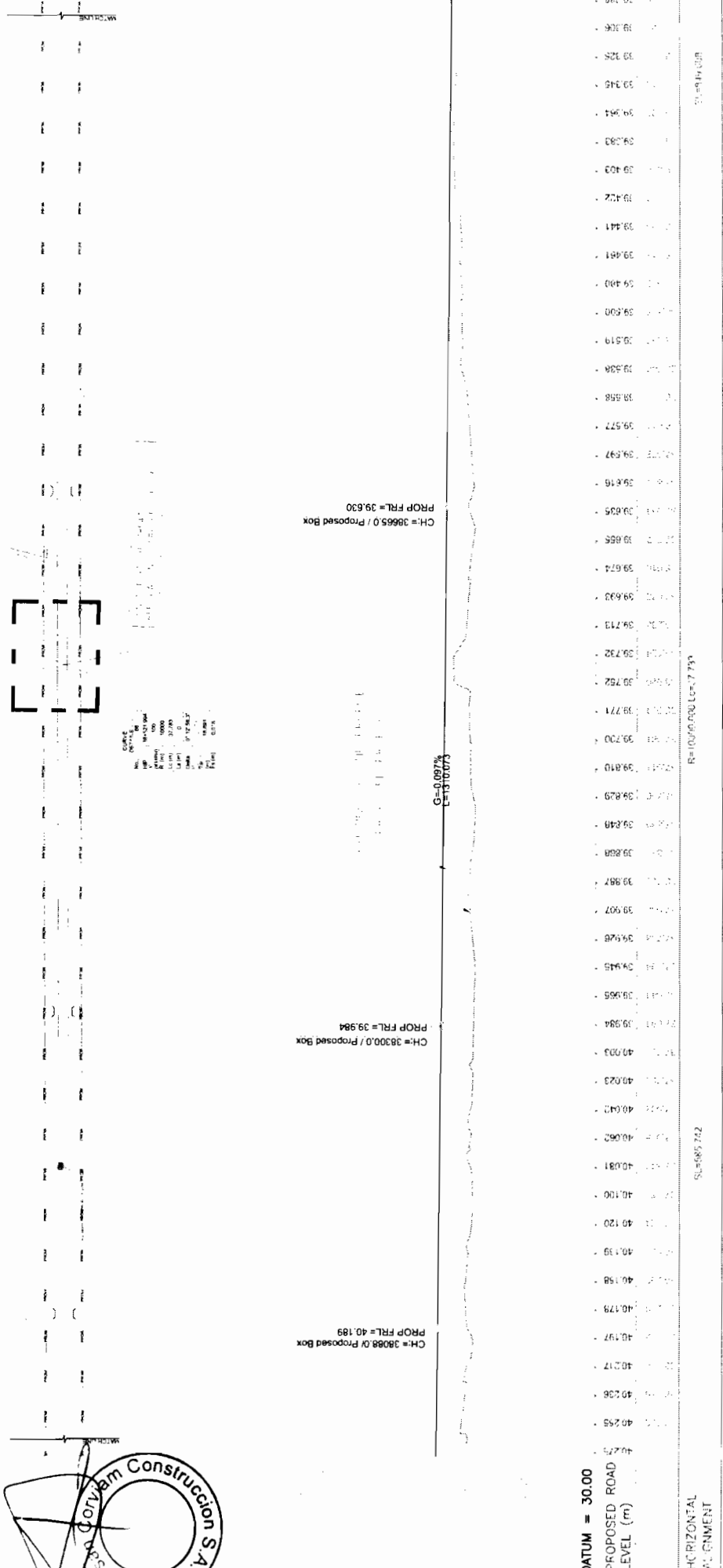
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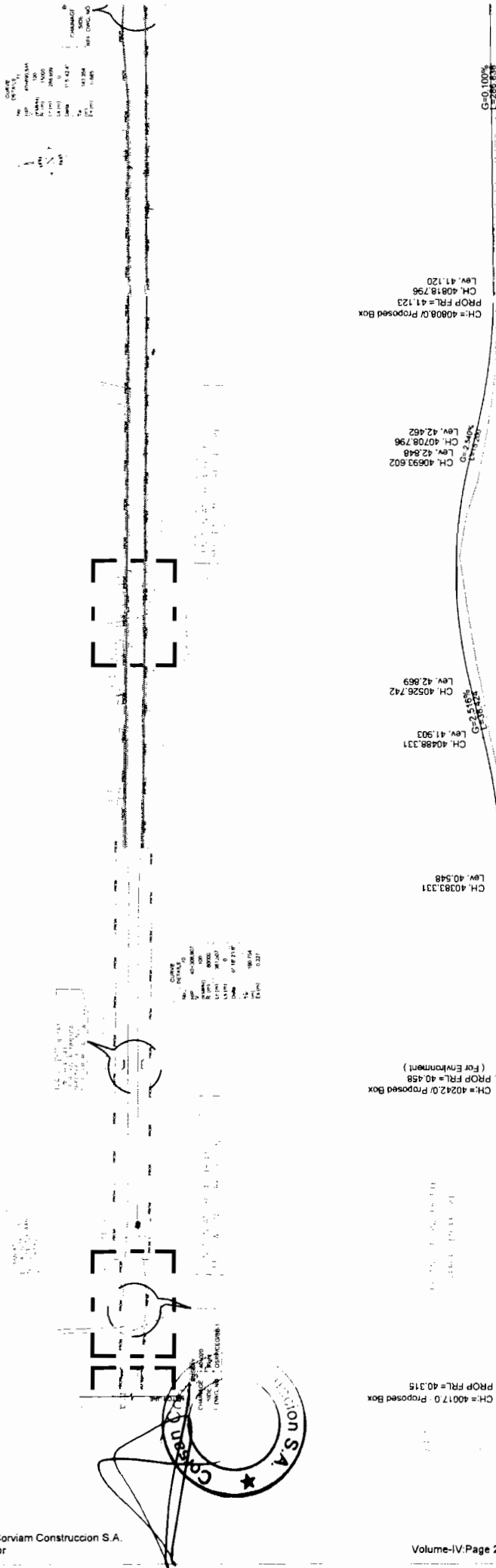












DATUM = 30.00

STATIONING	HORIZONTAL ALIGNMENT	PROPOSED ROAD LEVEL (m)
40+000		40.317
40+020		40.317
40+040		40.320
40+060		40.343
40+080		40.355
40+100		40.368
40+120		40.381
40+140		40.393
40+160		40.406
40+180		40.419
40+200		40.432
40+220		40.444
40+240		40.457
40+260		40.470
40+280		40.483
40+300		40.495
40+320		40.508
40+340		40.521
40+360		40.533
40+380		40.546
40+400		40.559
40+420		40.572
40+440		40.585
40+460		41.598
40+480		41.611
40+500		41.624
40+520		42.637
40+540		42.650
40+560		42.663
40+580		42.676
40+600		42.689
40+620		42.702
40+640		42.715
40+660		42.728
40+680		42.741
40+700		42.754
40+720		42.767
40+740		42.780
40+760		42.793
40+780		42.806
40+800		42.819
40+820		42.832
40+840		42.845
40+860		42.858
40+880		42.871
40+900		42.884
40+920		42.897
40+940		42.910
40+960		42.923
40+980		42.936
41+000		42.949

**WIDENING AND STRENGTHENING TO TWO LANE**

**CONSULTING PROJECT:-**  
**ENGINEERING, WBPROUD LTD.**  
**ODISHA STATE ROAD PROJECT**  
**UNDER WORLD BANK ASSISTANCE**

**CEG**

BIODIAGRAM TO ANNEALER BALANCE WORK(SH-43) AM 40590 TO AM 41000

DRC NO. 41 DATE: 18.01.13 REV R1  
S/N NO. HORIZONTAL: 1:2000  
SCALE VERTICAL: 1:200

CE WP  
EE PMU

SUPER ELEVATION CROSS FALL CHAINAGE

REVISIONS: 01, 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100







SCHEDULE OF SIGN POSTS

Sign Post ID	Description of the Sign Board	Challenge	Location		Remarks
			LL	RL	
SP-48	SPEED - 40	4228	-	-	
SP-49	SPEED - 50	4218	-	-	
SP-50	SPEED - 65	4211	-	-	
SP-51	SPEED - 75	4211	-	-	
SP-52	SPEED - 80	4211	-	-	
SP-53	SPEED - 90	4211	-	-	
SP-54	SPEED - 100	4211	-	-	
SP-55	SPEED - 110	4211	-	-	
SP-56	SPEED - 120	4211	-	-	
SP-57	SPEED - 130	4211	-	-	
SP-58	SPEED - 140	4211	-	-	
SP-59	SPEED - 150	4211	-	-	
SP-60	SPEED - 160	4211	-	-	
SP-61	SPEED - 170	4211	-	-	
SP-62	SPEED - 180	4211	-	-	
SP-63	SPEED - 190	4211	-	-	
SP-64	SPEED - 200	4211	-	-	
SP-65	SPEED - 210	4211	-	-	
SP-66	SPEED - 220	4211	-	-	
SP-67	SPEED - 230	4211	-	-	
SP-68	SPEED - 240	4211	-	-	
SP-69	SPEED - 250	4211	-	-	
SP-70	SPEED - 260	4211	-	-	
SP-71	SPEED - 270	4211	-	-	
SP-72	SPEED - 280	4211	-	-	
SP-73	SPEED - 290	4211	-	-	
SP-74	SPEED - 300	4211	-	-	
SP-75	SPEED - 310	4211	-	-	
SP-76	SPEED - 320	4211	-	-	
SP-77	SPEED - 330	4211	-	-	
SP-78	SPEED - 340	4211	-	-	
SP-79	SPEED - 350	4211	-	-	
SP-80	SPEED - 360	4211	-	-	
SP-81	SPEED - 370	4211	-	-	
SP-82	SPEED - 380	4211	-	-	
SP-83	SPEED - 390	4211	-	-	
SP-84	SPEED - 400	4211	-	-	
SP-85	SPEED - 410	4211	-	-	
SP-86	SPEED - 420	4211	-	-	
SP-87	SPEED - 430	4211	-	-	
SP-88	SPEED - 440	4211	-	-	
SP-89	SPEED - 450	4211	-	-	
SP-90	SPEED - 460	4211	-	-	
SP-91	SPEED - 470	4211	-	-	
SP-92	SPEED - 480	4211	-	-	
SP-93	SPEED - 490	4211	-	-	
SP-94	SPEED - 500	4211	-	-	
SP-95	SPEED - 510	4211	-	-	
SP-96	SPEED - 520	4211	-	-	
SP-97	SPEED - 530	4211	-	-	
SP-98	SPEED - 540	4211	-	-	
SP-99	SPEED - 550	4211	-	-	
SP-100	SPEED - 560	4211	-	-	
SP-101	SPEED - 570	4211	-	-	
SP-102	SPEED - 580	4211	-	-	
SP-103	SPEED - 590	4211	-	-	
SP-104	SPEED - 600	4211	-	-	
SP-105	SPEED - 610	4211	-	-	
SP-106	SPEED - 620	4211	-	-	
SP-107	SPEED - 630	4211	-	-	
SP-108	SPEED - 640	4211	-	-	
SP-109	SPEED - 650	4211	-	-	
SP-110	SPEED - 660	4211	-	-	
SP-111	SPEED - 670	4211	-	-	
SP-112	SPEED - 680	4211	-	-	
SP-113	SPEED - 690	4211	-	-	
SP-114	SPEED - 700	4211	-	-	
SP-115	SPEED - 710	4211	-	-	
SP-116	SPEED - 720	4211	-	-	
SP-117	SPEED - 730	4211	-	-	
SP-118	SPEED - 740	4211	-	-	
SP-119	SPEED - 750	4211	-	-	
SP-120	SPEED - 760	4211	-	-	
SP-121	SPEED - 770	4211	-	-	
SP-122	SPEED - 780	4211	-	-	
SP-123	SPEED - 790	4211	-	-	
SP-124	SPEED - 800	4211	-	-	
SP-125	SPEED - 810	4211	-	-	
SP-126	SPEED - 820	4211	-	-	
SP-127	SPEED - 830	4211	-	-	
SP-128	SPEED - 840	4211	-	-	
SP-129	SPEED - 850	4211	-	-	
SP-130	SPEED - 860	4211	-	-	
SP-131	SPEED - 870	4211	-	-	
SP-132	SPEED - 880	4211	-	-	
SP-133	SPEED - 890	4211	-	-	
SP-134	SPEED - 900	4211	-	-	
SP-135	SPEED - 910	4211	-	-	
SP-136	SPEED - 920	4211	-	-	
SP-137	SPEED - 930	4211	-	-	
SP-138	SPEED - 940	4211	-	-	
SP-139	SPEED - 950	4211	-	-	
SP-140	SPEED - 960	4211	-	-	
SP-141	SPEED - 970	4211	-	-	
SP-142	SPEED - 980	4211	-	-	
SP-143	SPEED - 990	4211	-	-	
SP-144	SPEED - 1000	4211	-	-	
SP-145	SPEED - 1010	4211	-	-	
SP-146	SPEED - 1020	4211	-	-	
SP-147	SPEED - 1030	4211	-	-	
SP-148	SPEED - 1040	4211	-	-	
SP-149	SPEED - 1050	4211	-	-	
SP-150	SPEED - 1060	4211	-	-	
SP-151	SPEED - 1070	4211	-	-	
SP-152	SPEED - 1080	4211	-	-	
SP-153	SPEED - 1090	4211	-	-	
SP-154	SPEED - 1100	4211	-	-	
SP-155	SPEED - 1110	4211	-	-	
SP-156	SPEED - 1120	4211	-	-	
SP-157	SPEED - 1130	4211	-	-	
SP-158	SPEED - 1140	4211	-	-	
SP-159	SPEED - 1150	4211	-	-	
SP-160	SPEED - 1160	4211	-	-	
SP-161	SPEED - 1170	4211	-	-	
SP-162	SPEED - 1180	4211	-	-	
SP-163	SPEED - 1190	4211	-	-	
SP-164	SPEED - 1200	4211	-	-	
SP-165	SPEED - 1210	4211	-	-	
SP-166	SPEED - 1220	4211	-	-	
SP-167	SPEED - 1230	4211	-	-	
SP-168	SPEED - 1240	4211	-	-	
SP-169	SPEED - 1250	4211	-	-	
SP-170	SPEED - 1260	4211	-	-	
SP-171	SPEED - 1270	4211	-	-	
SP-172	SPEED - 1280	4211	-	-	
SP-173	SPEED - 1290	4211	-	-	
SP-174	SPEED - 1300	4211	-	-	
SP-175	SPEED - 1310	4211	-	-	
SP-176	SPEED - 1320	4211	-	-	
SP-177	SPEED - 1330	4211	-	-	
SP-178	SPEED - 1340	4211	-	-	
SP-179	SPEED - 1350	4211	-	-	
SP-180	SPEED - 1360	4211	-	-	
SP-181	SPEED - 1370	4211	-	-	
SP-182	SPEED - 1380	4211	-	-	
SP-183	SPEED - 1390	4211	-	-	
SP-184	SPEED - 1400	4211	-	-	
SP-185	SPEED - 1410	4211	-	-	
SP-186	SPEED - 1420	4211	-	-	
SP-187	SPEED - 1430	4211	-	-	
SP-188	SPEED - 1440	4211	-	-	
SP-189	SPEED - 1450	4211	-	-	
SP-190	SPEED - 1460	4211	-	-	
SP-191	SPEED - 1470	4211	-	-	
SP-192	SPEED - 1480	4211	-	-	
SP-193	SPEED - 1490	4211	-	-	
SP-194	SPEED - 1500	4211	-	-	
SP-195	SPEED - 1510	4211	-	-	
SP-196	SPEED - 1520	4211	-	-	
SP-197	SPEED - 1530	4211	-	-	
SP-198	SPEED - 1540	4211	-	-	
SP-199	SPEED - 1550	4211	-	-	
SP-200	SPEED - 1560	4211	-	-	
SP-201	SPEED - 1570	4211	-	-	
SP-202	SPEED - 1580	4211	-	-	
SP-203	SPEED - 1590	4211	-	-	
SP-204	SPEED - 1600	4211	-	-	
SP-205	SPEED - 1610	4211	-	-	
SP-206	SPEED - 1620	4211	-	-	
SP-207	SPEED - 1630	4211	-	-	
SP-208	SPEED - 1640	4211	-	-	
SP-209	SPEED - 1650	4211	-	-	
SP-210	SPEED - 1660	4211	-	-	
SP-211	SPEED - 1670	4211	-	-	
SP-212	SPEED - 1680	4211	-	-	
SP-213	SPEED - 1690	4211	-	-	
SP-214	SPEED - 1700	4211	-	-	
SP-215	SPEED - 1710	4211	-	-	
SP-216	SPEED - 1720	4211	-	-	
SP-217	SPEED - 1730	4211	-	-	
SP-218	SPEED - 1740	4211	-	-	
SP-219	SPEED - 1750	4211	-	-	
SP-220	SPEED - 1760	4211	-	-	
SP-221	SPEED - 1770	4211	-	-	
SP-222	SPEED - 1780	4211	-	-	
SP-223	SPEED - 1790	4211	-	-	
SP-224	SPEED - 1800	4211	-	-	
SP-225	SPEED - 1810	4211	-	-	
SP-226	SPEED - 1820	4211	-	-	
SP-227	SPEED - 1830	4211	-	-	
SP-228	SPEED - 1840	4211	-	-	
SP-229	SPEED - 1850	4211	-	-	
SP-230	SPEED - 1860	4211	-	-	
SP-231	SPEED - 1870	4211	-	-	
SP-232	SPEED - 1880	4211	-	-	
SP-233	SPEED - 1890	4211	-	-	
SP-234	SPEED - 1900	4211	-	-	
SP-235	SPEED - 1910	4211	-	-	
SP-236	SPEED - 1920	4211	-	-	
SP-237	SPEED - 1930	4211	-	-	
SP-238	SPEED - 1940	4211	-	-	
SP-239	SPEED - 1950	4211	-	-	
SP-240	SPEED - 1960	4211	-	-	
SP-241	SPEED - 1970	4211	-	-	
SP-242	SPEED - 1980	4211	-	-	
SP-243	SPEED - 1990	4211	-	-	
SP-244	SPEED - 2000	4211	-	-	
SP-245	SPEED - 2010	4211	-	-	
SP-246	SPEED - 2020	4211	-	-	
SP-247	SPEED - 2030	4211	-	-	
SP-248	SPEED - 2040	4211	-	-	
SP-249	SPEED - 2050	4211	-	-	
SP-250	SPEED - 2060	4211	-	-	
SP-251	SPEED - 2070	4211	-	-	
SP-252	SPEED - 2080	4211	-	-	
SP-253	SPEED - 2090	4211	-	-	
SP-254	SPEED - 2100	4211	-	-	
SP-255	SPEED - 2110	4211	-	-	
SP-256	SPEED - 2120	4211	-	-	
SP-257	SPEED - 2130	4211	-	-	
SP-258	SPEED - 2140	4211	-	-	
SP-259	SPEED - 2150	4211	-	-	
SP-260	SPEED - 2160	4211	-	-	
SP-261	SPEED - 2170	4211	-	-	
SP-262	SPEED - 2180	4211	-	-	
SP-263	SPEED - 2190	4211	-	-	
SP-264	SPEED - 2200	4211	-	-	
SP-265	SPEED - 2210	4211	-	-	
SP-266	SPEED - 2220	4211	-	-	
SP-267	SPEED - 2230	4211	-	-	
SP-268	SPEED - 2240	4211	-	-	
SP-269	SPEED - 2250	4211	-	-	
SP-270	SPEED - 2260	4211	-	-	
SP-271	SPEED - 2270	4211	-	-	
SP-272	SPEED - 2280	4211	-	-	
SP-273	SPEED - 2290	4211	-	-	
SP-274	SPEED - 2300	4211	-	-	
SP-275	SPEED - 2310	4211	-	-	
SP-276	SPEED - 2320	4211	-	-	
SP-277	SPEED - 2330	4211	-	-	
SP-278	SPEED - 2340	4211	-	-	
SP-279	SPEED - 2350	4211	-	-	
SP-280	SPEED - 2360	4211	-	-	
SP-281	SPEED - 2370	4211	-	-	
SP-282	SPEED - 2380	4211	-	-	
SP-283	SPEED - 2390	4211	-	-	
SP-284	SPEED - 2400	4211	-	-	
SP-285	SPEED - 2410	4211	-	-	
SP-286	SPEED - 2420	4211	-	-	
SP-287	SPEED - 2430	4211	-	-	
SP-288	SPEED - 2440	4211	-	-	
SP-289	SPEED - 2450	4211	-	-	
SP-290	SPEED - 2460	4211	-	-	
SP-291	SPEED - 2470	4211	-	-	





SCHEDULE OF SIGN POSTS

Sign Post ID	Description of the Sign Board	Chainage		Location		Remarks
		LL	RL	CR(L)	CR(R)	
SP-14 B	Y - INTERSECTION	8559	9624	1	1	
SP-14 C	Y - INTERSECTION	19302	29851	1	1	
SP-15 A	NARROW BRIDGE	31688	38643	1	1	
SP-16 A	HUMP OR ROUGH ROAD	40467	42320	1	1	
SP-17	STATE ROUTE	6359	10000	1	1	
SP-20	REASSURANCE SIGN MARKER SIGN	19505	20000	1	1	
SP-22	PETROL BUNK	31488	39443	1	1	
SP-23	HOSPITAL	40667	42620	1	1	
SP-27	TRUCK LAYBY	18820	18960	1	1	
SP-28	TOLL PLAZA	30550	30690	1	1	
SP-33	WILD LIFE CROSSING (ENV)	36820	36860	1	1	
SP-40	REPTILE CROSSING (ENV)	36860	36900	1	1	
SP-45	WILD LIFE CROSSING (ENV)	37050	37190	1	1	
SP-49	REPTILE CROSSING (ENV)	37200	37340	1	1	
SP-50	FOREST CHECK GATE	17618	20216	1	1	
SP-51	FOREST CHECK GATE	20276	20334	1	1	

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. IN STANDARD DRAWINGS

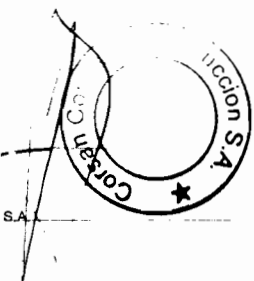
**SCHEDULE OF SIGN POSTS**

BHADRAK TO ANANDPUR -BALANCE WORK(SH-53, KM 0/00 TO 43/00)

DESIGNED BY	CEG	DRAWN BY	REV/1	APPROVED
SH. NO.	55	DATE	6.01.13	REV
SCALE	NTS			

**PROJECT:-**  
 ODISHA STATE ROAD PROJECT  
 UNDER WORLD BANK ASSISTANCE.

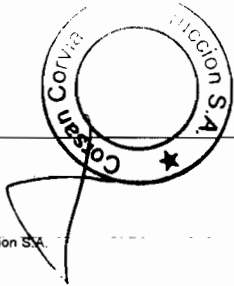
**CONSULTING ENGINEER, WB GROUP LTD.**  
 E-12, Moj Colony, Malviya Nagar, Jaipur-17  
 Tel: +91-141-2520899, 2520556  
 Fax: 2521348, e-mail: ceg@ceginia.com



Corsan Convia Construction S.A.  
 Contractor

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

SCHEDULE OF GUARD POSTS & EXTRA WIDENING



Corsan Corviam Construccion S.A.  
Contractor

SCHEDULE OF LOCATIONS FOR GUARD POSTS

S.No	Chainage		Length	Side
	From	To		
1	17000	17000	30	Right
2	18000	18000	30	Right
3	20000	20000	30	Right
4	22000	22000	30	Right
5	24000	24000	30	Right
6	26000	26000	30	Right
7	28000	28000	30	Right
8	30000	30000	30	Right
9	32000	32000	30	Right
10	34000	34000	30	Right
11	36000	36000	30	Right
12	37700	37700	30	Right

NOTE: GUARD POSTS SHALL BE PROVIDED AS PER THE CHAINAGE IN COMP/250/70 & SP. CHAINAGE IN COMP/250/70 & SP. GUARD POSTS SHALL BE PROVIDED AT ALL THE SETBACKS. BRIDGE LOCATIONS AS PER DRAWING NO. COMP/250/70.

SCHEDULE OF EXTRA WIDENING

S.No	Chainage		Width	Side	Slope	Slope Out	Extra
	From	To					
1	21000.00	21000.00	2.00	Right	1:50	50	0.8
2	22000.00	22000.00	2.00	Right	1:50	50	0.8
3	23000.00	23000.00	2.00	Right	1:50	50	0.8
4	24000.00	24000.00	2.00	Right	1:50	50	0.8
5	25000.00	25000.00	2.00	Right	1:50	50	0.8
6	26000.00	26000.00	2.00	Right	1:50	50	0.8
7	27000.00	27000.00	2.00	Right	1:50	50	0.8
8	28000.00	28000.00	2.00	Right	1:50	50	0.8
9	29000.00	29000.00	2.00	Right	1:50	50	0.8
10	30000.00	30000.00	2.00	Right	1:50	50	0.8
11	31000.00	31000.00	2.00	Right	1:50	50	0.8
12	32000.00	32000.00	2.00	Right	1:50	50	0.8
13	33000.00	33000.00	2.00	Right	1:50	50	0.8
14	34000.00	34000.00	2.00	Right	1:50	50	0.8
15	35000.00	35000.00	2.00	Right	1:50	50	0.8
16	36000.00	36000.00	2.00	Right	1:50	50	0.8
17	37000.00	37000.00	2.00	Right	1:50	50	0.8
18	38000.00	38000.00	2.00	Right	1:50	50	0.8
19	39000.00	39000.00	2.00	Right	1:50	50	0.8
20	40000.00	40000.00	2.00	Right	1:50	50	0.8

NOTE:  
1. EXTRA WIDENING HAS BEEN DONE AS PER THE CHAINAGE INDICATED IN B.C.75-1000  
2. WIDENING SHALL BE DONE EQUALLY ON BOTH THE INNER AND OUTER CURVES  
3. THE SLOPE OF THE CONCRETE SHALL EXTEND IN THE WIDENING SECTIONS

PROJECT:-

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE.

**CONSULTING**  
**ENGINEER, WBP GROUP LTD.**  
E-12, Meji Colony, Malviya Nagar Jaipur-17  
Tel: +91-141-2520899, 2521899, 2520556  
Fax: 2521048, e-mail: ceg@ceginfolia.com

SCHEDULE OF GUARD POSTS  
AND EXTRA WIDENING  
BHADRAK TO ANANDPUR - BALANCE WORK(SH-53, KM 0/00 TO 43/00)

DRG NO.	DESIGNED BY	DRAWN BY	REV.1	APPROVED
SH. NO. 57	DATE 18.01.13	REV. I R1	CEG	EE, PMU CE, WBP
SCALE	NTS		CEG	CEG

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

Sl No	Prop Chainage		Length in KM	Thickness Design (IRC-37) - FLEXIBLE PAVEMENT										Type of Construction	Remark				
	From	To		Crest details Over existing Pavement					Crest details Over existing Pavement										
	Sub base	Base		WMM1	WMM2	GSB	Subgrade	Embankment fill	Total Thickness	Surface Course	BC	DBM	WMM1			WMM2	GSB	Subgrade	Total Thickness
1	0.20	2.10	1.9	40	100	100	150	200	500	1090	40	100	100	150	200	500	1090	New Construction	
2	2.10	4.30	2.2	40	100	100	150	200	500	1090	40	100	100	150	200	500	1090	New Construction	Realign
3	4.30	6.15	1.9	40	100	100	150	200	500	1090	40	100	100	150	200	500	1090	New Construction	PROFILE & ALIGN
4	6.15	7.35	1.2	40	100	100	150	200	500	1090	40	100	100	150	200	500	1090	New Construction	Realign
5	7.35	8.40	1.1	40	100	100	150	200	500	1090	40	100	100	150	200	500	1090	New Construction	Realign
6	8.40	9.75	1.4	40	50	100	150	200	500	1540	40	50	100	150	200	500	1540	New Construction	PROFILE & ALIGN
7	9.75	10.20	0.4	40	50	100	150	200	500	1040	40	50	100	150	200	500	1040	New Construction	DFS
8	10.20	10.90	0.7	40	50	100	150	200	500	1040	40	50	100	150	200	500	1040	New Construction	Realign
9	10.90	11.60	0.7	40	50	100	150	200	500	1040	40	50	100	150	200	500	1040	New Construction	Realign
10	11.60	12.65	1.1	40	50	100	150	200	500	1040	40	50	100	150	200	500	1040	New Construction	DFS
11	12.65	13.65	1.0	40	50	100	150	200	500	1040	40	50	100	150	200	500	1040	New Construction	DFS
12	13.65	16.65	3.0	40	50	100	150	200	500	1040	40	50	100	150	200	500	1040	New Construction	PROFILE & ALIGN
13	16.65	20.55	3.9	40	50	100	150	200	500	1040	40	50	100	150	200	500	1040	New Construction	DFS
14	20.55	21.50	0.9	40	50	100	150	200	500	1040	40	50	100	150	200	500	1040	New Construction	DFS
15	21.50	23.55	2.1	40	50	100	150	200	500	1040	40	50	100	150	200	500	1040	New Construction	DFS
16	23.55	24.60	1.1	40	50	100	150	200	500	1040	40	50	100	150	200	500	1040	New Construction	DFS
17	24.60	25.55	0.9	40	50	100	150	200	500	1040	40	50	100	150	200	500	1040	New Construction	DFS
18	25.55	26.66	1.1	40	50	100	150	200	500	1040	40	50	100	150	200	500	1040	New Construction	PROFILE & ALIGN
19	26.66	28.60	1.9	40	50	100	150	200	500	1040	40	50	100	150	200	500	1040	New Construction	PROFILE & ALIGN
20	28.60	29.60	1.0	40	50	100	150	200	500	1040	40	50	100	150	200	500	1040	New Construction	Realign
21	29.60	32.25	2.7	40	50	100	150	200	500	1040	40	50	100	150	200	500	1040	New Construction	Realign
22	32.25	37.89	5.6	40	50	100	150	200	500	1040	40	50	100	150	200	500	1040	New Construction	Realign
23	37.89	39.45	1.6	40	50	100	150	200	500	1040	40	50	100	150	200	500	1040	New Construction	DFS
24	39.45	38.45	1.0	40	50	100	150	200	500	1040	40	50	100	150	200	500	1040	New Construction	DFS
25	38.45	35.05	3.4	40	50	100	150	200	500	1040	40	50	100	150	200	500	1040	New Construction	PROFILE & ALIGN
26	35.05	37.26	2.2	40	50	100	150	200	500	1040	40	50	100	150	200	500	1040	New Construction	PROFILE & ALIGN
27	37.26	39.17	1.9	40	50	100	150	200	500	1040	40	50	100	150	200	500	1040	New Construction	PROFILE & ALIGN
28	39.17	42.30	3.1	40	50	100	150	200	500	1040	40	50	100	150	200	500	1040	New Construction	Realign
29	42.30	44.26	2.0	40	50	100	150	200	500	1040	40	50	100	150	200	500	1040	New Construction	Realign
30	44.26	45.41	1.2	40	50	100	150	200	500	1040	40	50	100	150	200	500	1040	New Construction	DFS
31	45.41	47.41	2.0	40	50	100	150	200	500	1040	40	50	100	150	200	500	1040	New Construction	DFS
32	47.41	49.45	2.0	40	50	100	150	200	500	1040	40	50	100	150	200	500	1040	New Construction	DFS

Note:  
1. The pavement design has been based on IRC : 37 - 2001 & IRC 81 - 1997  
2. The Borrowed CBR (not less than 10) shall be used for new Construction Section.  
3. Existing subgrade shall be used where the reconstruction are proposed.  
4. The Typical Cross Sections applicable for different sections are given in STANDARD DRAWING SET.  
5. Limited drain with 10 m (7m center to center) shall be provided refer Draw No. TCS-4, TCS-5, TCS-6

PROJECT: ODISHA STATE ROAD PROJECT

SCHEDULE OF PAVEMENT COMPOSITION

DESIGNED BY: DR. P. K. SINGH, Bhubaneswar

CHECKED BY: B. S. SINGH, Bhubaneswar

DATE: 28/12/2012

SCALE: 1:1000

APPROVED BY: [Signature]

DATE: 28/12/2012

PROJECT: ODISHA STATE ROAD PROJECT

DESIGNED BY: DR. P. K. SINGH, Bhubaneswar

CHECKED BY: B. S. SINGH, Bhubaneswar

DATE: 28/12/2012

SCALE: 1:1000

APPROVED BY: [Signature]

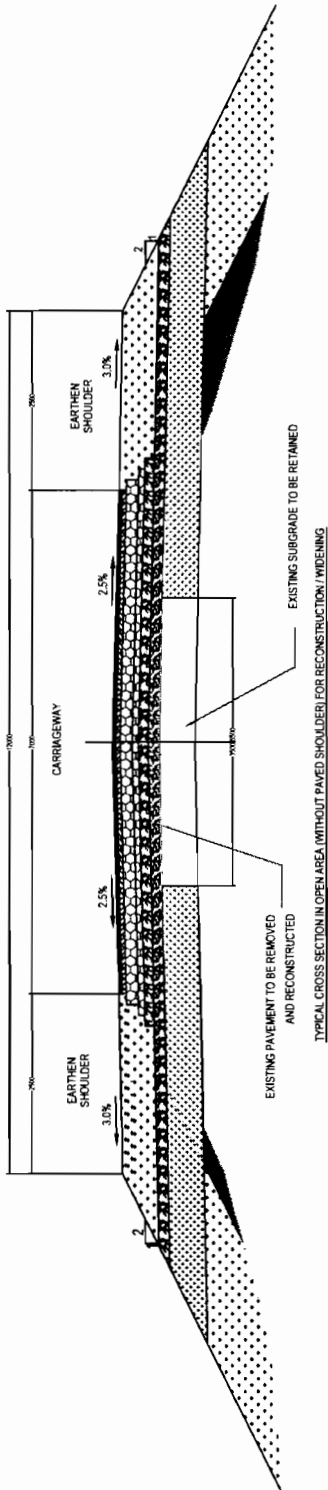
DATE: 28/12/2012

# DETAILED PAVEMENT TCS SCHEDULE FOR BHADRAK - ANANDPUR (SH-53)

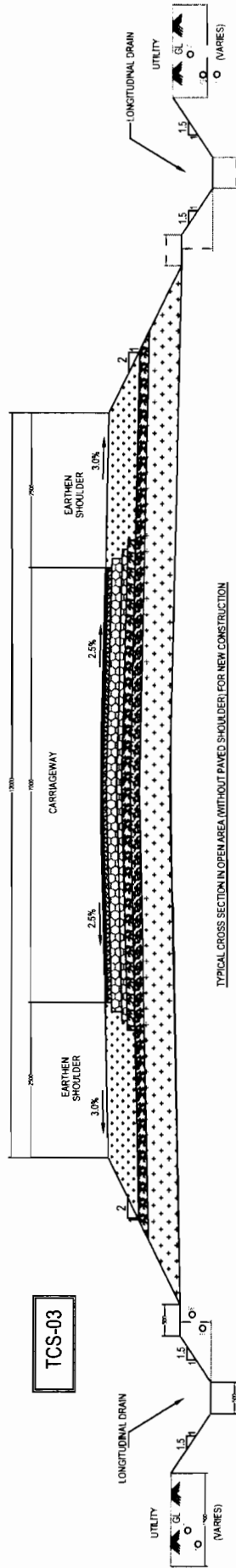
Sl. No.	Proposed Chainage		Distance in mts	Type of Construction	Type of Area	TCS	Sl. No.	Proposed Chainage		Distance in mts	Type of Construction	Type of Area	TCS
	From	To						From	To				
1	200	1800	1600	New Construction	OPEN	9	32	26600	27100	500	Reconstruction	OPEN	2
2	1800	2700	900	New Construction	BUILT	39	33	27100	28600	1500	Reconstruction	BUILT	38
3	2700	3300	600	ROB			34	28600	29600	1000	New Construction	BUILT	39
4	3300	4300	1000	New Construction	BUILT	39	35	29600	30500	900	Reconstruction	BUILT	38
5	4300	6150	1850	Reconstruction	OPEN	8	36	30500	30900	400	Reconstruction	OPEN	2
6	6150	7350	1200	New Construction	OPEN	9	37	30900	32250	1350	Reconstruction	BUILT	38
7	7350	8400	1050	Reconstruction	BUILT	38	38	32250	32400	150	New Construction	BUILT	39
8	8400	8850	450	New Construction_DFS	BUILT	33	39	32400	32750	350	New Construction	OPEN	3
9	8850	9750	900	New Construction_DFS	OPEN	18	40	32750	33100	350	New Construction	BUILT	39
10	9750	10200	450	New Construction	OPEN	3	41	33100	33450	350	New Construction	OPEN	3
11	10200	10900	700	Reconstruction	OPEN	2	42	33450	33650	200	New Construction_DFS	OPEN	18
12	10900	11600	700	New Construction	OPEN	3	43	33650	34100	450	New Construction_DFS	BUILT	33
13	11600	11900	300	Reconstruction	BUILT	38	44	34100	34450	350	New Construction_DFS	OPEN	18
14	11900	12650	750	Reconstruction	OPEN	2	45	34450	35050	600	Reconstruction	OPEN	2
15	12650	13300	650	New Construction_DFS	OPEN	18	46	35050	35500	450	New Construction	BUILT	39
16	13300	13650	350	New Construction_DFS	BUILT	33	47	35500	36400	900	New Construction	OPEN	3
17	13650	13850	200	Reconstruction	BUILT	38	48	36400	39200	2800	New Construction	OPEN	3
18	13850	16650	2800	Reconstruction	OPEN	2	49	39200	39900	700	Reconstruction	OPEN	2
19	16650	17100	450	New Construction	BUILT	39	50	39900	40100	200	Reconstruction	BUILT	38
20	17100	17520	420	New Construction	OPEN	3	51	40100	40400	300	Reconstruction	OPEN	2
21	17520	20550	3030	New Construction	BUILT	39	52	40400	42300	1900	Reconstruction	BUILT	38
22	20550	20700	150	New Construction_DFS	BUILT	33	53	42300	44600	2300	New Construction	OPEN	3
23	20700	21500	800	New Construction_DFS	OPEN	18	54	44600	45400	800	New Construction	BUILT	39
24	21500	23550	2050	New Construction	OPEN	3	55	45400	45550	150	New Construction_DFS	BUILT	33
25	23550	24000	450	New Construction_DFS	OPEN	18	56	45550	46800	1250	New Construction_DFS	OPEN	18
26	24000	24350	350	New Construction_DFS	BUILT	33	57	46800	47100	300	New Construction_DFS	BUILT	33
27	24350	24600	250	New Construction_DFS	OPEN	18	58	47100	47400	300	New Construction_DFS	OPEN	18
28	24600	25450	850	New Construction	OPEN	3	59	47400	48150	750	New Construction	OPEN	3
29	25450	25550	100	New Construction	BUILT	39	60	48150	48450	300	New Construction	BUILT	39
30	25550	26100	550	New Construction_DFS	BUILT	33	61	48450	49450	1000	New Construction	OPEN	3
31	26100	26600	500	New Construction_DFS	OPEN	18							

PROJECT:-		OSRP/CEG/SH-16/SCH/PAV	APPROVED
DRG NO.	39	DATE : 28/12/2012	REV R1
SH.NO.		REV :	PREPARED BY
SCALE		R1	EE/PMU
ORISSA STATE ROAD PROJECT		REV R0	CEG Ltd.
		PREPARED BY	CE, World Bank Projects.

TCS-02



TCS-03



LEGENDS

- |             |                            |                           |
|-------------|----------------------------|---------------------------|
| 1) BC       | 6) DLC                     | 12) W - Water Supply Line |
| 2) DBM      | 7) PCC                     | 13) G - Gas Line          |
| 3) WMM      | 8) EARTH FILL              | 14) S - Sewer             |
| 4) GSB      | 9) SAND FILL               |                           |
| 5) SUBGRADE | 10) E - Electrically Cable |                           |
|             | 11) T - Telecom Cable      |                           |

PROJECT:-

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK

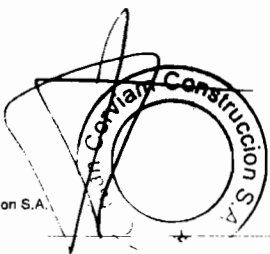
**CONSULTING ENGINEER, WB GROUP LTD**  
E-12, Moj Colony, Malviya Nagar, Jaipur-17  
Tel: +91-141-2520899, 2521899, 2520556  
Fax: 2521348, e-mail: ceg@cegindia.com



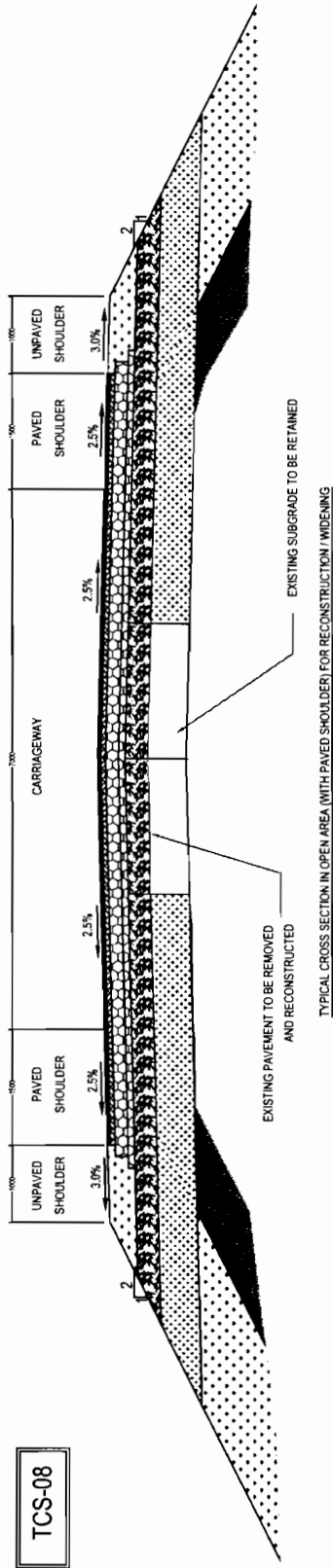
TYPICAL CROSS-SECTION

TCS - 02 & TCS - 03  
(BHAWANIPATNA - KHARIAR)

DRG NO.	08RPRCEGTCS02A03	DESIGNED BY	CEG	DRAWN BY	CEG	REV. R1	APPROVED
SH. NO.	01	DATE	18/01/13	REV	R-1	EE-PMU	CE-WBP
SCALE	NTS						

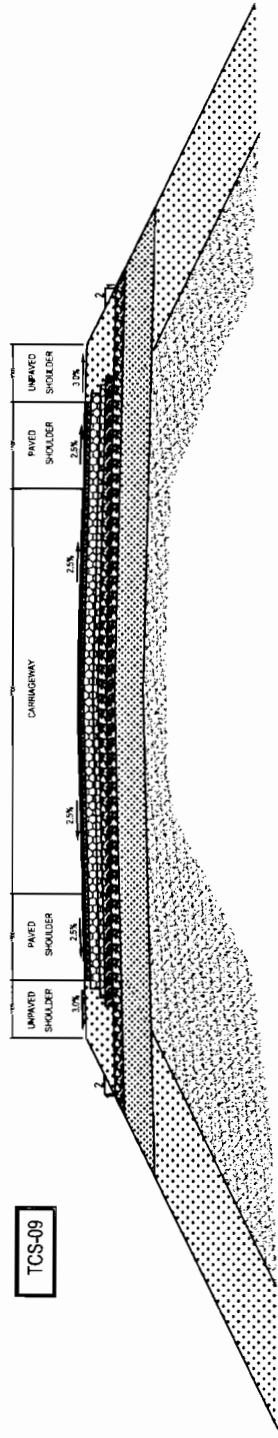


**TCS-08**



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

**TCS-09**



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

1. ALL DIMENSIONS ARE IN MILLIMETERS
2. FOR DRAIN DETAILS REFER DRAWING NO. OSR/PC/EG/DR
3. FOR LAYER THICKNESS DETAILS REFER SCHEDULE OF WIDENING AND LAYER THICKNESS DETAILS
4. THE CROSS SECTIONS SHALL BE READ WITH DETAILS OF TRANSITION BETWEEN RIGID AND FLEXIBLE REFER DRAWING NO. OSR/PC/EG/RIGID/02.
5. FOR PAVEMENT EDGE DETAILS REFER DRAWING NO. OSR/PC/EG/03
6. PROFILE CORRECTIVE COURSE WITH THE MATERIAL SAME AS THAT OF OVERLAYING LAYER ABOVE IT.
7. IN CASE THE UTILITIES/TREES OBSTRUCTING THE LONGITUDINAL DRAINS, THE DRAINS MAY BE DIVERTED AS PER ENGINEERS DIRECTIONS

**LEGENDS**

1) BC	8) D/C	11) W - Water Supply Line
2) DM	7) PCC	12) G - Gas Line
3) M/M	8) EARTH FILL	13) S - Sewer
4) GSB	9) E - Electricity Cable	
5) SUBGRADE	10) T - Telecom Cable	

**PROJECT:-**

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK

**TYPICAL CROSS-SECTION**

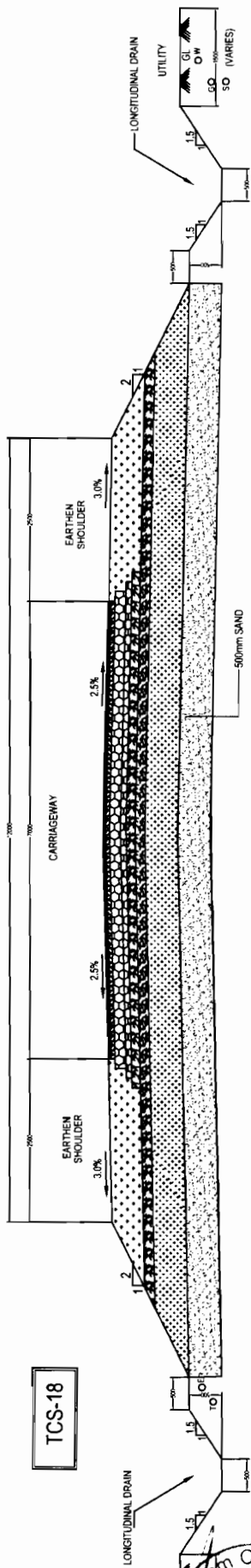
**TCS - 08 & 09**  
**(BHADRAK-ANANDPUR-BALANCE WORK)**

DRG. NO.	OSR/PC/EG/DR/09	DESIGNED BY	CEG	REV	R-1	DATE	18/01/13	REV		APPROVED	
SH. NO.	05	SCALE	NTS	DESIGNED BY	EE/PMU	DATE		REV	CE/WRP	APPROVED	

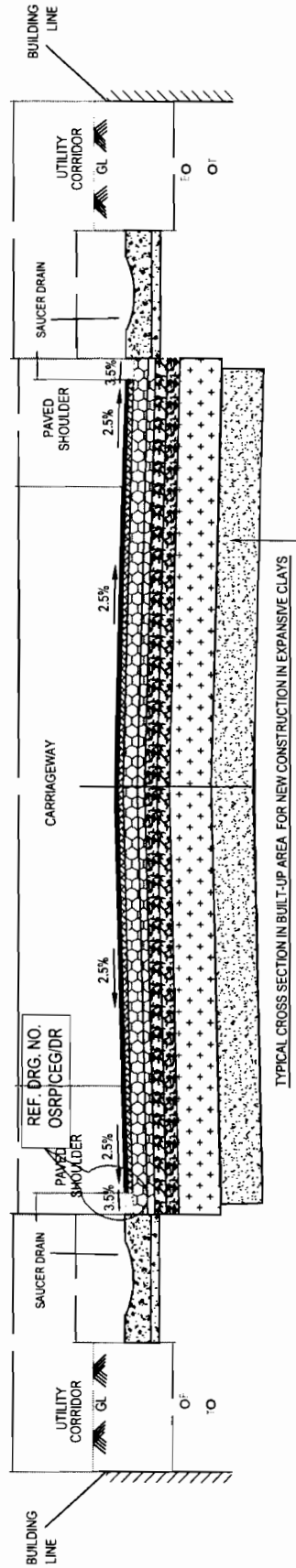
**CON S U L T I N G  
ENGINEER, WB GROUP LTD.**  
E-12, Moji Colony, Malviya Nagar Jaipur-17  
Tel: +91-141-2520899, 2521899, 2520556  
Fax: 2521348, e-mail: ceg@cegindia.com



World Bank Project  
Employer  
Oro the E.I.C. (Civil), Bhubaneswar.



TYPICAL CROSS SECTION IN OPEN AREA (WITHOUT PAVED SHOULDER) FOR NEW CONSTRUCTION IN EXPANSIVE CLAYS



1. ALL DIMENSIONS ARE IN MILLIMETERS
2. FOR DRAIN DETAILS REFER DRAWING NO.OSR/PC/EG/DR
3. FOR LAYER THICKNESS DETAILS REFER 'SCHEDULE OF WIDENING AND LAYER THICKNESS DETAILS'
4. THE CROSS SECTIONS SHALL BE READ WITH DETAILS OF TRANSITION BETWEEN RIGID AND FLEXIBLE REFER DRAWING NO.OSR/PC/EG/RIGID/02.
5. FOR PAVEMENT EDGE DETAILS REFER DRAWING NO.OSR/PC/EG/03
6. PCC-PROFILE CORRECTIVE COURSE WITH THE MATERIAL SAME AS THAT OF OVERLAYING LAYER ABOVE IT.
7. INCREASE THE UTILITIES/TREES OBSTRUCTING THE LONGITUDINAL DRAINS. THE DRAINS MAY BE DIVERTED AS PER ENGINEERS DIRECTIONS

**LEGENDS**

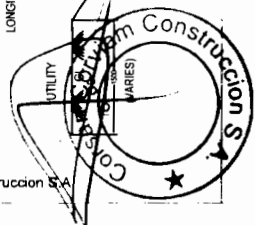
1) BC	6) BLC	11) W - Water Supply Line
2) DBM	7) PCC	12) G - Gas Line
3) WMM	8) EARTH FILL	13) S - Sewer
4) USB	9) E - Electricity Cable	
5) SUBGRADE	10) T - Telecom Cable	

**PROJECT:-**  
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK

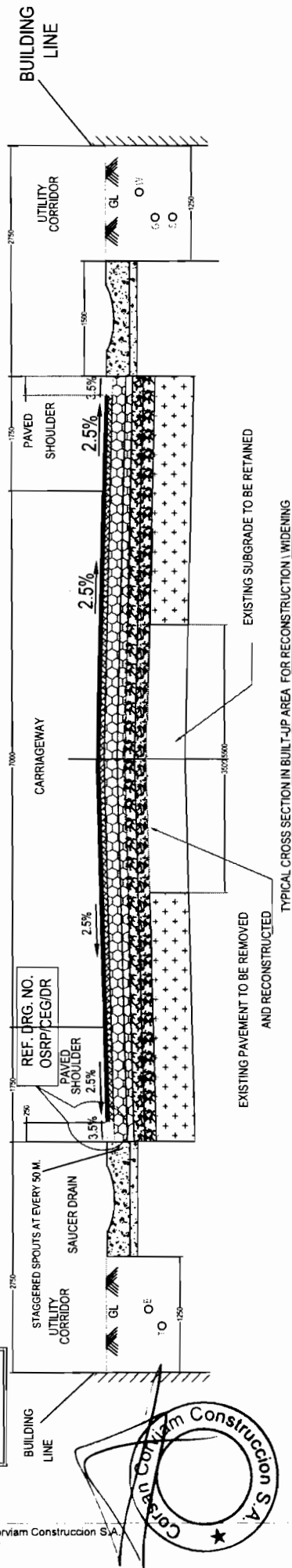
**CEG CONSULTING ENGINEER, WB GROUP LTD**  
E-12, Moji Colony, Malviya Nagar Jaipur-17  
Tel: +91-141-2520899, 2521899, 2520556  
Fax: 2521348, e-mail: ceg@cegindia.com

**TYPICAL CROSS-SECTION**  
TCS - 18 & 33  
(BHADRAK-ANANDPUR-BALANCE WORK)

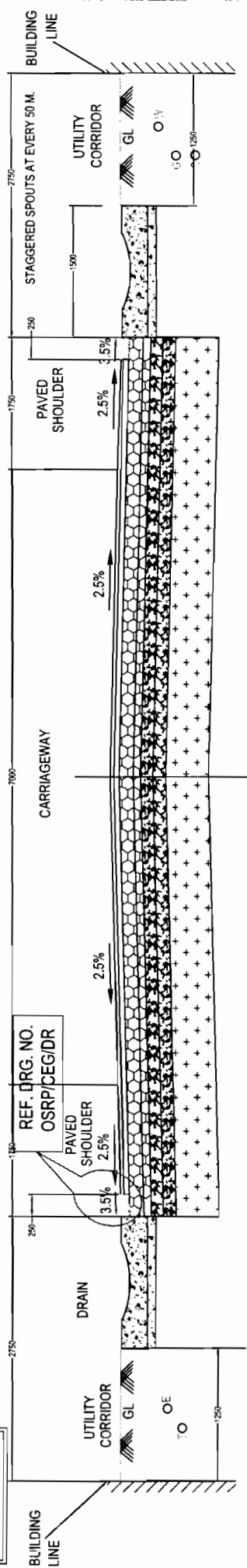
DRG NO.	OSR/PC/EG/CS/NA/23	REV	R-1	APPROVED
SH. NO.	05	DATE	18/07/13	REV
SCALE	NTS			EE, PMU
				CE, WBP



**TCS-38**



**TCS-39**



TYPICAL CROSS SECTION IN BUILT-UP AREA FOR NEW CONSTRUCTION

**LEGENDS**

1) BC	6) D/C	11) W - Water Supply Line
2) DBM	7) PCC	12) G - Gas Line
3) W/M	8) EARTH FILL	13) S - Sewer
4) GSB	9) SAND FILL	
5) SUBGRADE	10) E - Electricity Cable	
	11) T - Telecom Cable	

**PROJECT:-**

**ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK**

**TYPICAL CROSS-SECTION**

**TCS - 38 & TCS - 39**

**(BHADRAK-ANANDPUR-BALANCE WORK)**

DRG NO.	OSRP/CEG/DR	DATE	18/01/13	REV	R-1	DESIGNED BY	CEG	DRAWN BY	CEG	REV/RT	APPROVED	CE-WBP
SH. NO.	03	SCALE	NTS									

**CONSULTING ENGINEER, WB GROUP LTD**  
 E-12, Moji Colony, Malviya Nagar Jaipur-17  
 Tel: +91-141-2520899, 2521899, 2520556  
 Fax: 2521348, e-mail: ceg@ceginidia.com

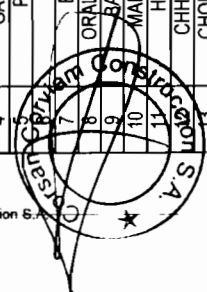
*Chief Engineer*  
 World Bank Project Officer  
 The E.I.C. Group of Companies  
 Bhubaneswar.



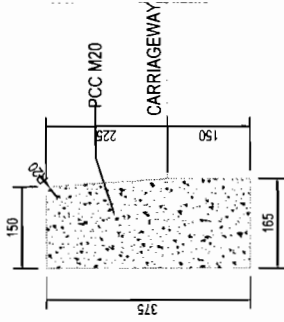
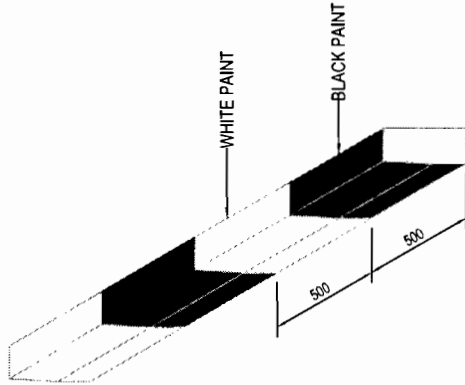
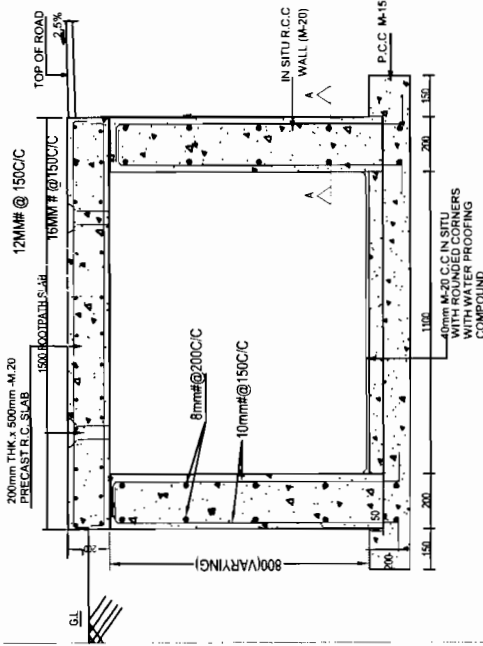


SCHEDULE OF LINED DRAIN

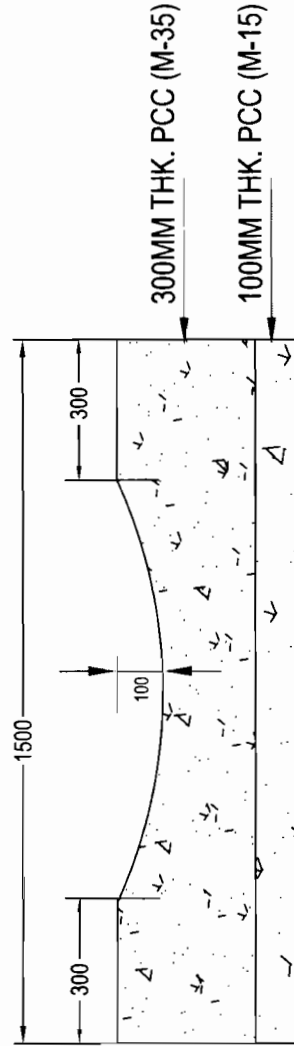
Sl.No.	Village Name	Proposed		Distance
		From	To	
1	BAGURAI	1800	2670	870
2	RANDIA	3330	4230	900
3	BARAPADA	7600	8850	1250
4	GANJANGA	11600	11900	300
5	PALASA	13320	13850	530
6	TILLO	16670	17100	430
7	BONTH	17520	20700	3180
8	ORALICHHAKA	24000	24330	330
9	BASANTIA	25450	26100	650
10	MAREIGAON	27100	27950	850
11	HATADHI	27950	30500	2550
12	CHHENAPADI	30920	32400	1480
13	CHORAGADIA	32750	33100	350
14	BANCHO JI	33650	34100	450
15	AMBAGADIA	35050	35500	450
16	CHALAVANTHI	39900	40100	200
17	FAKIRPUR&ANANDPUR	40400	42300	1900



DETAIL OF BOX DRAIN



1. FOR DETAILS OF LINED DRAINS REFER DWG. NO. OSRPF/CEGDR
2. THE PROVISION AND LENGTH OF THE LINED DRAIN SHALL BE REASSESSED DURING THE TIME OF CONSTRUCTION.
3. FOOTPATH BARRIERS SHALL BE PROVIDED AS PER DWG. NO. OSRPF/CEGTH
4. FOR BARRIERS OPENINGS SHALL BE PROVIDED
5. LINED DRAINS SCHEDULE SUPERSEDES THE PLAN.
6. ALL REINFORCEMENTS SHALL BE CONFIRMED TO IT-500



PRECAST SAUCER DRAIN

PROJECT:-

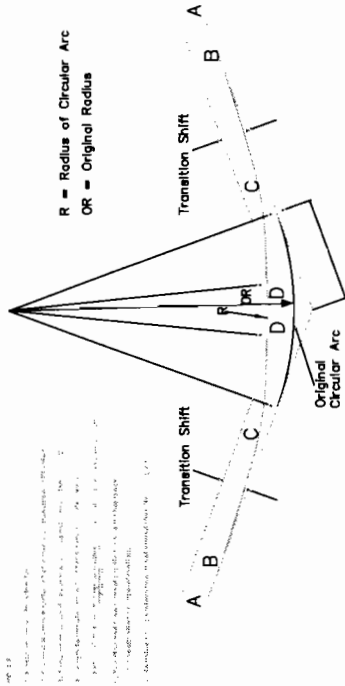
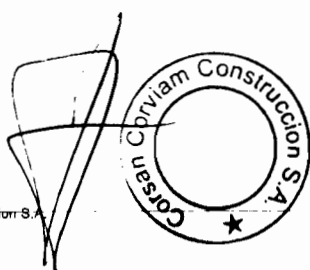
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK

**CONSUULTING ENGINEER, WBPROUP LTD**  
E-12, Mo ji Colony, Malviya Nagar, Jaipur-17  
Tel: +91-141-2520899, 2521899, 2520556  
Fax: 2521348, e-mail: ceg@ceindia.com

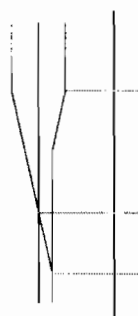


STANDARD DRAWINGS  
DETAILS OF DRAIN AND KERB  
(BHADRAK-ANANDPUR-BALANCE WORK)

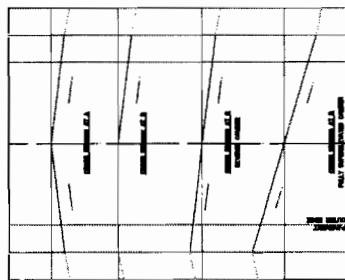
DRG. NO.	OSRPF/CEGDR	DESIGNED BY	DRAWN BY	REV. 1	APPROVED
SH. NO.	16	DATE	18/01/13	REV	R-1
SCALE				CEG	CEG
				EE/PMU	CE/WBP



**APPLICATION OF SUPERELEVATION**



**LONGITUDINAL SECTION THROUGH HORIZONTAL CURVE**



**PROJECT:-**

**ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK**

**CONSULTING  
ENGINEER, WB GROUP LTD**  
E-12, Moji Colony, Malviya Nagar, Jaipur-17  
Tel: +91-141-2520899, 2521899, 2520556  
Fax: 2521348, e-mail: ceg@cegingdia.com

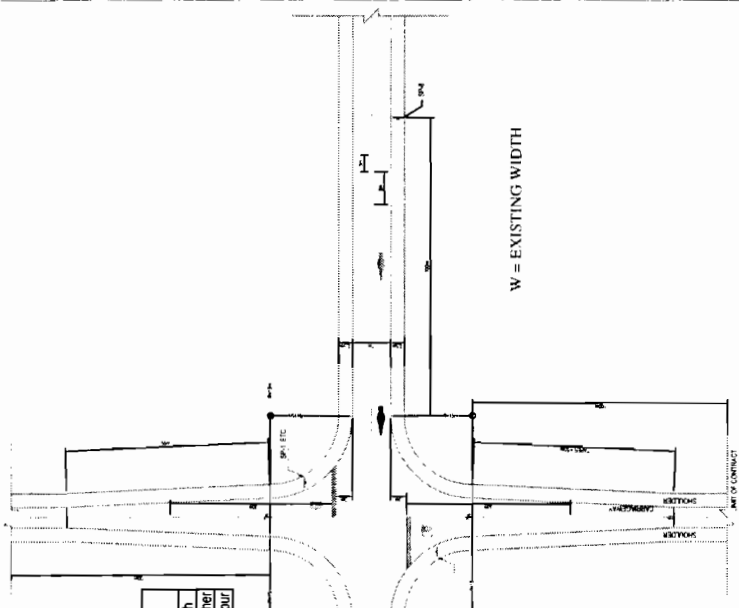


**DETAILS OF APPLICATION OF SUPERELEVATION**

DRG NO.	DATE	REV	DESIGNED BY	DRAWN BY	REV'D BY	APPROVED
SH. NO. 17	18/01/13	R-1	CEG	CEG	EE/PMU	CE/WBP
SCALE	NTS					

TYPICAL 4-LEGGED INTERSECTION

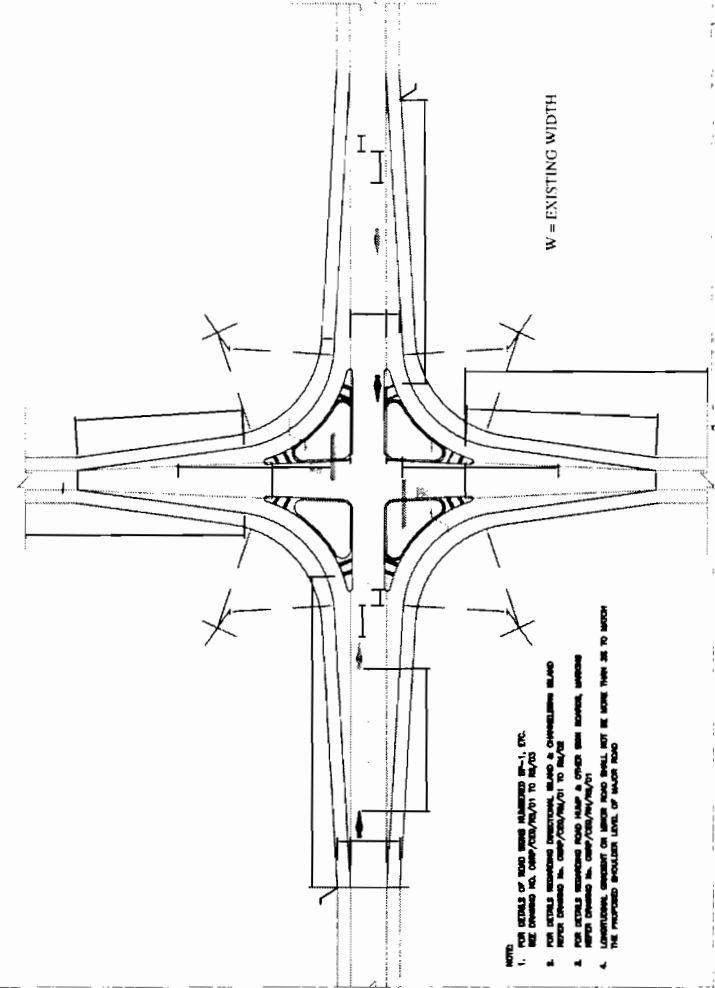
Chainage Proposed	Stk	Type	Type of Junction	Name of Village
1265	Both	BT	Cross	Pahesal & Janbath
447	Both	BT	Cross	Ramkrishnapur & Odher
1838	Both	BT	Cross	Bathanpada & Bithanapur



W = EXISTING WIDTH

W = EXISTING WIDTH

NOTE:  
1. FOR DETAILS OF ROAD MARKING REFER TO SP-1, ETC.  
2. SEE DRAWING NO. CEMP/323/RA/01 TO RA/03  
3. FOR DETAILS REGARDING DIRECTIONAL BOARD & CHANNELIZATION BOARD REFER DRAWING NO. CEMP/323/RA/01 TO RA/02  
4. FOR DETAILS REGARDING ROAD HUMP & OTHER ROAD STRUCTURE, REFER DRAWING NO. CEMP/323/RA/01 TO RA/02  
5. LANE WIDTH, WIDTH OF MAIN ROAD SHALL NOT BE MORE THAN 30% TO MATCH THE PROPOSED SHOULDER LEVEL OF MAIN ROAD



W = EXISTING WIDTH

NOTE:  
1. FOR DETAILS OF ROAD MARKING REFER TO SP-1, ETC.  
2. SEE DRAWING NO. CEMP/323/RA/01 TO RA/03  
3. FOR DETAILS REGARDING DIRECTIONAL BOARD & CHANNELIZATION BOARD REFER DRAWING NO. CEMP/323/RA/01 TO RA/02  
4. FOR DETAILS REGARDING ROAD HUMP & OTHER ROAD STRUCTURE, REFER DRAWING NO. CEMP/323/RA/01 TO RA/02  
5. LANE WIDTH, WIDTH OF MAIN ROAD SHALL NOT BE MORE THAN 30% TO MATCH THE PROPOSED SHOULDER LEVEL OF MAIN ROAD

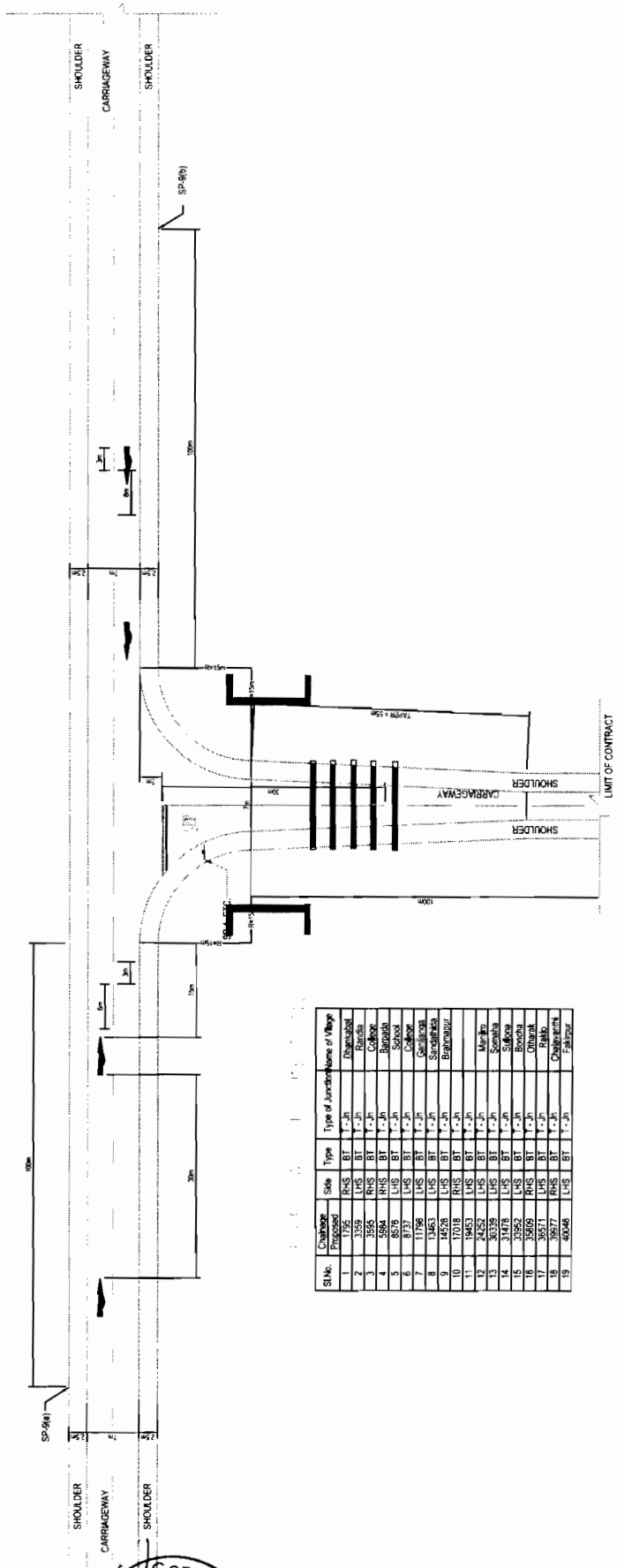
PROJECT:-

**ODISHA STATE ROAD PROJECT**  
UNDER WORLD BANK

STANDARD DRAWINGS  
TYPICAL 4-LEGGED INTERSECTION WITH  
WITH SINGLE LANE BT ROAD  
(BHADRAK-ANANDPUR-BALANCE WORK)

DRG NO. CEMP/323/RA/01	DESIGNED BY	CEG	DATE	18/01/13	REV	R-1	APPROVED	CE-WBP
SH. NO. 18	DRAWN BY	CEG					EE-PMU	
SCALE	NTS							

**CEG**  
**CONSULTING ENGINEER, WB GROUP LTD**  
E-12, Moji Colony, Malviya Nagar Jaipur-17  
Tel: +91-141-2520899, 2521899, 2520556  
Fax: 2521348, e-mail: ceg@ceginia.com



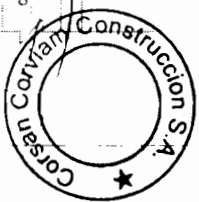
TYPE - A

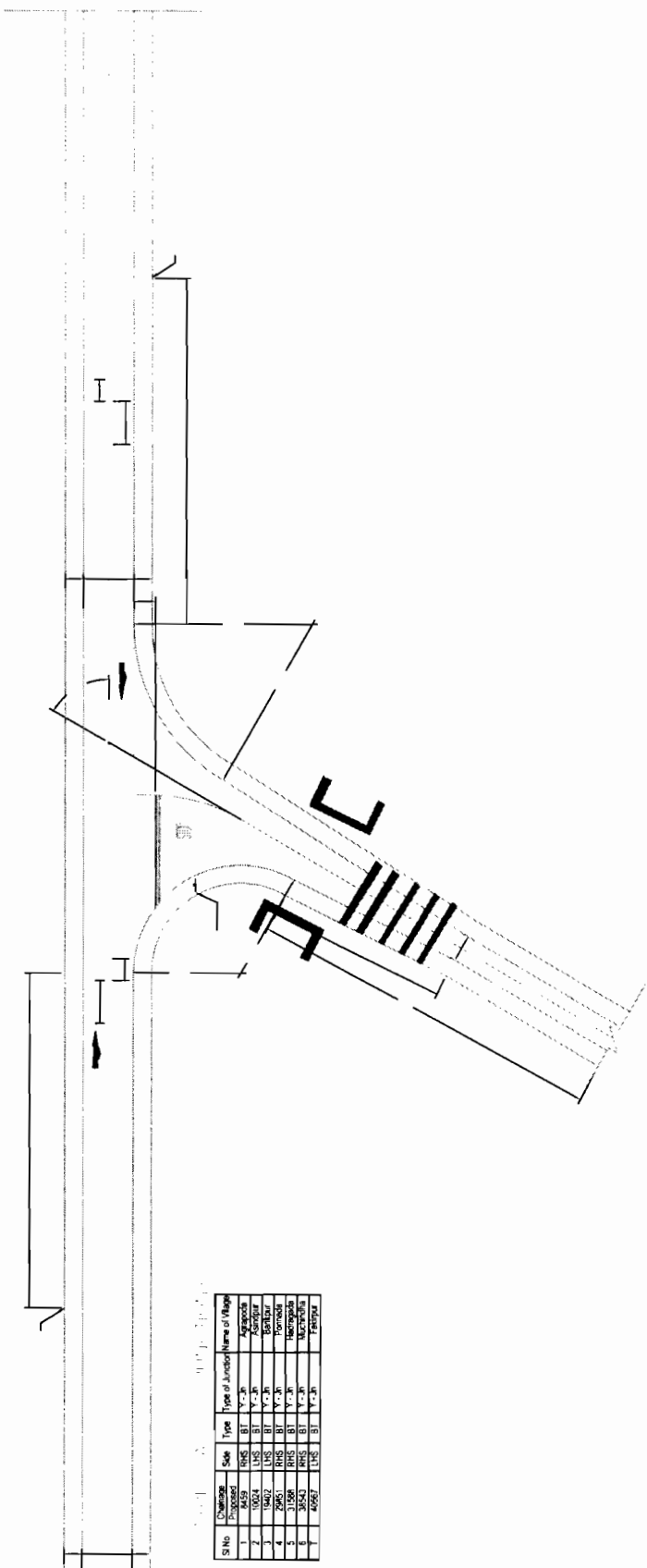
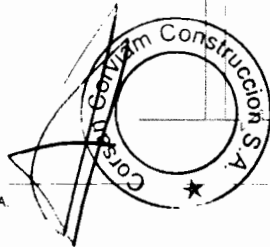
Sl. No.	Charge	Side	Type	Type of Junction	Name of Village
1	1756	RHS	BT	T-Jn	Dhansabai
2	3359	LHS	BT	T-Jn	Ransila
3	3554	RHS	BT	T-Jn	College
4	3884	RHS	BT	T-Jn	Banpali
5	875	LHS	BT	T-Jn	School
6	11706	LHS	BT	T-Jn	College
7	11706	LHS	BT	T-Jn	College
8	13463	LHS	BT	T-Jn	Shankhala
9	14628	LHS	BT	T-Jn	Barambarui
10	17018	RHS	BT	T-Jn	
11	19453	LHS	BT	T-Jn	Manin
12	24252	LHS	BT	T-Jn	Swanila
13	30338	LHS	BT	T-Jn	Sukra
14	32952	LHS	BT	T-Jn	Chand
15	32952	LHS	BT	T-Jn	Chand
16	35809	RHS	BT	T-Jn	Chand
17	36571	LHS	BT	T-Jn	Raini
18	39677	RHS	BT	T-Jn	Chand
19	40048	LHS	BT	T-Jn	Falpur

STANDARD DRAWINGS TYPICAL T- JUNCTION WITH SINGLE LANE BT ROAD (BHADRAK-ANANDPUR-BALANCE WORK)			
DRG NO.	DATE	REV	APPROVED
SH. NO.	19	R-1	EE.PMU
SCALE	NTS		CEG
DESIGNED BY		CEG	
DRAWN BY		CEG	

**PROJECT:-**  
**ODISHA STATE ROAD PROJECT**  
**UNDER WORLD BANK**

**CONSULTING ENGINEER, WB GROUP LTD**  
 E-12, Moji Colony, Malviya Nagar Jaipur-17  
 Tel: +91-141-2520899, 2521899, 2520556  
 Fax: 2521348, e-mail: ceg@ceindia.com





S.No	Drawings	Scale	Type	Type of Junction	Name of Village
1	Proposed	1:500	RT	V-V-B	Asanpur
2	1:500	RT	V-V-B	Asanpur	Asanpur
3	1:500	RT	V-V-B	Asanpur	Asanpur
4	2:500	RT	V-V-B	Asanpur	Asanpur
5	3:500	RT	V-V-B	Asanpur	Asanpur
6	4:500	RT	V-V-B	Asanpur	Asanpur

**STANDARD DRAWINGS**  
**TYPICAL Y-JUNCTION WITH**  
**SINGLE LANE BT ROAD/EARTHEN ROAD**  
**(BHADRAK-ANANDPUR-BALANCE WORK)**

DRG NO.	08/PC/CEG/ND	DESIGNED BY	CEG	CEG	CEG	REV. R1	APPROVED
SH NO.	20	DATE	18/01/13	REV.	R-1	EE.PMU	CE.WBP
SCALE	NTS						

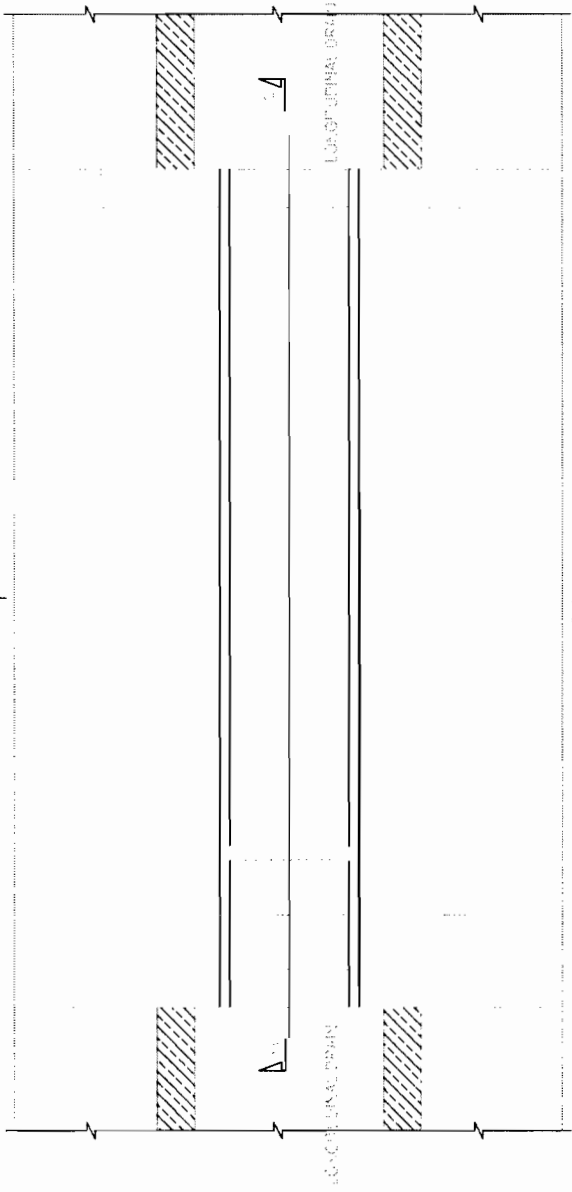
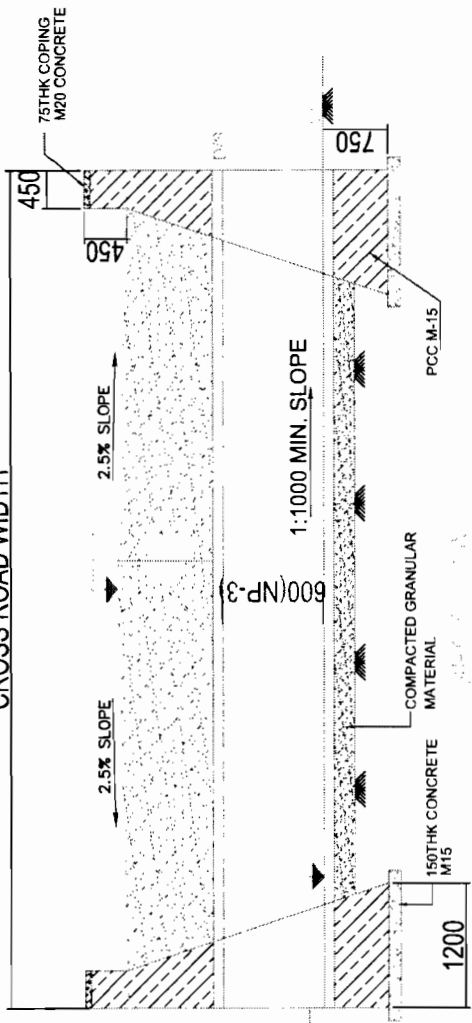
**PROJECT:-**  
**ODISHA STATE ROAD PROJECT**  
**UNDER WORLD BANK**

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**CEG**



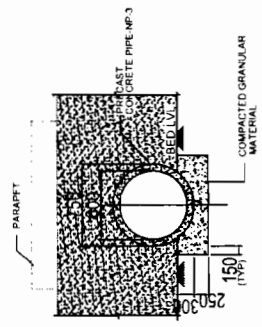
CROSS ROAD WIDTH



DETAILS TO BE SHOWN AT JUNCTIONS

Sl. No.	Change	Type of Junction
1	0+(0/0)	Major-Jn
2	42+400	Major-Jn

SCHEDULE OF MAJOR JUNCTIONS  
 Sl no Change Type of Junction  
 1 0+(0/0) Major-Jn  
 2 42+400 Major-Jn



SECTION B-B

STANDARD DRAWINGS  
 TYPICAL - CROSS DRAIN  
 SINGLE LANE BT ROAD/EARTHEN ROAD  
 (BHADRAK-ANANDPUR-BALANCE WORK)

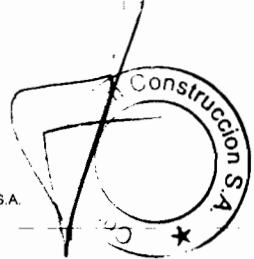
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SH. NO.	21	DATE	18/01/13
SCALE		REV	R-1
		CEG	CEG
		REV	EE, PMU
		APPROVED	CE, WBP

OSR/REG/CEG/IN	DATE	REV	R-1
21	18/01/13	REV	R-1
SCALE		CEG	CEG
		REV	EE, PMU
		APPROVED	CE, WBP

NTS

PROJECT:-  
 ODISHA STATE ROAD PROJECT  
 UNDER WORLD BANK

**CONSULTING ENGINEER, WBP GROUP LTD**  
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Corsan Corviam Construccion S.A.  
 Contractor

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





# SCHEDULE OF ROAD HUMPS

Sl.No.	Description	Chainage	Numbers	Remarks
1	4 Legged Junction	1356	2	Provide on cross road
2		4427	2	..do..
3		18666	2	..do..
4	T-Junction	1795	1	..do..
5		3359	1	..do..
6		3595	1	..do..
7		5984	1	..do..
8		8576	1	..do..
9		8737	1	..do..
10		11798	1	..do..
11		13463	1	..do..
12		14528	1	..do..
13		17018	1	..do..
14		19453	1	..do..
15		24252	1	..do..
16		30339	1	..do..
17		31478	1	..do..
18		33952	1	..do..
19		35809	1	..do..
20		36571	1	..do..
21		39977	1	..do..
22		40048	1	..do..
23		42300	1	..do..
24	Y-Junction	8459	1	..do..
25		10024	1	..do..
26		19402	1	..do..
27		29851	1	..do..
28		31588	1	..do..
29		38543	1	..do..
30		40567	1	..do..
31		42520	1	..do..
32		44625	1	..do..
33	School	17588	1	..do..
34		20246	1	..do..
35		20479	1	..do..
36		33991	1	..do..
37		35489	1	..do..

# SCHEDULE OF PEDESTRIAN CROSSING

Sl.No.	Description	Proposed Chainage	No. of Ped Crossing
1	Bus Bay/Stop	8045.000	1
2		8315.000	1
3		11470.000	1
4		11960.000	1
5		13345.000	1
6		13615.000	1
7		14420.000	1
8		14690.000	1
9		17445.000	1
10		17805.000	1
11		18490.000	1
12		19460.000	1
13		20065.000	1
14		24140.000	1
15		24405.000	1
16		25390.000	1
17		26155.000	1
18		27090.000	1
19		27605.000	1
20		29315.000	1
21		30080.000	1
22		30890.000	1
23		31885.000	1
24		33755.000	1
25		34085.000	1
26		35015.000	1

Sl.No.	Description	Proposed Chainage	No. of Ped Crossing
27	Bus Bay/Stop	35460.000	1
28		35885.000	1
29		39795.000	1
30		40090.000	1
31		40990.000	1
32		41235.000	1
33	School	17588.000	1
34		20245.000	1
35		20364.000	1
36		20479.000	1
37		33991.000	1
38		35165.000	1
39	Hospital	6413.000	1
40		40887.000	1

NOTE:-

1. FOR DETAILS OF PEDESTRIAN CROSSING REFER ROAD MARKINGS
2. FOR DETAILS OF ROPHS AT PEDESTRIAN CROSSING REFER STANDARD DRAWINGS

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 Fax: 2521348, e-mail: [ceg@ceindia.com](mailto:ceg@ceindia.com)

**PROJECT:-**  
 ODISHA STATE ROAD PROJECT  
 UNDER WORLD BANK ASSISTANCE.

**SCHEDULE OF ROAD HUMPS AND PEDESTRIAN CROSSING**  
 BHADRAK TO ANANDPUR - BALANCE WORK(SH-53, KM 0/00 TO 43/00)  
 DRG NO. CSEP/CEG/SH-53/SCH/RA/PC DESIGNED BY DRAWN BY REV/RT APPROVED  
 SH. NO. 57 DATE 01.13 REV R1 CEG CEG EE, PMU CE, WBP  
 SCALE NTS



CLASS-B, GI 40 MM DIA PIPE

GI 30 MM DIA PIPE

BASE PLATE 150MM

ELEVATION OF FOOTPATH BARRIER

SCHEDULE OF FOOTPATH BARRIERS

Sl.No.	Village Name	Proposed Chainage		Side
		From	To	
1	Randia	3300	3525	Both
2	Barapada	3650	3900	Both
3	Ganjianga	8375	8800	Both
4	Bonth	11600	11900	Both
5	Basanthiya	19275	20650	Both
6	Mareigaon	25550	26100	Both
7	Hatadhi	27150	27500	Both
8		28800	29240	Both
9	Chhenapadi	29650	30000	Both
10	Ambagadia	31025	31700	Both
11	Fakirpur & Anandpur	35075	35400	Both
12		40400	42300	Both

PROJECT:-

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK

**CONSULTING ENGINEER, WBPROUP LTD.**  
E-12, Moji Colony, Malviya Nagar, Jaipur-17

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Fax: 2521348, e-mail: ceg@cegingdia.com

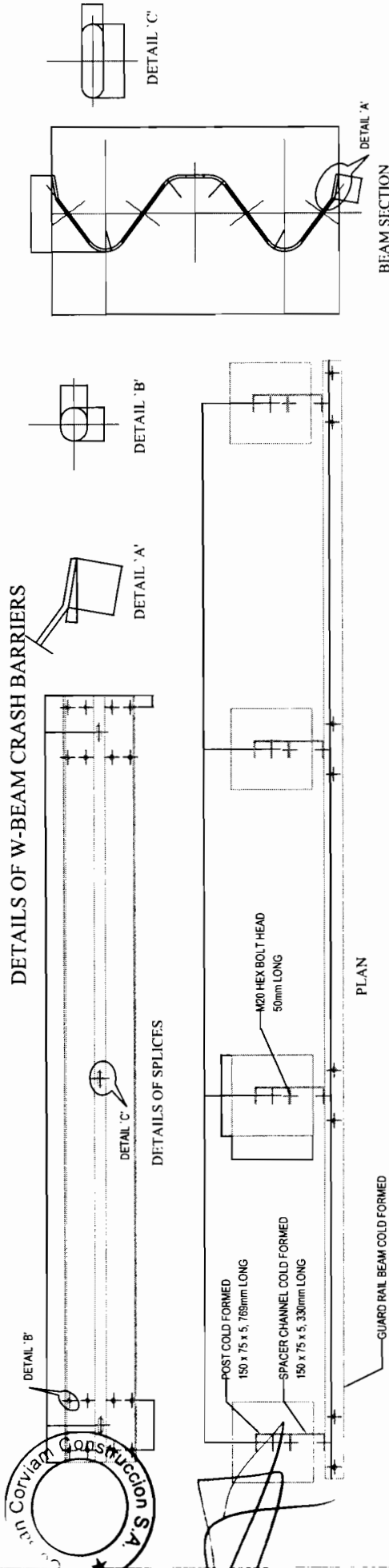


NOTE: Leave openings for entrances to properties and spur roads

STANDARD DRAWINGS  
DETAILS OF FOOTPATH BARRIERS  
(BHADRAK-ANANDPUR-BALANCE WORK)

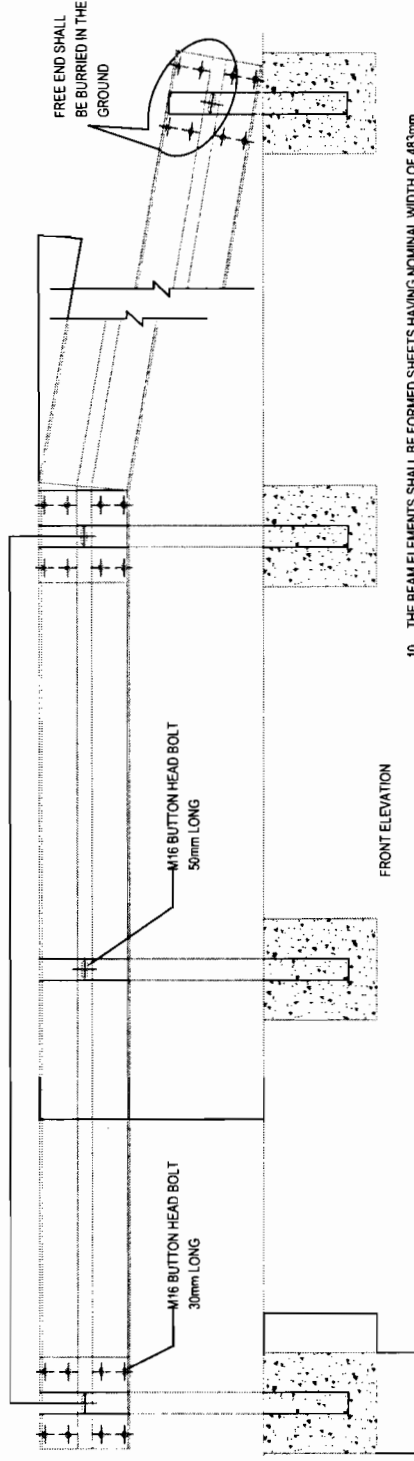
DRG NO.	DATE	REV	NTS	DESIGNED BY	APPROVED
SH. NO.	23	18/01/13	R-1	CEG	EE, PMU
SCALE				CEG	CE, WBP

**DETAILS OF W-BEAM CRASH BARRIERS**



**PLAN**

**BEAM SECTION**



**FRONT ELEVATION**

**SIDE ELEVATION**

1. HEIGHT OF POSTS SHOULD BE 785mm LONG ABOVE THE FINISHED ROAD LEVEL.
2. SPACING OF POSTS SHOULD BE 2.0m C/C.
3. 1 No. SPACER CHANNEL SHOULD BE PLACED AT EACH POST.
4. W-PROFILE FORMED CORRUGATED BEAMS EFFECTIVE LENGTH OF 4318mm, 311mm x 83mm.
5. POST CONSISTS OF FORMED CHANNEL OF SIZE 150 x 75 x 5, 785mm LONG ABOVE GROUND LVL.
6. SPACER CONSISTS OF FORMED CHANNEL OF SIZE 150 x 75 x 5, 330mm LONG.
7. BUTTON HEAD BOLTS M16 x 30mm LONG, 8 Nos FOR THE SPLICING OF THE W PROFILE AT EACH LOCATION.
8. BUTTON HEAD BOLTS M16 x 50mm LONG, 1 Nos AT THE CONNECTION OF THE W BEAM TO SPACER.
9. HEX HEAD BOLTS M20 x 50mm LONG, 2 Nos AT THE CONNECTION OF THE SPACER TO POST.

10. THE BEAM ELEMENTS SHALL BE FORMED SHEETS HAVING NOMINAL WIDTH OF 483mm.
11. THE BASE MATERIAL OF THE CORRUGATED BEAM SHALL COMPLY TO FOLLOWING MECHANICAL PROPERTIES:
  - I. TENSILE STRENGTH MIN=483 MPA.
  - II. ELONGATION IN 2 inches, MIN = 12%.
  - III. YIELD, MIN=345 MPA.
12. ALL MEMBERS OF THE SYSTEM SHOULD BE HOT DIPPED GALVANIZED AND TO HAVE A MINIMUM COATING OF 950g/sq m. EACH FACE IN CONFORMANCE TO M.O.R.T & H. SPECIFICATIONS (CLAUSE 810).
13. BEAMS TO BE ERRECTED ON A RADIUS OF 46m (150') OR LESS SHALL BE SHAPE CURVED TO APPROPRIATE CURVATURE.
14. CRASH BARRIERS ARE POSTED ON ALL SECTION OF EMBANKMENT WHOSE HEIGHT IS >= TO 3m. HORIZONTAL CURVES OF RADIUS < 170m AND ALSO AT ALL BRIDGE APPROACHES FOR LENGTH OF 20m ON BOTH SIDES.
15. BEAM SURFACE FACING THE TRAFFIC IS PAINTED WITH ALTERNATE BANDS (500mm WIDE) OF BLACK & YELLOW COLOR REFLECTORISED PAINT CONFORMING CL.803.5 OF M.O.R.T & H SPEC.

**SCHEDULE :**  
AT 6 MINOR BRIDGES : 80M AT 2 SIDES ON BOTH WAYS

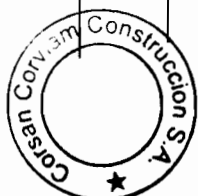
**PROJECT:-**

**ODISHA STATE ROAD PROJECT**  
**UNDER WORLD BANK**

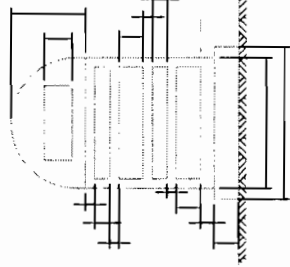
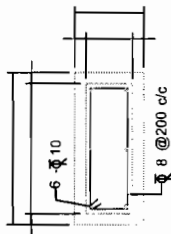
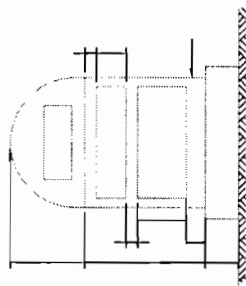
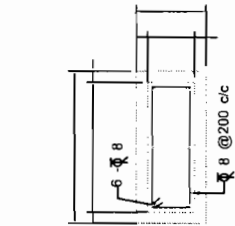
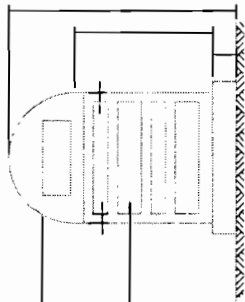
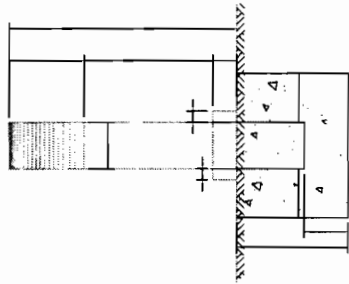
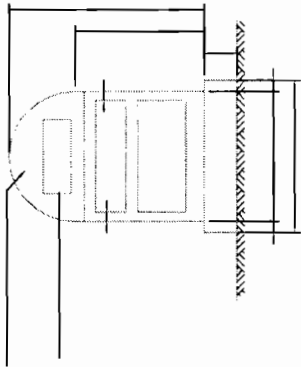
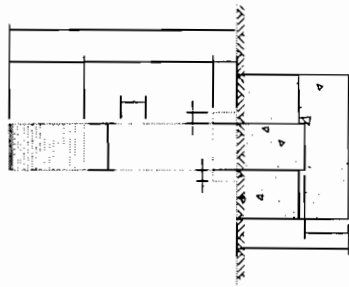
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**STANDARD DRAWINGS**  
**METAL BEAM CRASH BARRIER DETAILS**  
**(BHADRAK-ANANDPUR-BALANCE WORK)**

DRG NO.	DATE	REV	R-1	DESIGNED BY	DRAWN BY	REV. BY	APPROVED
CEG/VE/CEC	24	18/01/13	R-1	CEG	CEG	EE/PMU	CE/WBP
SH. NO.				SCALE			
				NTS			



Corsan Corviam Construction S.A.  
Contractor



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 REFERED.
4. LETTERING IS DONE WITH APPROVED QUALITY BLACK ENAMEL PAINT USING STENCIL

PROJECT:-

**ODISHA STATE ROAD PROJECT**  
**UNDER WORLD BANK**

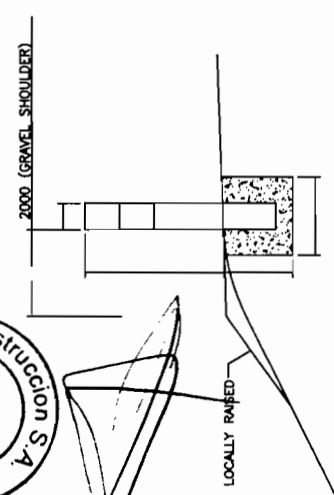
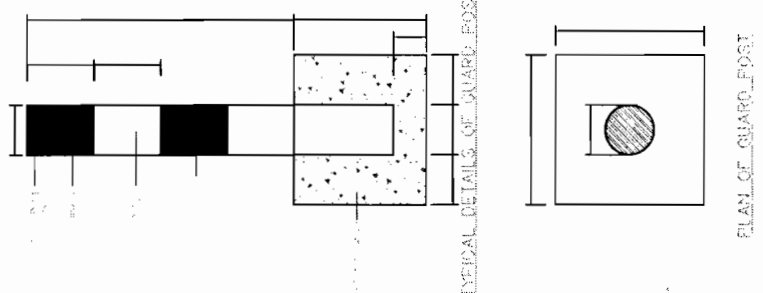
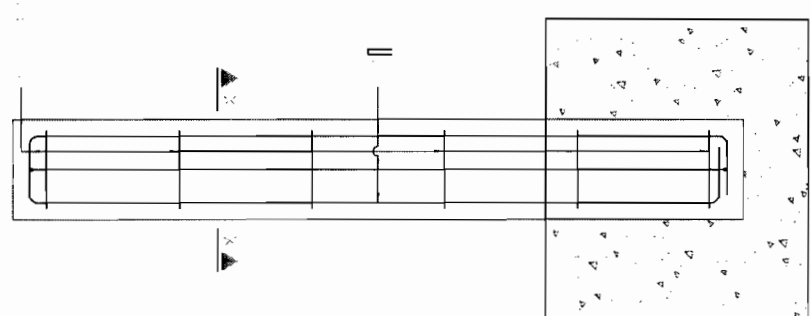
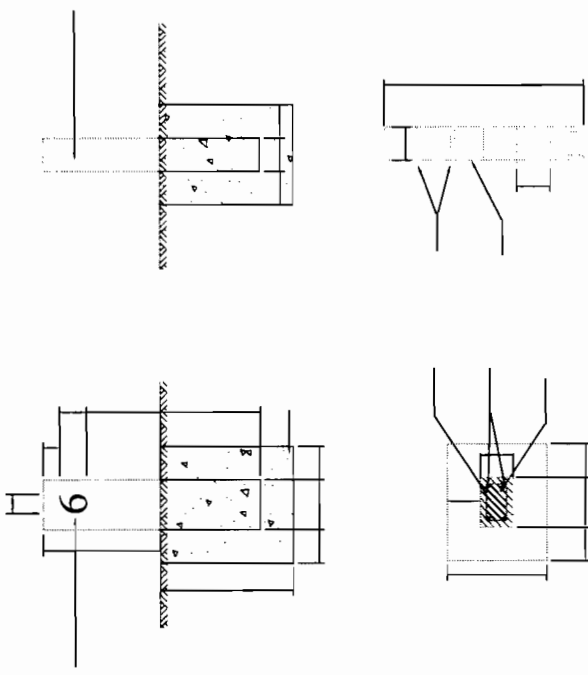
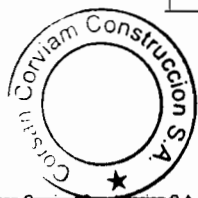
**CONSULTING ENGINEER, WBPROUP LTD**  
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Tel: +91-141-2520899, 2521899, 2520556  
Fax: 2521348, e-mail: ceg@cegindia.com



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

STANDARD DRAWINGS  
TYPICAL KM STONE & 5TH KM STONE  
(BHADRAK-ANANDPUR-BALANCE WORK)

DRG NO.	OSR/PC/CD/M/01	DESIGNED BY	CEG	DRAWN BY	CEG	REV. IT	APPROVED
SH. NO.	25	DATE	19/01/13	REV	R-1	EE(PMU)	CE.WBP
SCALE			NTS				



FIXING DETAILS OF GUARD POST

DETAILS OF GUARD POST

PLAN OF GUARD POST

REINFORCEMENT DETAIL OF GUARD POST

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.

3. FOR SCHEDULE REFER DRAWING NO. OSRP/CEG/SH9A&SH-9/SCH-GP

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

DRG NO.		OSRP/CEG/SH9A & GP		DESIGNED BY	CEG	DRAWN BY	CEG	REV/RT	EE, PMU	APPROVED	CE, WBP
SH. NO.	26	DATE	18/01/13	REV	R-1						
SCALE	NTS										

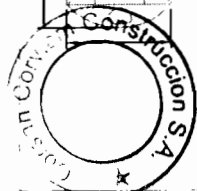
STANDARD DRAWINGS  
TYPICAL DETAILS OF 200M STONE & GUARD POST  
(BHADRAK-ANANDPUR-BALANCE WORK)

PROJECT:-  
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK

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Corsan Corviam Construccion S.A.  
Contractor

*[Handwritten signature]*

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

*[Handwritten signature]*



**CONSULTING ENGINEERS, WB GROUP LTD**  
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Tel: +91-141-2520899, 2521899, 2520556  
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PROJECT:-

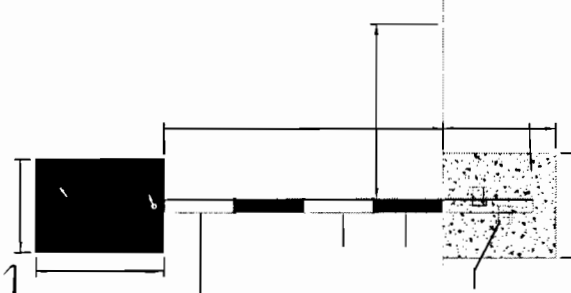
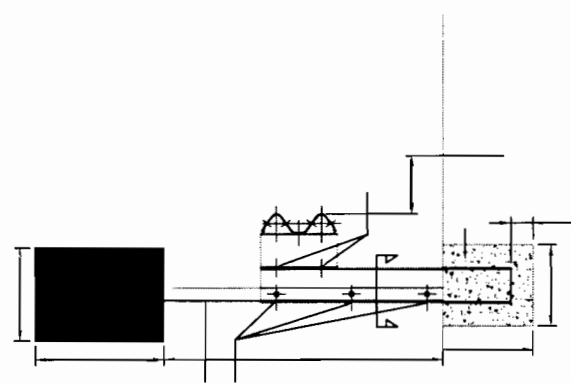
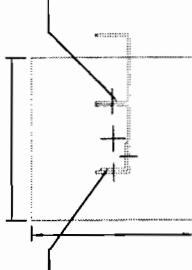
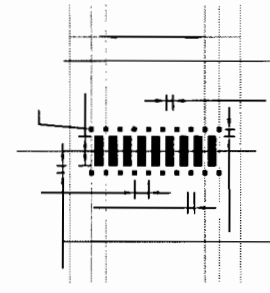
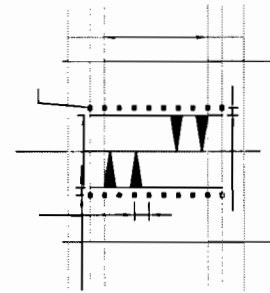
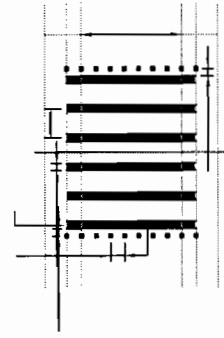
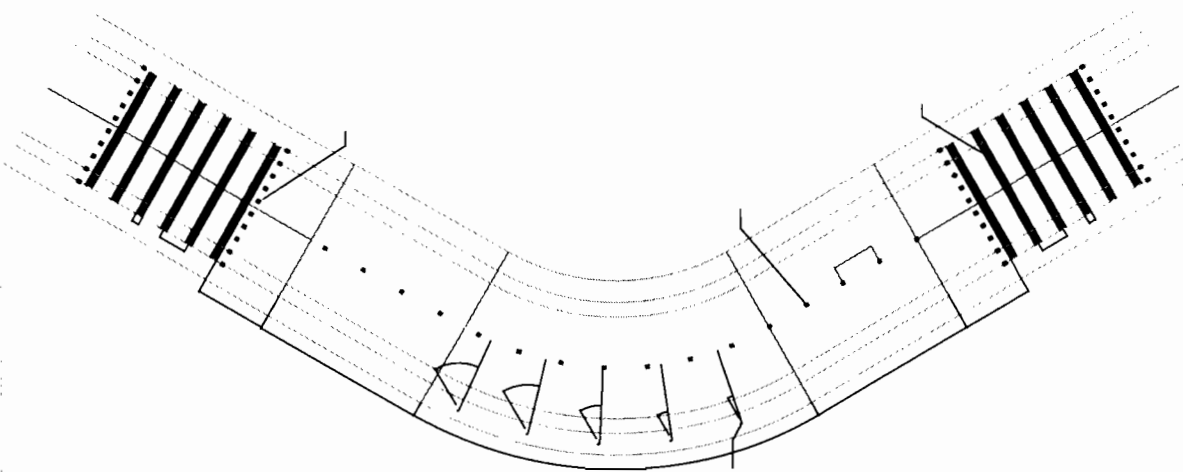
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK

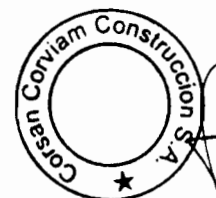
NOTE: Follow Drawing No. OSRP/CEG/SH-53/SCH/RRPM

STANDARD DRAWINGS

DETAILS OF RRPMS & CHEVRON MARKERS  
(BHADRAK-ANANDPUR-BALANCE WORK)

DRG NO. OSRP/CEG/RRPM	DESIGNED BY	DRAWN BY	REVISED BY	APPROVED
SH. NO. 28	DATE 18/01/13	REV R-1	CEG	EE, PMU
SCALE	NTS			CE, WBP



Corsan Conviem Construction S.A.  
Contractor

SCHEDULE OF ROAD HUMPS

Sl.No.	Description	Chainage	Numbers	Remarks
1	4 Legged Junction	1356	2	Provide on cross road
2		4427	2	.db.
3		18666	2	.db.
4	T-junction	1795	1	.db.
5		3359	1	.db.
6		3995	1	.db.
7		5884	1	.db.
8		8576	1	.db.
9		8737	1	.db.
10		11796	1	.db.
11		13483	1	.db.
12		14528	1	.db.
13		17018	1	.db.
14		19453	1	.db.
15		24252	1	.db.
16		30339	1	.db.
17		31478	1	.db.
18		33952	1	.db.
19		35809	1	.db.
20		36571	1	.db.
21		39877	1	.db.
22		40046	1	.db.
23		42300	1	.db.
24	Y-junction	8459	1	.db.
25		10924	1	.db.
26		19402	1	.db.
27		20851	1	.db.
28		31596	1	.db.
29		38543	1	.db.
30		40567	1	.db.
31		42320	1	.db.
32		44626	1	.db.
33	School	17586	1	.db.
34		20246	1	.db.
35		20479	1	.db.
36		33991	1	.db.
37		35488	1	.db.

SCHEDULE OF BUILTUP AREA

Sl.No.	Village Name	Proposed From	To	Distance
1	BAGURAI	1800	2670	870
2	RANDIA	3330	4230	900
3	BARAPADA	7600	8650	1250
4	GANJANGA	11600	11900	300
5	PALASA	13320	13850	530
6	TILLO	16670	17100	430
7	BONTH	17520	20700	3180
8	ORAL CHHAKA	24000	24330	330
9	BASANTIA	25450	26100	650
10	MAREGAON	27100	27950	850
11	HATAJHI	27950	30500	2550
12	CHHENAPADI	30920	37400	1480
13	CHORAGADIA	32750	33100	350
14	BANCHO Jn	33650	34100	450
15	AMBAGADIA	35050	35500	450
16	CHALAVANTHI	39900	40100	200
17	FAKIRPUR&ANANDPUR	40400	42300	1900

SCHEDULE OF MAJOR JUNCTIONS

Sl no	Chainage	Type of Junction
1	0+000	Major-Jn
1	42+400	Major-Jn

SCHEDULE OF ROAD CURVES UP TO 300m

Sl.No.	Curve Chainage	Start	End	Radius
1		2126.72	2327.634	240
2		2447.634	2677.044	200
3		2867.129	2933.781	600
4		3271.818	3438.818	300
5		3461.037	3677.961	240
6		3986.602	4293.748	240
7		4326.578	4597.867	240
8		4976.798	5071.852	170
9		5011.852	5061.212	170
10		5018.212	5038.278	170
11		5072.278	5046.267	170
12		5018.200	5073.176	170
13		5073.176	5073.176	300
14		5073.176	5073.176	300
15		5073.176	5073.176	170
16		5073.176	5073.176	300
17		5073.176	5073.176	170
18		5073.176	5073.176	170
19		5073.176	5073.176	170
20		5073.176	5073.176	170
21		5073.176	5073.176	300

PROJECT:-

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE.

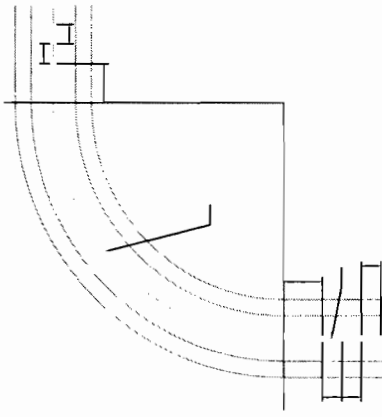
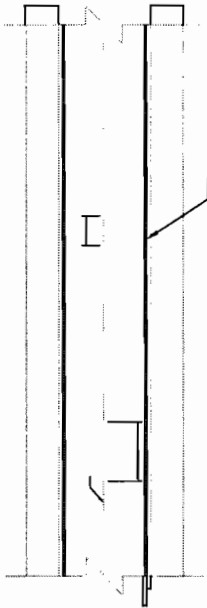
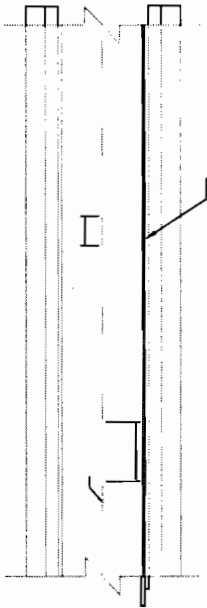
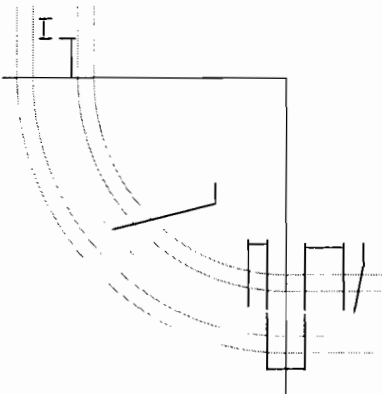
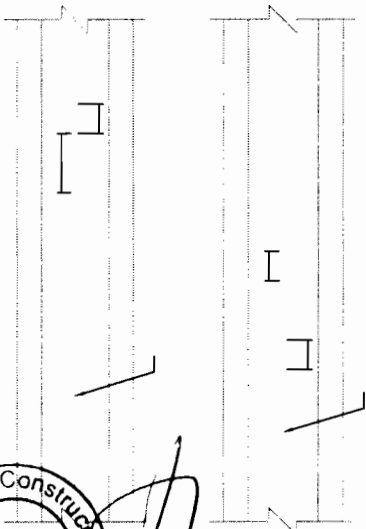
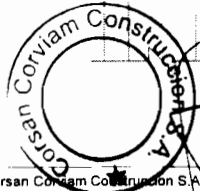
SCHEDULE OF RRPMS

BHADRAK TO ANANDPUR - BALANCE WORK(SH-53, KM 0/00 TO 43/00)			
DRG NO.	DATE	DESIGNED BY	APPROVED
SH. NO.	DATE	REV	REV
SCALE	NTS	CEG	CEG
		CEG	EE, PMU
			CE, WBP

**CONSULTING ENGINEER, WBP GROUP LTD.**  
E-12, Maj Colony, Malviya Nagar, Jaipur-17  
Tel: +91-141-2520889, 2521889, 2520556  
Fax: 2521348, e-mail: ceg@engindia.com

Chief Engineer  
World Bank Projects, Odisha  
Bhubaneswar  
O/o the E.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. ROAD MARKING SHOULD BE DONE WITH THERMOPLASTIC PAINT CONFORMING TO CL. 803.4 OF M.O.R.T. & H SPECIFICATIONS
4. DETAILS OF ROAD MARKING ARE AS PER IRC: 35-1987 CODE OF PRACTICE FOR ROAD MARKINGS

**PROJECT:-**  
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK

**CONSULTING ENGINEER, WB GROUP LTD**  
E-12, Moji Colony, Malviya Nagar Jaipur-17  
Tel: +91-141-2520899, 2521899, 2520556  
Fax: 2521348, e-mail: ceg@cegindia.com

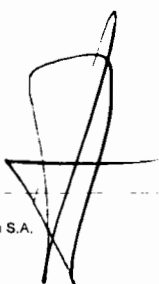


**STANDARD DRAWINGS  
TYPICAL ROAD MARKING DETAILS  
(SHEET 1 OF 2)**

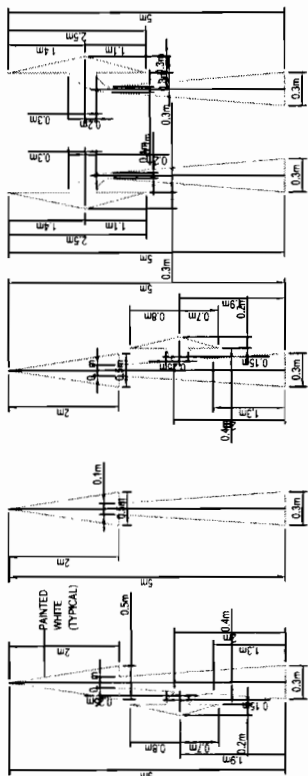
DRG NO.	DATE	DESIGNED BY	REV #1	APPROVED
SH. NO.	29	CEG	EE/PMU	CE/WBP
SCALE	18/07/13	CEG	NTS	



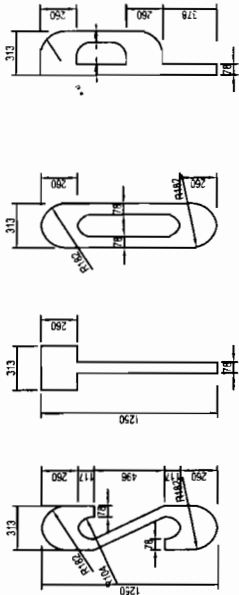
Corsan Corviam Construcción S.A.  
Contractor



**DIRECTIONAL ARROWS**



**SIZE OF LETTERS**



**DIAGONAL MARKINGS**

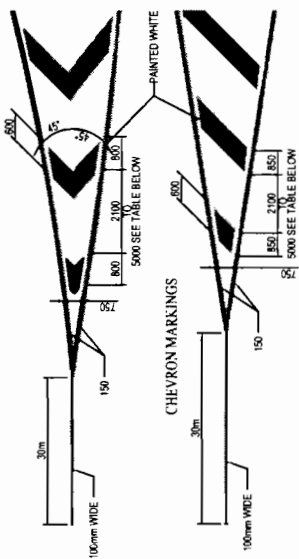
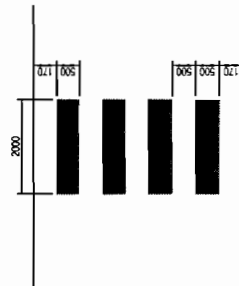


TABLE - SPACING BETWEEN DIAGONALS OR CHEVRONS

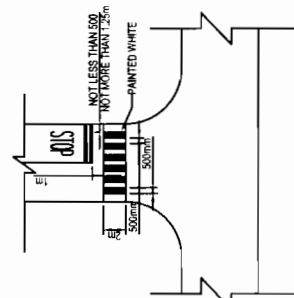
TOTAL LENGTH OF MARKING (m)	SPEED (km/h)	SPEED (75 km/h)
< 6	2100	-
6 TO 22	3000	-
> 22	4000	-
> 40	-	6000

**SCHEDULE OF MAJOR JUNCTIONS**

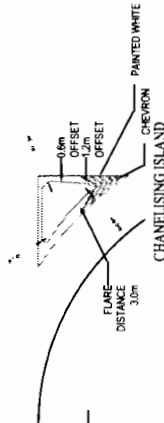
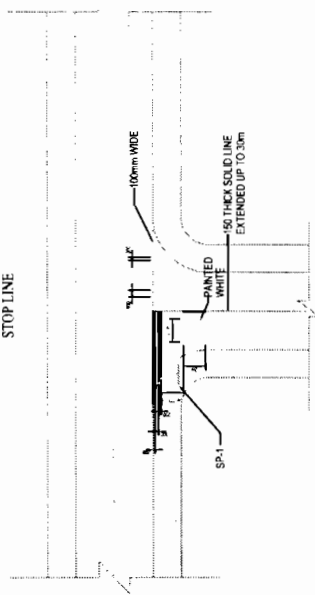


PEDESTRIAN CR SSI

**PEDESTRIAN CROSSING**



**STOP LINE**



**NOTE:**

1. ALL LENGTHS AND SPACINGS IN THE TABLE ARE MEASURED PARALLEL TO ROAD CENTRE LINE.
2. FIRST DIAGONAL OR CHEVRON IS TO BE LOCATED AT ITS LENGTH IS AT LEAST EQUAL TO ITS WIDTH
3. WIDTH OF ALL DIAGONALS/CHEVRONS MEASURED AT RIGHT ANGLES TO THE DIAGONALS OR CHEVRONS IS 600mm.
4. FOR CENTERLINE AND EDGE LINE MARKING AT BUS BAY LOCATION REFER DRAWING NO. OSRP/CEG/01
5. ROAD MARKING SHOULD BE DONE WITH THERMOPLASTIC PAINT CONFORMING TO CL. 8014 OF M.O.R.T. & H SPECIFICATIONS
6. DETAILS OF MARKING AT INTERSECTIONS ARE AS PER M.O.R.T. & H TYPE DESIGNS FOR INTERSECTIONS ON NATIONAL HIGHWAYS

FOR SCHEDULE OF PEDESTRIAN XING REFER DRAWING NO: OSRP/CEG/SCH-P.Xing

**PROJECT:-**

**ODISHA STATE ROAD PROJECT**  
**UNDER WORLD BANK**

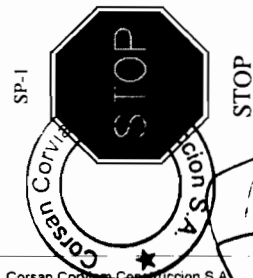
**CONSULTING ENGINEER, WB GROUP LTD**  
E-12, Moji Colony, Malviya Nagar, Jaipur-17  
Tel: +91-141-2520899, 2521899, 2520556  
Fax: 2521348, e-mail: ceg@cegingdia.com



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

**STANDARD DRAWINGS**  
**TYPICAL ROAD MARKING & CHEVRON MARKING DETAILS**  
**(SHEET 2 OF 2)**

DRG NO. OSRP/CEG/SCH-P.XING/02	DESIGNED BY	CEG	DRAWN BY	CEG	REV	R-1	APPROVED	CE/WRP	
SH. NO. 30	DATE	18/01/13	REV						
SCALE	NTS								



SP-1

STOP



SP-2

COMPULSORY  
KEEP LEFT



SP-2(a)

RESTRICTION ENDS



SP-3

GIVE WAY



SP-4(a)

SPEED LIMIT



SP-4(b)

SPEED LIMIT

SP-4(c)



SPEED LIMIT

SP-4(d)



SPEED LIMIT

SP-4(e)



SPEED LIMIT

SP-5(a)



OVERTAKING  
PROHIBITED

SP-5(b)



ONE WAY

SP-5(c)



ONE WAY

SP-6



SCHOOL ZONE

SP-7



COMPULSORY  
SOUND HORN

SP-9(a)



RIGHT SIDE ROAD

SP-9(b)



LEFT SIDE ROAD

SP-10(a)



RIGHT HAND  
CURVE

SP-10(b)



LEFT HAND  
CURVE

SP-10(c)



RIGHT HAIR PIN  
BEND

SP-10(d)



LEFT HAIR PIN  
BEND

SP-10(e)



RIGHT REVERSE  
BEND

SP-10(f)



LEFT REVERSE  
BEND

SP-11



T-INTERSECTION

SP-12



PEDESTRIAN  
CROSSING

PROJECT:-

**CONSULTING  
ENGINEER, WB GROUP LTD**  
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Fax: 2521348, e-mail: ceg@ceindia.com

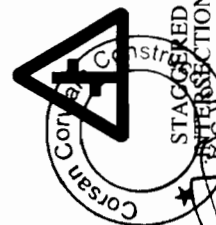


STANDARD DRAWINGS

TYPICAL ROAD SIGNS (SHEET 1 OF 4)

DRG NO.	OSR/PC/GR/01	DESIGNED BY	CEG	APPROVED	CE, WBP
SH. NO.	31	DATE	18/01/13	REV	EE, PMU
SCALE	NTS		REV	CEG	CE, WBP

SP-13(a)



STAGGERED INTERSECTION

SP-14(c)



Y-INTERSECTION

SP-13(C)



MAJOR ROAD AHEAD

SP-14(e)



OVERHEAD CABLE

SP-13(d)



MAJOR ROAD AHEAD

SP-15(a)



NARROW BRIDGE

SP-14(a)



Y-INTERSECTION

SP-15(b)



DUAL C' WAY STARTS

SP-14(b)



Y-INTERSECTION

SP-15(c)



DUAL C' WAY ENDS

SP-15(d)



SERIES OF BENDS

SP-16(a)



HUMP OR ROUGH ROAD

SP-16(b)



BARRIER AHEAD

SP-24



PUBLIC TELEPHONE

SP-22



PETROL BUNK

SP-23



HOSPITAL

SP-26



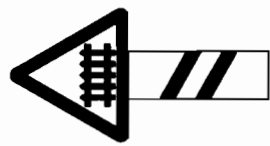
EATING PLACE

SP-25



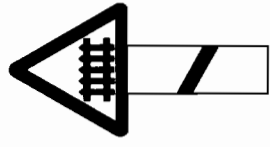
DISPENSARY

SP-18 (a)



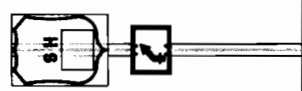
GUARDED RAILWAY CROSSING AT 200m

SP-18 (b)



GUARDED RAILWAY CROSSING AT 50-100m

SP-17



STATE ROUTE MARKER SIGN

LEGEND

- WHITE SHEET
- BLACK SHEET
- RED SHEET
- BLUE SHEET

1. DETAILS OF ROAD MARKINGS SHALL BE AS PER CHAPTER 7 OF THE MANUAL OF ROAD MARKINGS, 1987.
  2. THE ROAD MARKINGS SHALL BE AS PER CHAPTER 7 OF THE MANUAL OF ROAD MARKINGS, 1987.
  3. ALL MARKINGS AND CAUTIONARY SIGNS SHALL BE AS PER CHAPTER 7 OF THE MANUAL OF ROAD MARKINGS, 1987.
  4. ALL MARKINGS AND CAUTIONARY SIGNS SHALL BE AS PER CHAPTER 7 OF THE MANUAL OF ROAD MARKINGS, 1987.
- REVISIONS TO BE MADE AS PER CHAPTER 7 OF THE MANUAL OF ROAD MARKINGS, 1987.

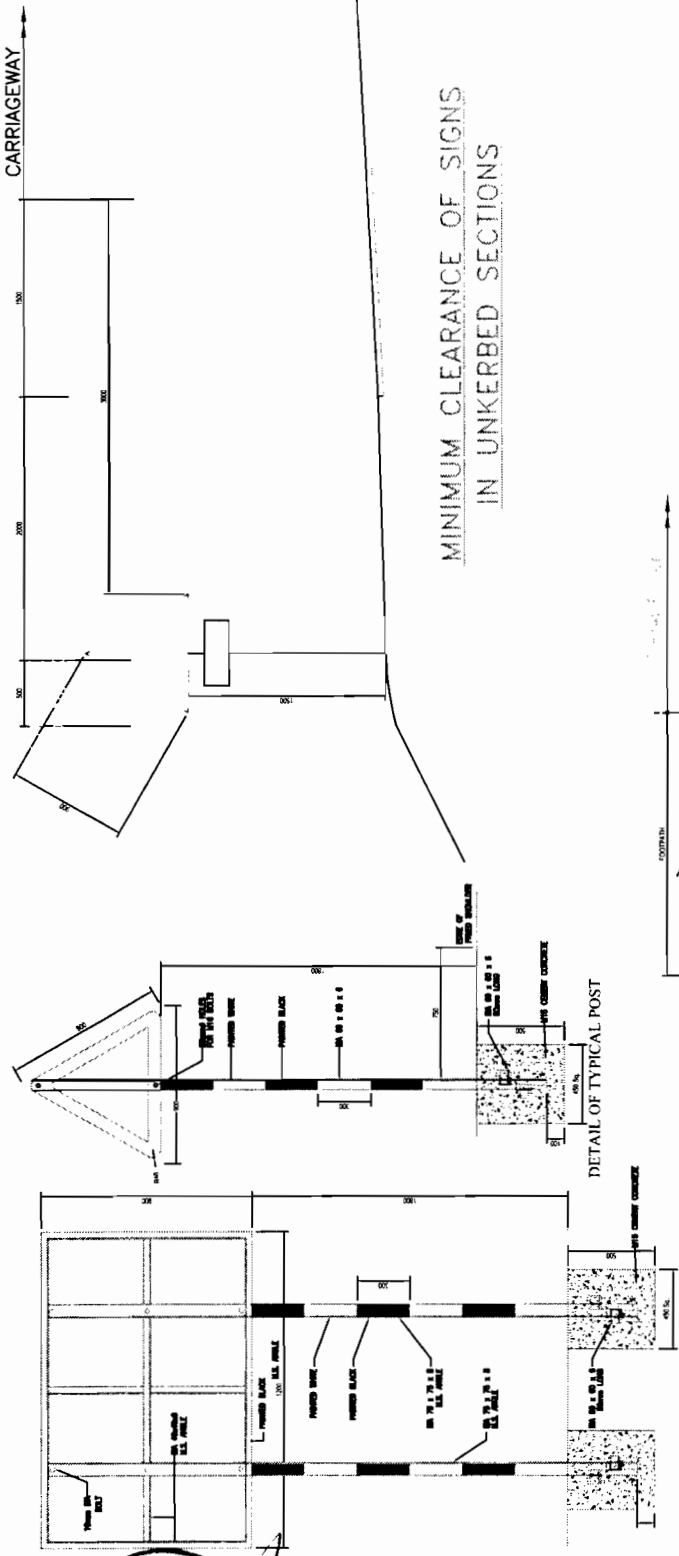
**STANDARD DRAWINGS**  
**TYPICAL ROAD SIGNS (SHEET 2 OF 4)**

DRG NO.	CORP/CEG/MBZ	DESIGNED BY	DRAWN BY	REV/RT	APPROVED
SH. NO.	32	DATE	18/01/13	REV	R-1
SCALE	NTS		CEG	CEG	EE, PMU CE, WBP

**PROJECT:-**  
**ODISHA STATE ROAD PROJECT**  
**UNDER WORLD BANK**

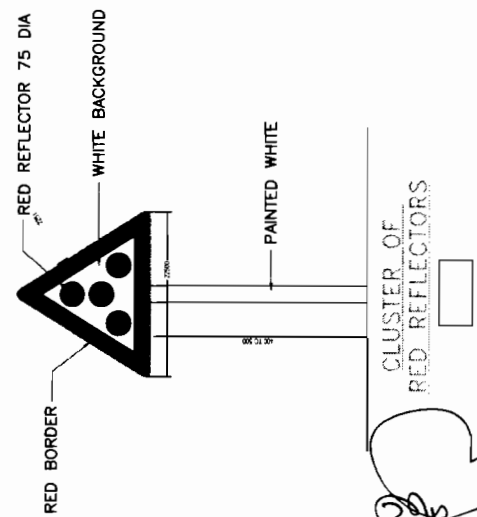
**CONSULTING ENGINEER, WBPROUP LTD**  
E-12, Moji Colony, Malviya Nagar, Jaipur-17  
Tel: +91-141-2520899, 2521899, 2520556  
Fax: 2521348, e-mail: ceg@cegindia.com

**CEG**



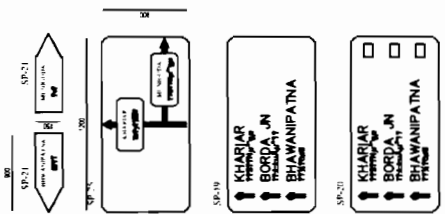
MINIMUM CLEARANCE OF SIGNS  
IN UNKERBED SECTIONS

MINIMUM CLEARANCE OF SIGNS  
IN KERBED SECTIONS



**NOTES**

1. ALL DIMENSIONS ARE IN mm UNLESS INDICATED OTHERWISE
2. ROAD SIGNS, SIZES OF ARROWS, LETTERS & NUMERALS IS AS PER IRC:87-2001.
3. ALL ROAD SIGNS ARE NORMALLY BE PLACED AT RIGHT ANGLES TO THE LINE OF TRAVEL OF THE APPROACHING TRAFFIC.
4. ALL WARNING SIGNS ARE NORMALLY BE LOCATED AT 120m IN ADVANCE OF THE HAZARD MARKED AGAINST IN NON-URBAN LOCATIONS. IN URBAN LOCATIONS, THE WARNING SIGNS ARE LOCATED AT ABOUT 50m AWAY FROM THE POINT OF HAZARD.
5. ALL ROAD SIGNS ARE RETRO-REFLECTIVE SHEET OF HIGH INTENSITY GRADE WITH ENCAPSULATED LENSE FRIED OVER ALUMINIUM SHEET AS PER MORTH SPECIFICATIONS.
6. ROUTE MARKER SIGN FOR NH IS AS PER IRC :2-1968.
7. SIGNS WITH AN AREA UPTO 0.9sq. m. SHALL BE MOUNTED ON A SINGLE POST, AND FOR GREATER AREA TWO OR MORE SUPPORTS SHALL BE PROVIDED.
8. POST ANGLES USED TO SUPPORT THE SIGN BOARD SHALL BE PAINTED WITH (2-COATS) APPROVED QUALITY (ANTI-CORROSIVE) ENAMEL PAINT OVER TWO COATS OF GOOD QUALITY PRIMER

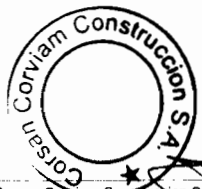


**PROJECT:-**  
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK

**CONSULTING ENGINEER, WB GROUP LTD**  
E-12, Moji Colony, Malviya Nagar, Jaipur-17  
Tel: +91-141-2520899, 2521899, 2520556  
Fax: 2521348, e-mail: ceg@cegindia.com

DRG NO.	DATE	REV	REV	DATE	DATE	DATE	DATE
SH. NO.	33	16/01/13	R-1	CEG	CEG	EE/PMU	APPROVED
SCALE	NTS						

STANDARD DRAWINGS  
TYPICAL ROAD SIGNS (SHEET 3 OF 4)



Corsan Corviam Construccion S.A.  
Contractor

Chief Engineer  
World Bank Projects Odisha  
World Bank Project  
To 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



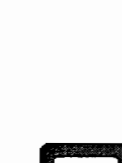
SP-48



SP-49



SP-50



SP-51

1. DESIGN OF SIGNAGE SHALL BE AS PER ISIRI CODES.
2. DESIGN SHALL BE APPROVED BY THE EMPLOYER.
3. ALL MATERIALS AND WORKMANSHIP SHALL BE AS PER ISIRI CODES.
4. ALL MATERIALS AND WORKMANSHIP SHALL BE AS PER ISIRI CODES.
5. ALL MATERIALS AND WORKMANSHIP SHALL BE AS PER ISIRI CODES.

STANDARD DRAWINGS  
TYPICAL ROAD SIGNS (SHEET 4 OF 4)

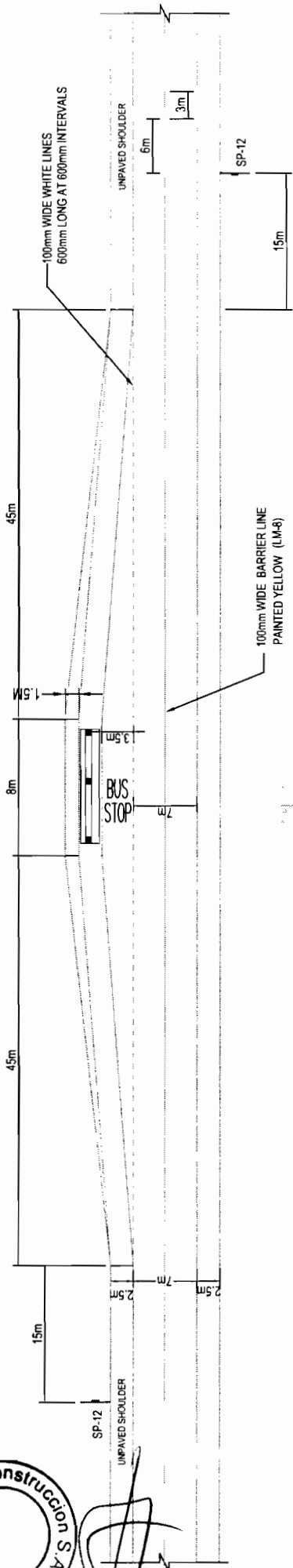
PROJECT:-  
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK

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E-12, Moji Colony, Malviya Nagar Jaipur-17  
Tel: +91-141-2520899, 2521899, 2520556  
Fax: 2521348, e-mail: ceg@ceginia.com



DRG NO.	DSR/CEG/08/04	DESIGNED BY	CEG	DRAWN BY	CEG	REV/RI	EE/PMU	APPROVED	CE/WBP
SH. NO.	34	DATE	18/01/13	REV	R-1				
SCALE	NTS								

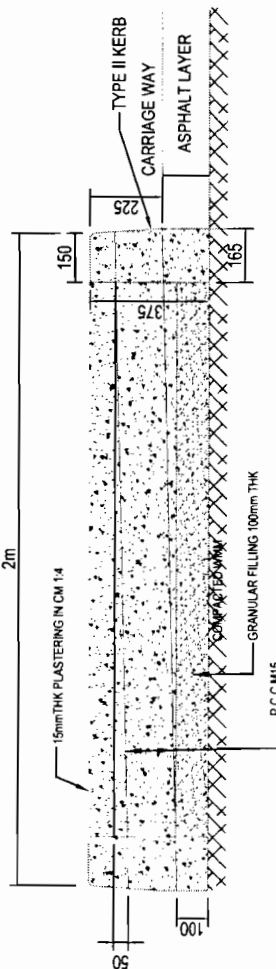
90 BAY DETAILS



90 BAY DETAILS

**NOTE:**

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED
2. PAVEMENT LAYERS OF CARRIAGEWAY SHALL BE EXTENDED IN THE BUS BAY AREA. AS PER THE CONTINUING T.O.S.
3. REFER IRC-35 FOR BUS STOP DRAWING AND DETAILS



**TYPICAL BUS BAY SHEET - 1**

(BHADRAK-ANANDPUR-BALANCE WORK)

DRG NO.	CEMP/CEG/801	DESIGNED BY	CEG	DRAWN BY	CEG	APPROVED
SH. NO.	35	DATE	19/01/13	REV	R-1	REV. BY
SCALE			NTS			EE, PMU CE, WBP

**PROJECT:-**

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK

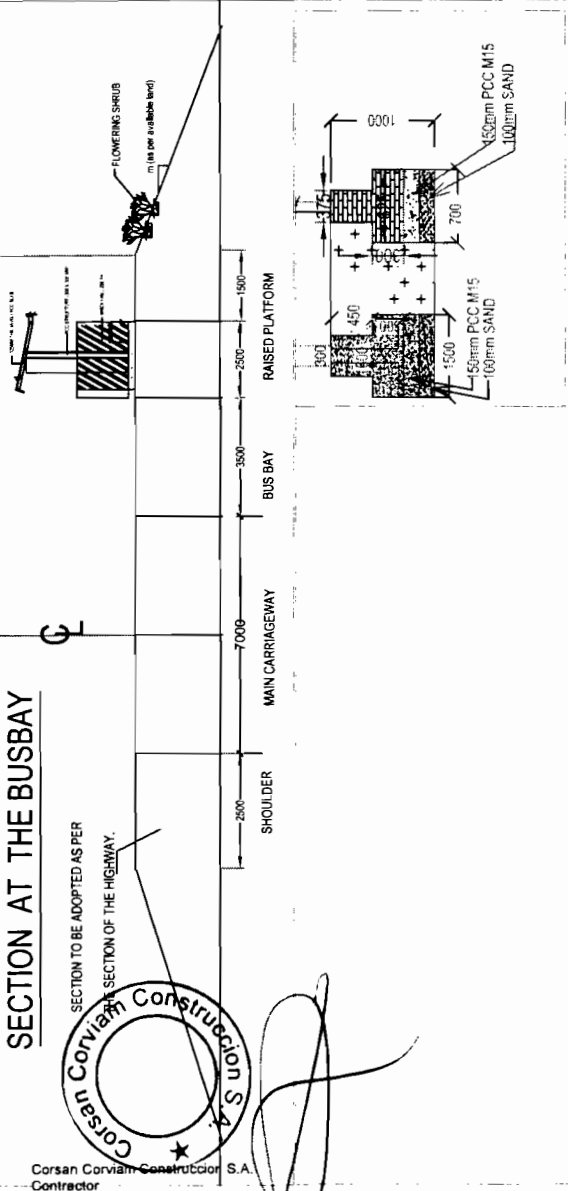
**CONSULTING ENGINEER, WB GROUP LTD**

E-12, Moji Colony, Malviya Nagar Jaipur-17  
Tel: +91-141-2520899, 2521899, 2520556  
Fax: 2521348, e-mail: ceg@cegindia.com



Corviam Construction S.A.  
Contractor

**SECTION AT THE BUSBAY**



Corsan Corviam Constructor S.A. Contractor

**SCHEDULE OF BUS BAYS**

SI.No.	Name of Village	Down (Right)	Type
1	Barapada	8255	1
2	Ganjanaga	11900	1
3	Palasa**	13555	1
4	Brahmapur	14630	1
5	Tillo	17720	1
6	Bonth	19400	1
7	Oral Chhaka**	24345	1
8	Basanthiya	26095	1
9	Maregaon	27545	1
10	Haladhi	30025	1
11	Chhenapadi	31825	1
12	Bancho Jn**	33695	1
13	Ambagadia	35400	1
14	Taratara Chhaka Jn	35825	1
15	Chalavanthi Jn	40020	1
16	Fakipur	41175	1
17	Anandpur	42345	1

**SCHEDULE OF BUS BAYS**

SI.No.	Name of Village	Up (Left)	Type
1	Barapada	8000	1
2	Ganjanaga	11425	1
3	Palasa**	13300	1
4	Brahmapur	14375	1
5	Tillo	17400	1
6	Bonth	18445	1
7	Oral Chhaka**	24095	1
8	Basanthiya	25450	1
9	Maregaon	27045	1
10	Haladhi	29270	1
11	Chhenapadi	30845	1
12	Bancho Jn**	34050	1
13	Ambagadia	34970	1
14	Taratara Chhaka Jn	39750	1
15	Chalavanthi Jn	40945	1
16	Fakipur	40945	1
17	Anandpur	42345	1

**NOTE:** THE DETAILS OF BUS BAYS ARE TO BE ADAPTED AS PER THE REQUIREMENTS OF THE LOCAL AUTHORITY. THE BUS BAYS MAY BE SHARDED AT SET-UP PER THE REQUIREMENTS OF THE LOCAL AUTHORITY. THE LOCAL AUTHORITY SHALL BE ADVISED AT LEAST 15 DAYS BEFORE THE COMMENCEMENT OF WORK. THE LOCAL AUTHORITY SHALL BE ADVISED AT LEAST 15 DAYS BEFORE THE COMMENCEMENT OF WORK. THE LOCAL AUTHORITY SHALL BE ADVISED AT LEAST 15 DAYS BEFORE THE COMMENCEMENT OF WORK.

**PROJECT:-**

**ODISHA STATE ROAD PROJECT UNDER WORLD BANK**

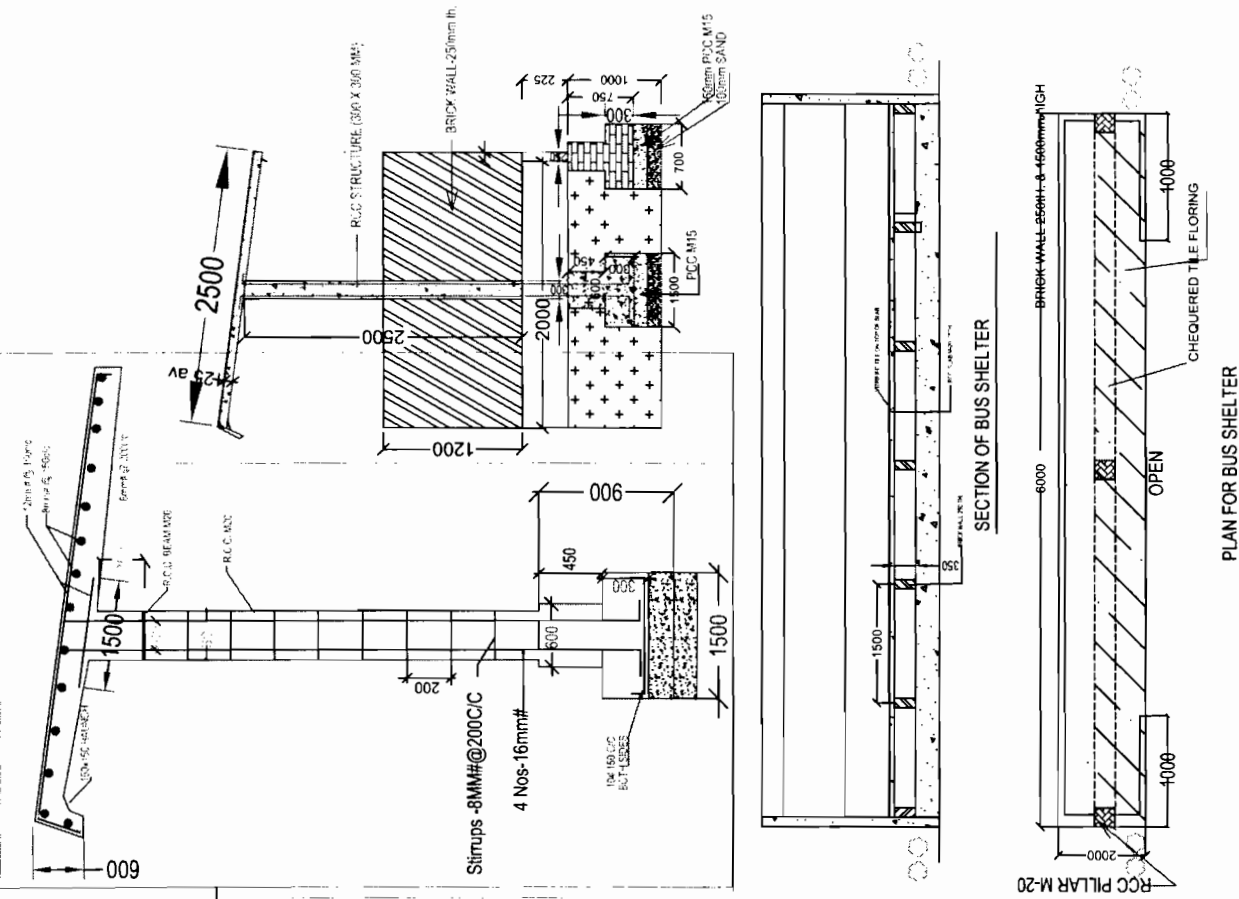
**CONSULTING ENGINEER, WB GROUP LTD**  
E-12, Moji Colony, Malviya Nagar Jaipur-17  
Tel: +91-141-2520899, 2521899, 2520556  
Fax: 2521348, e-mail: ceg@ceindia.com



**TYPICAL BUS BAY SHEET - 2**

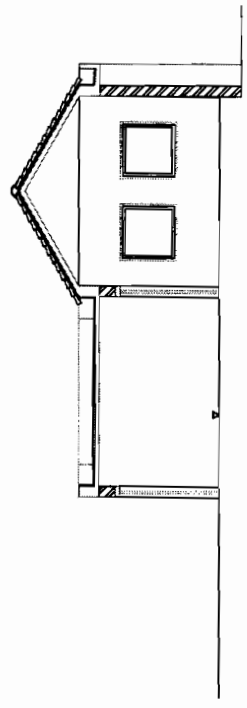
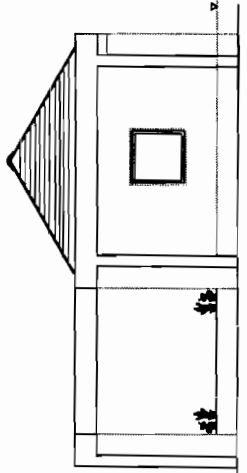
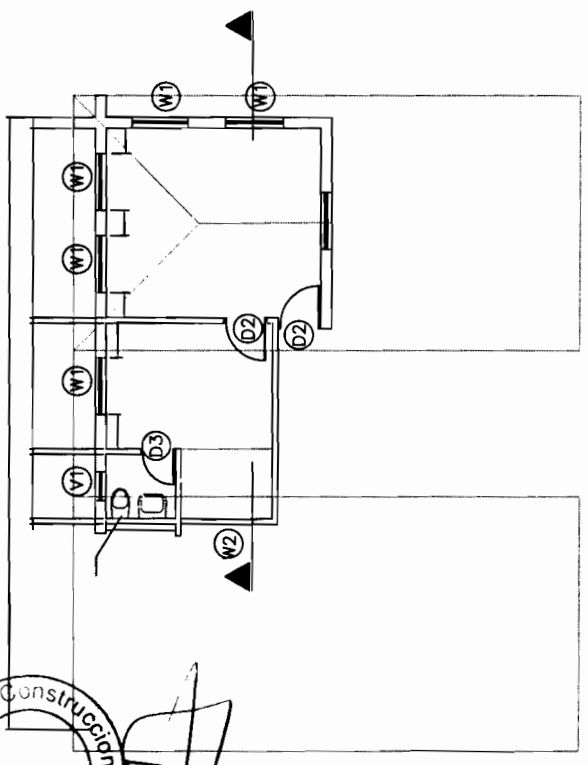
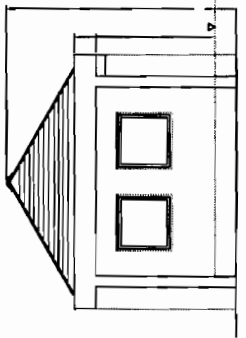
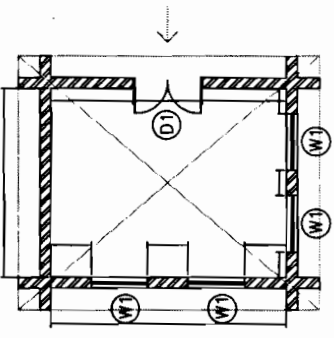
**(BHADRAK-ANANDPUR-BALANCE WORK)**

DRG NO.	OSR/PC/CEB/02	DESIGNED BY	CEG	DRAWN BY	CEG	APPROVED	CE/PMU
SH. NO.	36	DATE	18/01/13	REV	R-1	RECV'D	CE/WBP
SCALE	NTS						









SCHEDULE OF DOORS & WINDOWS

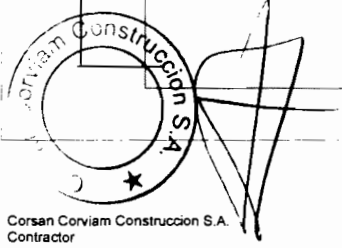
S. NO.	TYPE	WIDTH	OPENING HEIGHT	CILL LEV	LINTEL LEV
1.	D1	1500	2100	0.0	2100
2.	D2	900	2100	0.0	2100
3.	D3	750	2100	0.0	2100
4.	W1	1200	1200	+900	2100
5.	W2	900	1200	+900	2100
6.	V1	600	600	+1500	2100

**PROJECT:-**

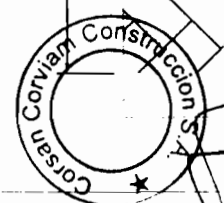
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE.

STANDARD DRAWINGS  
TOLL PLAZA MAIN OFFICE  
TOLL PLAZA LOCATION : KM.23+002 TO KM.23+400  
(BHADRAK-ANANDPUR-BALANCE WORK)

DRG NO. SH. NO.	DATE	REV	R1	APPROVED BY :	REV. BY :
001P0200A-0001P02 46	JAN.13	REV	R1	CEB LAL.	EX/PMU
SCALE	NTS			CEB LAL.	CE. WIP

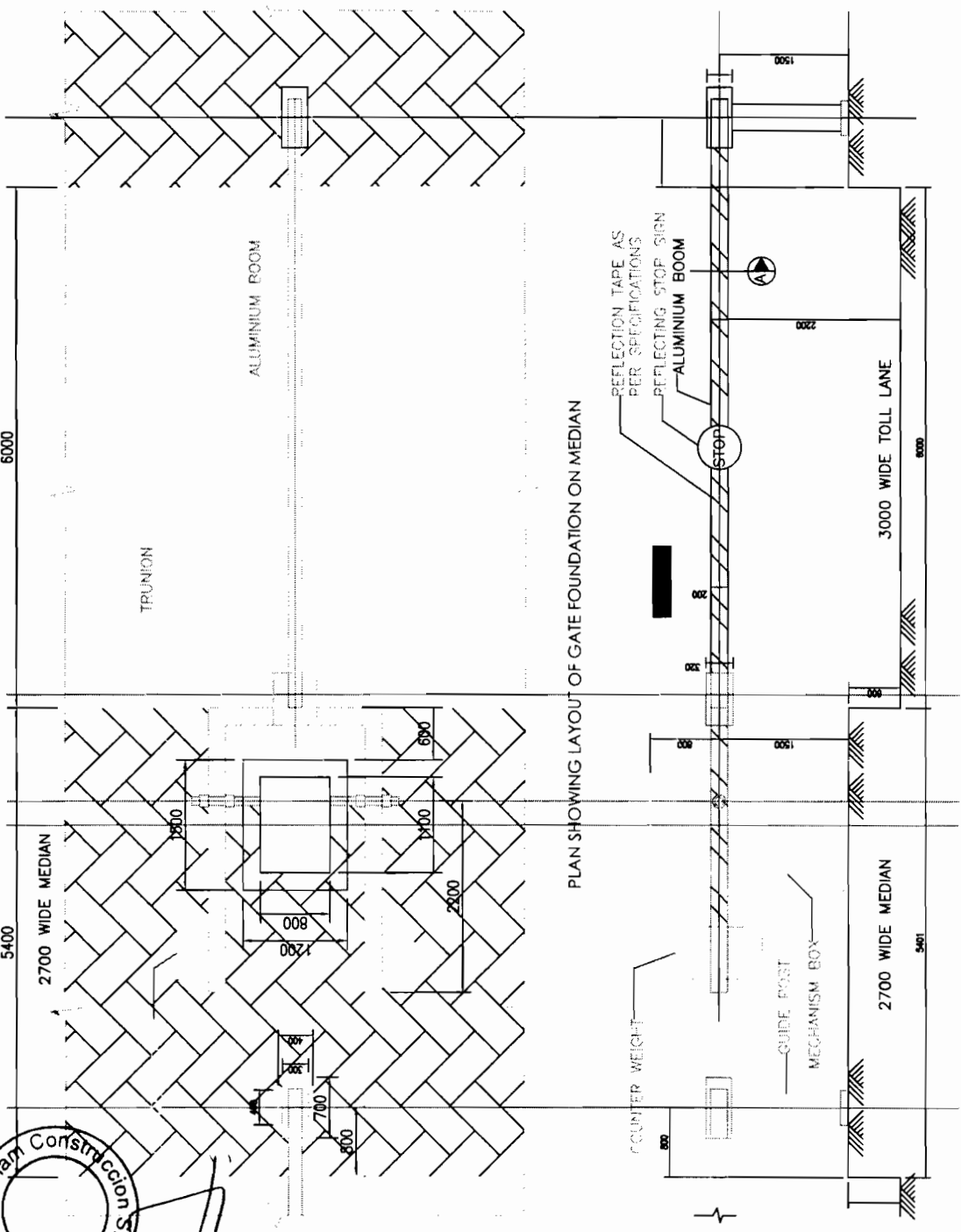




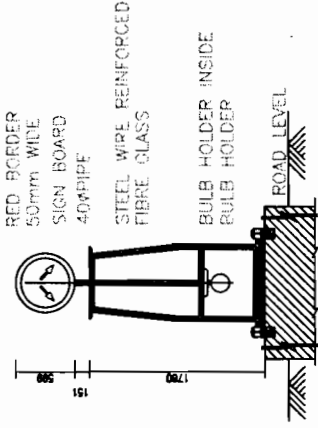


Corsan Corviam Construccion S.A.  
Contractor

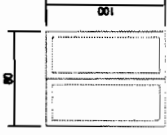
Chief Engineer,  
World Bank Project, Odisha  
the E.I.C. (Civil Engineering)  
Bhubaneswar.



PLAN SHOWING LAYOUT OF GATE FOUNDATION ON MEDIAN



TYPICAL DETAILS OF BOLLARD



DETAIL A

Note: All dimensions in millimeters if not specified

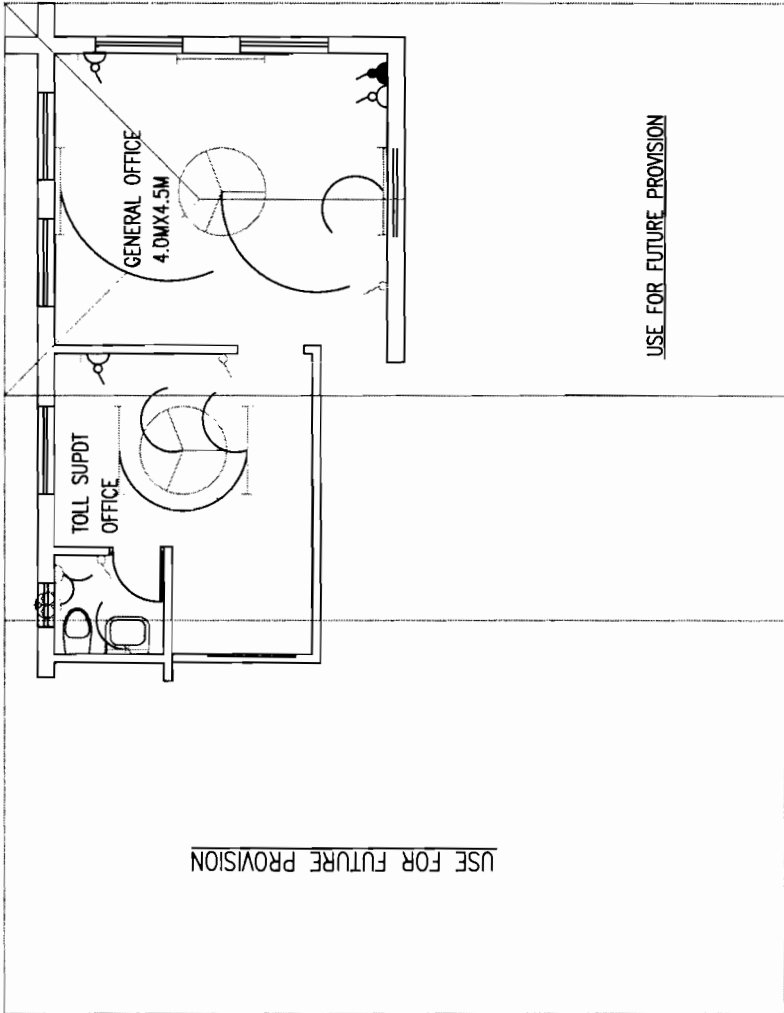
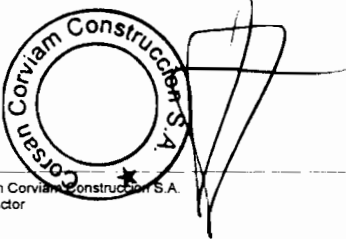
**PROJECT:-**

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE.

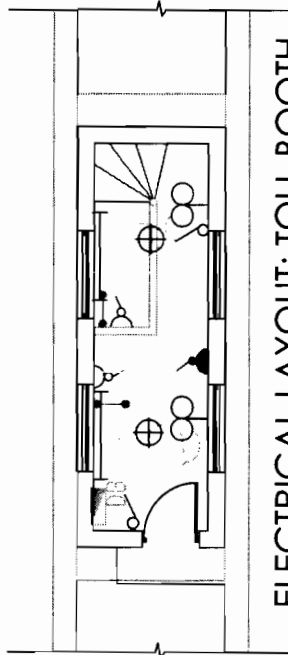
**STANDARD DRAWINGS**  
BARRIER GATE FOR TOLL PLAZA

TOLL PLAZA LOCATION :- KM.23+002 TO KM.23+400  
(BHADRAK-ANANDPUR-BALANCE WORK)

DRG NO.	OSR/ICE/COM-ANANDPUR/BA			REV. R1	APPROVED
SH. NO.	48	DATE	JAN. 13	REV	R1
SCALE	NTS			CRD U/L	EL/PNU
					CE. W/P



**ELECTRICAL LAYOUT: TOLL PLAZA MAIN OFFICE**



**ELECTRICAL LAYOUT: TOLL BOOTH**

- 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

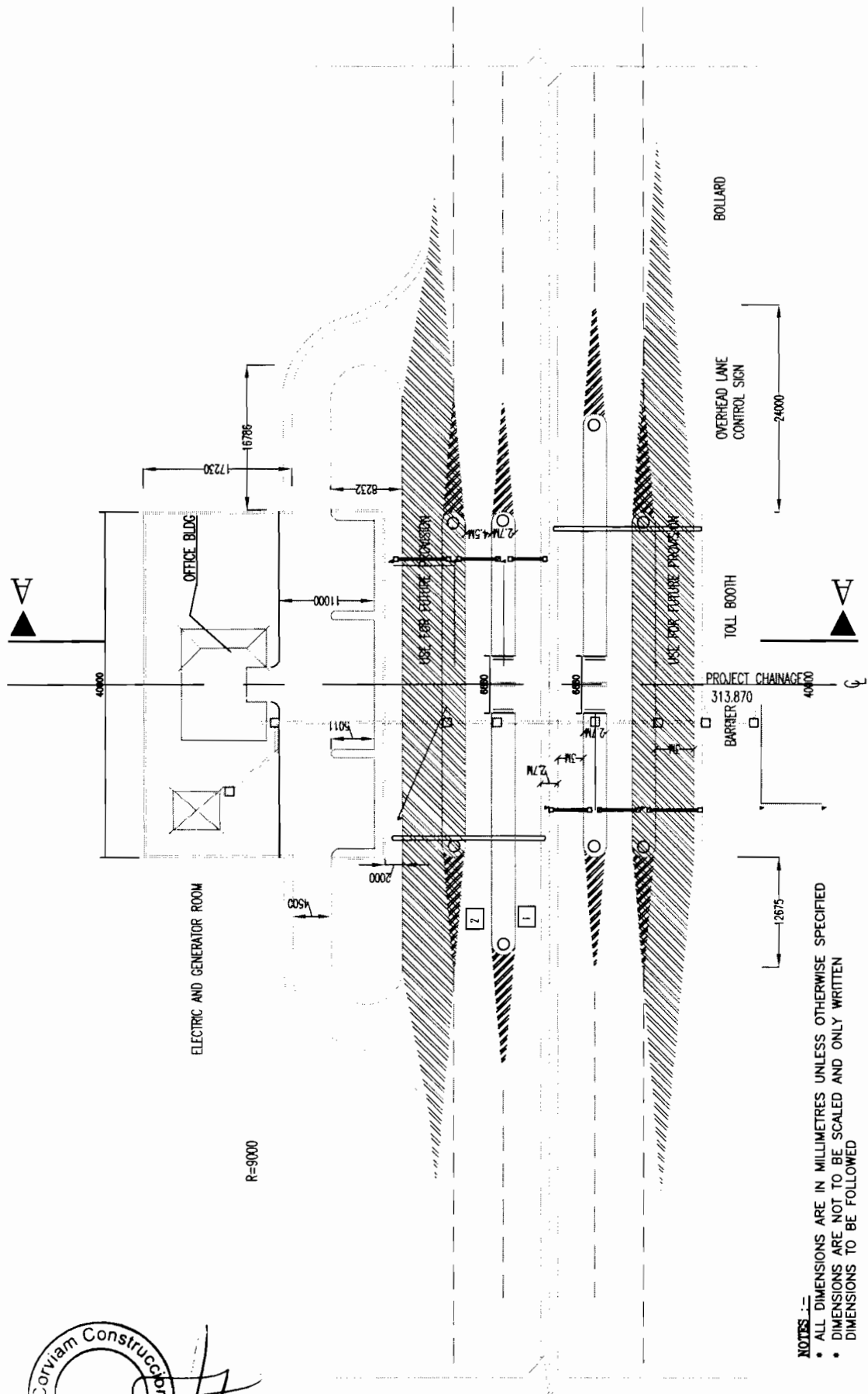
STANDARD DRAWINGS		ELECTRICAL LAYOUT		TOLL PLAZA AND MAIN OFFICE		TOLL PLAZA LOCATION :-KM.23+002 TO KM.23+400		REV. R1		APPROVED	
(BHADRAK-ANANDPUR-BALANCE WORK)		DRG NO. 49		DATE JAN.13		REV R1		PREPARED BY :		CE. WBP	
CORPORATION		SCALE		NTS		DRAWN BY :		CHECKED BY :		DATE	

**PROJECT:-**  
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE.

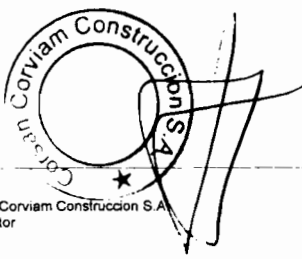
**STANDARD DRAWINGS**  
**ELECTRICAL LAYOUT - TOLL PLAZA**  
 TOLL PLAZA LOCATION :- KM.23+002 TO KM.23+400  
 (BHADRAK-ANANDPUR-BALANCE WORK)

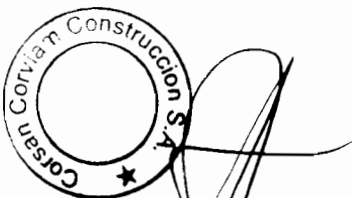
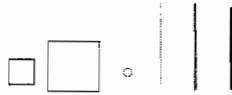
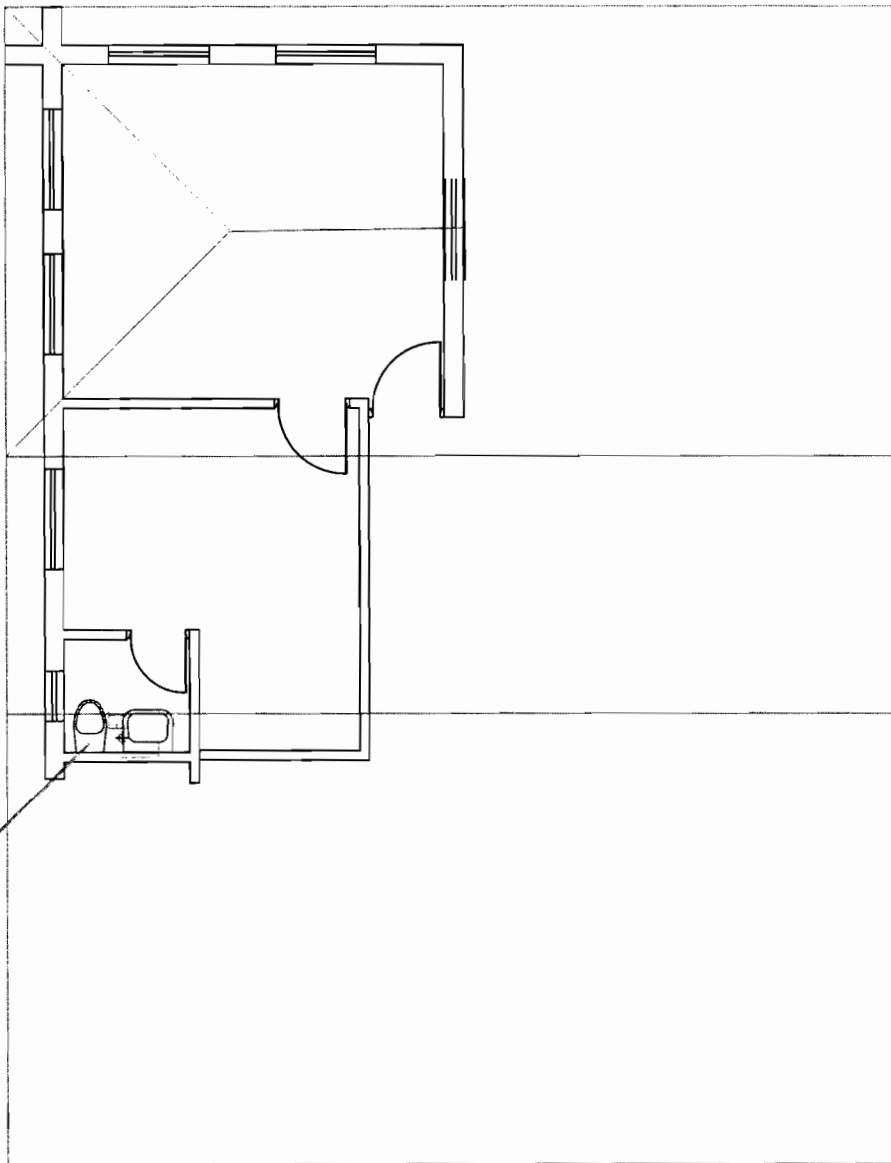
DRG NO. : CSP/PC/08A-CORVIA/108	REV. BY :	APPROVED :
SH. NO. : 50	DATE : JAN.13	REV. : R1
SCALE :	NTS	CD LAL
		CD/PAU
		CL. 100

**PROJECT:-**  
 ODISHA STATE ROAD PROJECT  
 UNDER WORLD BANK ASSISTANCE.



- NOTES :-**
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED
  - DIMENSIONS ARE NOT TO BE SCALED AND ONLY WRITTEN DIMENSIONS TO BE FOLLOWED





Corson Corviam Construction S.A.  
Contractor



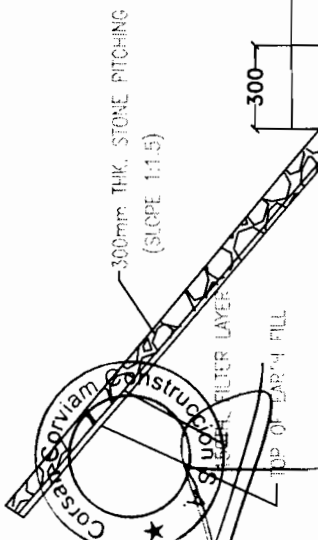
Chief Engineer  
World Bank Projects, Odisha  
World Bank Project Employer  
the E.I.C.(Civil), Odisha  
Bhubaneswar.

**PROJECT:-**

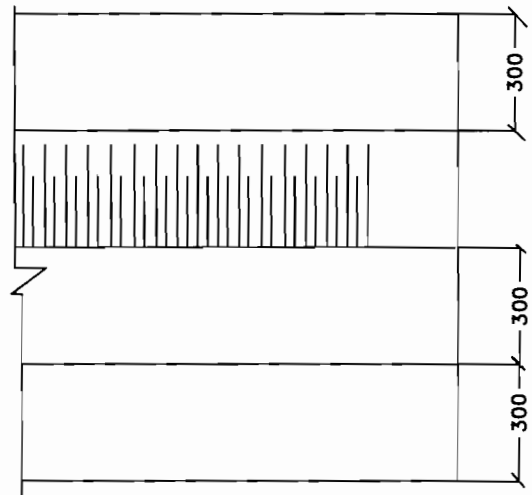
ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE.

**STANDARD DRAWINGS**  
**PLUMBING LAYOUT - TOLL PLAZA**  
TOLL PLAZA LOCATION :-KM.23+002 TO KM.23+400  
(BHADRAK-ANANDPUR-BALANCE WORK)

DRG NO.	OSR/ICE/CPA-KM/17/07	REV.	R1	APPROVED BY :	REV. RT	APPROVED
SH. NO.	51	DATE	JAN.13	PREPARED BY :	EE/PAU	CS, WBP
SCALE	NTS			CEB LIA.		



TOE WALL FOR POND  
( CROSS SECTION )



PLAN OF TOE WALL FOR WATER BODY

SCHEDULE OF TOE WALL, SH-53

Sl. No.	Items	Chainage at km	Location left /right	Length of toe wall in Mtrs.
1	Pond	2.448	C	75
2	Pond	2.8	R	35
3	Pond	6.6	L	10
4	Pond	8.915	R	25
5	Pond	13.713	L	20
6	Pond	13.737	L	15
7	Pond	17.1	C	15
8	Pond	17.74	R	5
9	Pond	17.74	R	5
10	Pond	19.614	R	135
11	Pond	19.665	L	45
12	Pond*	20.27	L	85
13	Pond*	20.868	L	25
14	Pond	22.29	L	10
15	Pond	26.59	R	20
16	Pond	31.484	L	25
17	Pond	36.723	L	40
18	Pond	37.35	L	265
<b>Total</b>				<b>865</b>

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

**PROJECT:-**

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

TYPICAL PCC TOE WALL WITH STONE PITCHING FOR WATER BODIES AS ENVIRONMENTAL MITIGATION.

(BHADRAK-ANANDPUR\_BALANCE WORK)

DRG. NO.	OSRP/CEG/SH-53/ENV/03	DESIGNED BY	CEG	DRAWN BY	CEG	REVVI	APPROVED
SH. NO.		DATE	31/12/12	REV	R-1	EE,PMU	CE,WBP
SCALE		NTS					

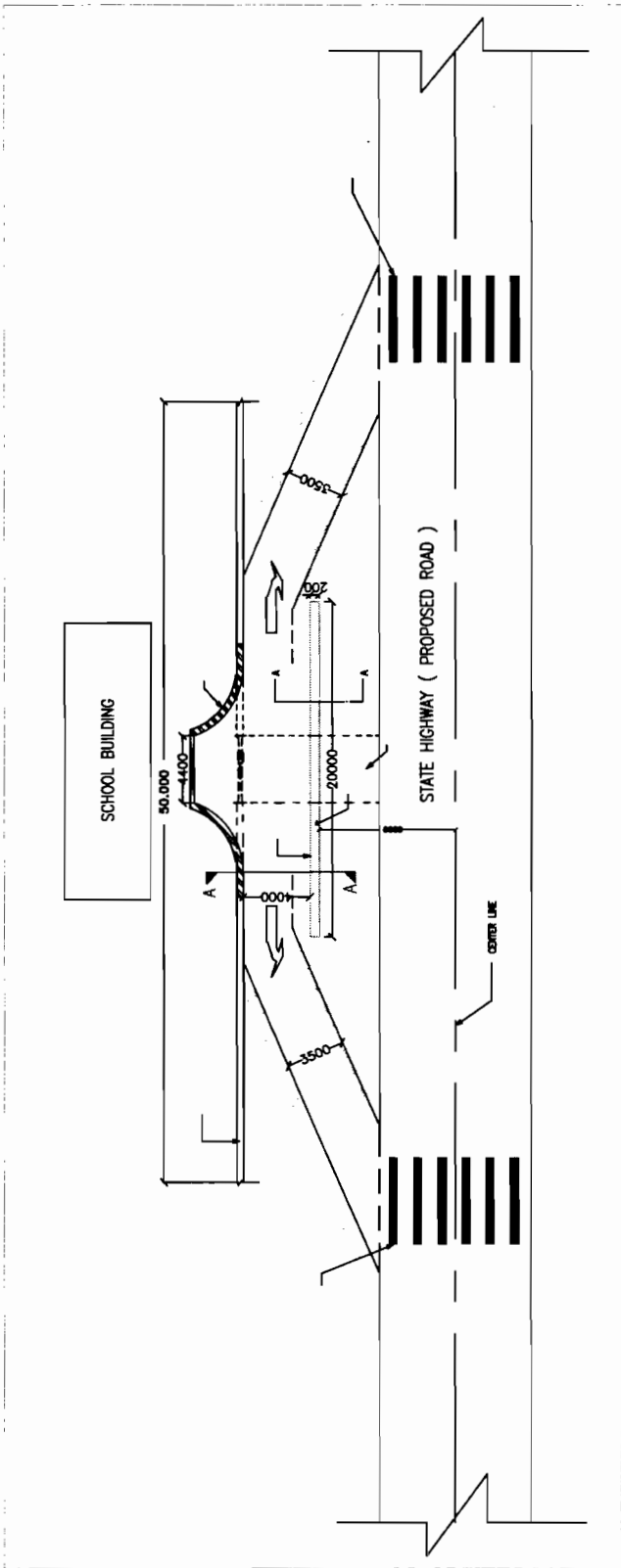
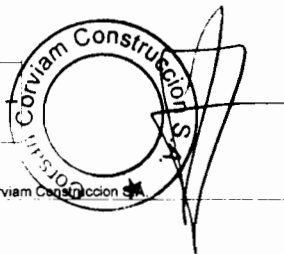
**CONSULTING ENGINEERS GROUP LTD.**  
E-12, Moji Colony, Malviya Nagar, Jaipur-17  
Tel: +91-141-2520899, 2521899, 2520556  
Fax: 2521348, e-mail: ceg@cegroupindia.com





SCHEDULE FOR INTERCEPTIVE BARRICADE  
School 44-700

Corsan Corviam Construction SPA  
Contractor



- 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 AREA, G.P 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 ERRECTED 4m AWAY FROM THE ENTRY POINT INFRONT OF THE GATE

**PROJECT:-**

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

**CONSULTING ENGINEERS GROUP LTD.**

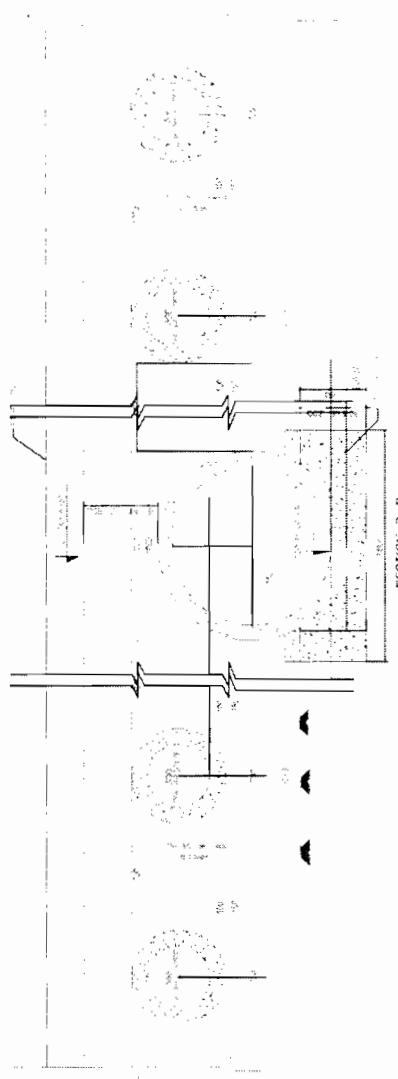
E-12, Moji Colony, Malviya Nagar, Jaipur-17  
Tel: +91-141-2520899, 2521899, 2520556  
Fax: 2521348, e-mail: ceg@cegindia.com



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

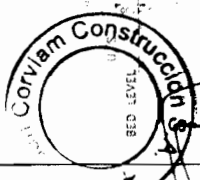
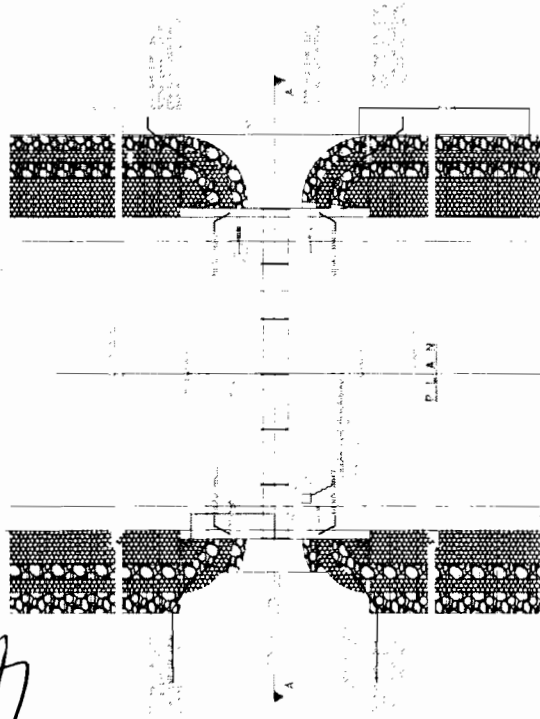
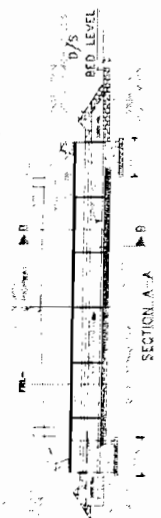
METAL BARRICADES FOR EDUCATIONAL AND MEDICAL INSTITUTIONAL APPROACHES AS ENVIRONMENTAL MITIGATION PLAN.			
DRG NO. CDRP/CEG/SH-53/ENV/05	DESIGNED BY	DRAWN BY	APPROVED
SH. NO.	DATE 31/12/12	REV R-1	EE, PMU
SCALE	NTS	CEG	CE, WBP

# REPTILE UNDER PASS



## SCHEDULE

Sl. No	Proposed Chainage
1	11+869
2	13+800
3	17+200
4	21+750
5	41+100



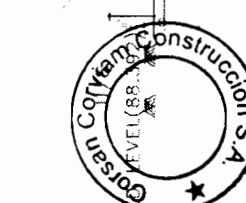
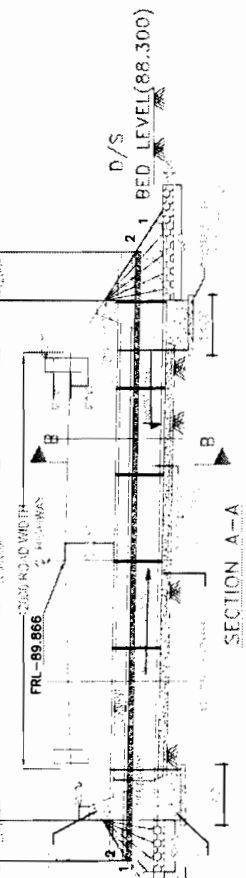
Corsan Corviam Construcion S.A.  
Contractor

Chief Engineer,  
World Bank Project, Orissa  
World Bank Project

Oro the E.I.C.(Civil), Orissa  
Bhubaneswar.

OSISHA STATE ROADS PROJECT Works Department, Govt. of Orissa		REPTILE UNDER PASS+CULVERT (GEN) BHADRAK-ANANDPUR-BALANCE WORK	
Rev No.:	DATE: JAN, 2013	DRG NO.:	OSRPIEW-14
		SCALE:	NTS
		REV.1	EE/PMU
		APPROVED	CE WBP

NOTES:

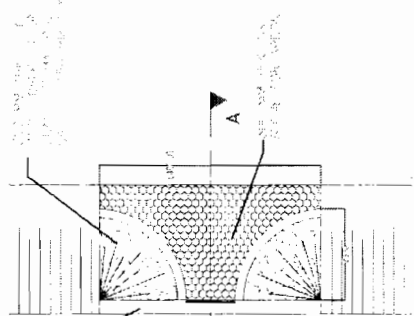


Corstan Corviam Construction S.A.  
Contractor

DETAIL OF HEAD WALL

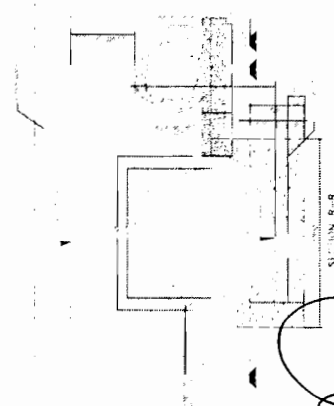
SCHEDULE OF MATERIALS

Sl. No.	Chainage	Item	Quantity
1	1+740	1	3+15.00
2	4+260	1	3+15.00
3	7+300	1	3+15.00
4	8+850	1	3+15.00
5	11+050	1	3+15.00
6	13+240	1	4+14.00
7	15+640	1	4+14.00
8	20+610	1	4+14.00
9	23+950	1	4+14.00
10	25+430	1	4+14.00
11	26+200	1	4+14.00
12	27+200	1	4+14.00
13	30+500	1	4+14.00



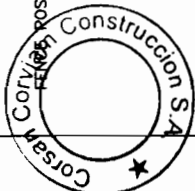
UTILITY DUCT

PLAN



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

OSISHA STATE ROADS PROJECT Works Department, Govt. of Orissa		DATE: JAN, 2013		UTILITY DUCT+CULVERT (GEN) BHADRAK-ANANDPUR-BALANCE WORK	
Rev No.:		DRG NO.:	OSR/PIENV-15	REV 1	APPROVED
		SCALE:	NTS	EE/PMU	CE/WBP



Corsan Corviam Construccion S.A  
Contractor

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

**CONSULTING  
ENGINEERS GROUP LTD.**

E-12, Moji Colony, Malviya Nagar Jaipur-17  
Teli: +91-141-2520899, 2521899, 2520556  
Fax: 2521348, e-mail: ceg@cegindia.com



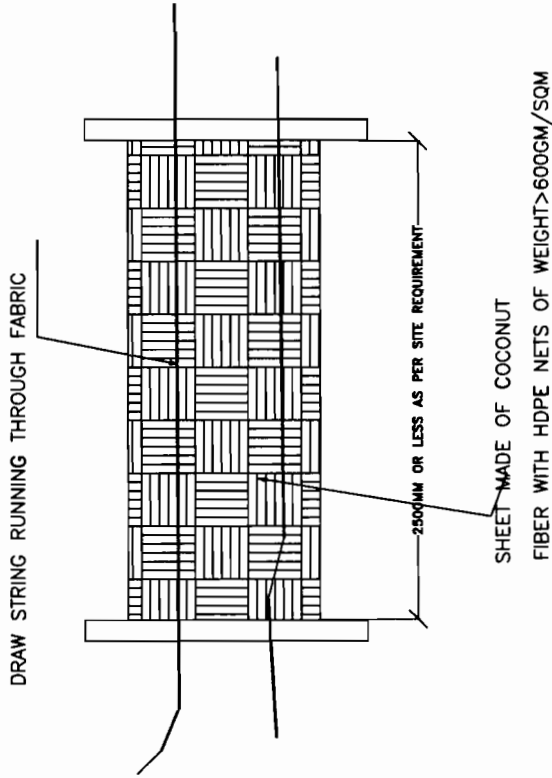
PROJECT:-

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

TYPICAL STANDARD DRAWING FOR SILT FENCE

(BHADRAK-ANANDPUR\_BALANCE WORK)

DRG NO. OSRP/CEG/SH-53/ENV/03	DESIGNED BY	DRAWN BY	REV/V1	APPROVED
SH. NO.	DATE 31/12/12	REV	R-1	EE, PMU
SCALE	NTS			CEG
				CE, WBP

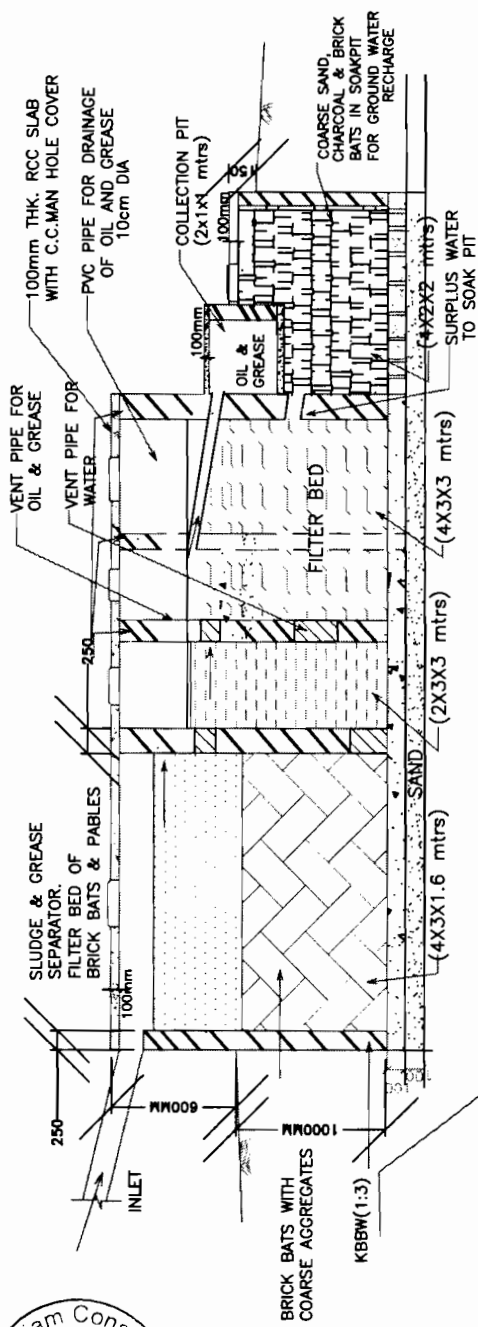
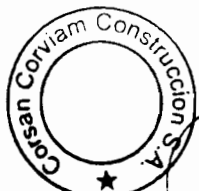


SILT FENCE SEDIMENT BARRIER

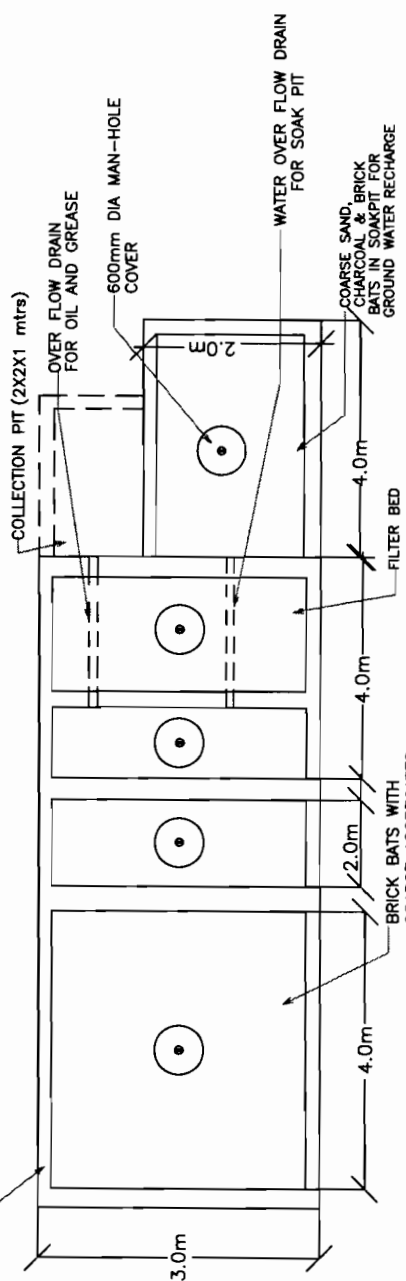
NO SCALE

SCHEDULE:

LENGTH :- LUMP SUM QNTY-2000M



**SECTION OF SOAK PIT**



**PLAN OF SOAK PIT**

NOTE: PROVIDE AT CONTRACTOR'S PLANT SITE.

PROJECT:-

**CONSULTING ENGINEERS GROUP LTD.**  
E-12, Mojil Colony, Malviya Nagar Jaipur-17  
Tel: +91-141-2520899, 2521899, 2520556  
Fax: 2521348, e-mail: ceg@cegroupindia.com



**OIL & GREASE TRAP FOR PLANT SITE**

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

(BHADRAK-ANANDPUR\_BALANCE WORK)

DRG NO. OSRP/CEG/SH-53/EN/06	DESIGNED BY	DRAWN BY	REV11	APPROVED
SH. NO.	DATE 31/12/12	REV	R-1	
SCALE	NTS		CEG	CEG
			EE, PMU	CE, WBP



**GENERAL**

1. THESE NOTES ARE APPLICABLE FOR RCC SLAB BRIDGES.
2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE MENTIONED. ONLY DIMENSIONS ARE TO BE FOLLOWED. NO DRAWING SHALL BE SCALED.
3. DESIGN CRITERIA:  
 (a) IRC : 5-1980  
 (b) IRC : 6-1980  
 (c) IRC : 21-2000  
 (d) IRC : 302.4-2000

4. THE DESIGN IS ACCORDING TO FOLLOWING CODES:  
 (a) IRC : 5-1980  
 (b) IRC : 6-1980  
 (c) IRC : 21-2000  
 (d) IRC : 302.4-2000
5. THE FOLLOWING LOADS HAVE BEEN CONSIDERED IN THE DESIGN:  
 (a) IRC : 5-1980  
 (b) IRC : 6-1980  
 (c) IRC : 21-2000  
 (d) IRC : 302.4-2000

6. THE FOLLOWING LOADS HAVE BEEN CONSIDERED IN THE DESIGN:  
 (a) IRC : 5-1980  
 (b) IRC : 6-1980  
 (c) IRC : 21-2000  
 (d) IRC : 302.4-2000
7. THE FOLLOWING LOADS HAVE BEEN CONSIDERED IN THE DESIGN:  
 (a) IRC : 5-1980  
 (b) IRC : 6-1980  
 (c) IRC : 21-2000  
 (d) IRC : 302.4-2000

8. THE FOLLOWING LOADS HAVE BEEN CONSIDERED IN THE DESIGN:  
 (a) IRC : 5-1980  
 (b) IRC : 6-1980  
 (c) IRC : 21-2000  
 (d) IRC : 302.4-2000
9. THE FOLLOWING LOADS HAVE BEEN CONSIDERED IN THE DESIGN:  
 (a) IRC : 5-1980  
 (b) IRC : 6-1980  
 (c) IRC : 21-2000  
 (d) IRC : 302.4-2000

10. THE FOLLOWING LOADS HAVE BEEN CONSIDERED IN THE DESIGN:  
 (a) IRC : 5-1980  
 (b) IRC : 6-1980  
 (c) IRC : 21-2000  
 (d) IRC : 302.4-2000
11. THE FOLLOWING LOADS HAVE BEEN CONSIDERED IN THE DESIGN:  
 (a) IRC : 5-1980  
 (b) IRC : 6-1980  
 (c) IRC : 21-2000  
 (d) IRC : 302.4-2000

12. THE FOLLOWING LOADS HAVE BEEN CONSIDERED IN THE DESIGN:  
 (a) IRC : 5-1980  
 (b) IRC : 6-1980  
 (c) IRC : 21-2000  
 (d) IRC : 302.4-2000
13. THE FOLLOWING LOADS HAVE BEEN CONSIDERED IN THE DESIGN:  
 (a) IRC : 5-1980  
 (b) IRC : 6-1980  
 (c) IRC : 21-2000  
 (d) IRC : 302.4-2000

14. THE FOLLOWING LOADS HAVE BEEN CONSIDERED IN THE DESIGN:  
 (a) IRC : 5-1980  
 (b) IRC : 6-1980  
 (c) IRC : 21-2000  
 (d) IRC : 302.4-2000
15. THE FOLLOWING LOADS HAVE BEEN CONSIDERED IN THE DESIGN:  
 (a) IRC : 5-1980  
 (b) IRC : 6-1980  
 (c) IRC : 21-2000  
 (d) IRC : 302.4-2000

16. THE FOLLOWING LOADS HAVE BEEN CONSIDERED IN THE DESIGN:  
 (a) IRC : 5-1980  
 (b) IRC : 6-1980  
 (c) IRC : 21-2000  
 (d) IRC : 302.4-2000
17. THE FOLLOWING LOADS HAVE BEEN CONSIDERED IN THE DESIGN:  
 (a) IRC : 5-1980  
 (b) IRC : 6-1980  
 (c) IRC : 21-2000  
 (d) IRC : 302.4-2000

18. THE FOLLOWING LOADS HAVE BEEN CONSIDERED IN THE DESIGN:  
 (a) IRC : 5-1980  
 (b) IRC : 6-1980  
 (c) IRC : 21-2000  
 (d) IRC : 302.4-2000
19. THE FOLLOWING LOADS HAVE BEEN CONSIDERED IN THE DESIGN:  
 (a) IRC : 5-1980  
 (b) IRC : 6-1980  
 (c) IRC : 21-2000  
 (d) IRC : 302.4-2000

2. SPACING GIVEN FOR ALL REINFORCEMENT IS PERPENDICULAR TO BAR UNLESS OTHERWISE SHOWN ON DRAWINGS.
- EARTH FILL/EMBANKMENT**  
 BACK FILLING MATERIAL SHOULD CONFIRM TO CL 305.2 OF MoRT&H's SPECIFICATION (FOURTH REVISION 2001).

- WATER**  
 WATER TO BE USED IN CONCRETING AND CURING SHALL BE CONFORMING TO CLAUSE 302.4 OF IRC 21-2000.
- WORKMANSHIP/DETAILING**  
 MINIMUM CLEAR COVER TO ANY REINFORCEMENT INCLUDING STIRRUPS SHALL BE 50 MM UNLESS OTHERWISE SHOWN IN THE DRAWINGS.  
 FOR ENSURING PROPER COVER OF CONCRETE TO REINFORCEMENT SPECIALLY MADE POLYMER COVER BLOCKS SHALL BE USED.

- 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/LAINTANCE AND MADE ROUGH SO THAT 1/2 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.

- WELDING OF REINFORCEMENT BARS SHALL NOT BE PERMITTED.**
- LAPS IN REINFORCEMENT:**  
 I 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

- BENDING OF REINFORCEMENT BARS SHALL BE AS PER IS:2502**
- SUPPORTING CHAIRS OF 12 MM DIAMETER SHALL BE PROVIDED AT SUITABLE INTERVALS AS PER IS:2502.**
- CONCRETE SHALL BE PRODUCED IN A MECHANICAL MIXER OF CAPACITY NOT LESS THAN 2000 LITS HAVING INTEGRAL WEIGH-BATCHING FACILITY AND AUTOMATIC WATER MEASURING AND DISPENSING DEVICE.**
- PROPER COMPACTATION OF CONCRETE SHALL BE ENSURED BY USE OF FORM AND/OR NEEDLE VIBRATORS. USE OF FULL WIDTH SCREEN VIBRATORS FOR COMPACTON OF CONCRETE IN DECK SLAB SHALL BE ENSURED.**
- PROPERLY BRACED STEEL PLATES SHALL BE USED AS SHUTTERING.**
- SHARP EDGES OF CONCRETE SHALL BE CHAMFERED.**

- CONCRETE**  
 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
- 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.**
- 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.**
- TO IMPROVE WORKABILITY OF CONCRETE USE OF ADMIXTURES CONFIRMING TO IS 9103 MAY BE MADE WITH APPROVAL OF ENGINEER INCHARGE.**
- AGGREGATE SHALL CONFIRM TO CL 302.3 OF IRC:21-2000**

- REINFORCEMENT**  
 ALL REINFORCEMENT SHALL BE HIGH YIELD STRENGTH DEFORMED BARS (GRADE DESIGNATION S 500) CONFORMING TO IS:1786 CONFIGURATION IS SHOWN AS :  
 TOR BAR  
 #10 @200C/C  
 DIA OF BAR  
 SPACING OF BARS

- REINFORCEMENT**  
 ALL REINFORCEMENT SHALL BE HIGH YIELD STRENGTH DEFORMED BARS (GRADE DESIGNATION S 500) CONFORMING TO IS:1786 CONFIGURATION IS SHOWN AS :  
 TOR BAR  
 #10 @200C/C  
 DIA OF BAR  
 SPACING OF BARS

- REINFORCEMENT**  
 ALL REINFORCEMENT SHALL BE HIGH YIELD STRENGTH DEFORMED BARS (GRADE DESIGNATION S 500) CONFORMING TO IS:1786 CONFIGURATION IS SHOWN AS :  
 TOR BAR  
 #10 @200C/C  
 DIA OF BAR  
 SPACING OF BARS

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:**  
 THE WORK SHALL BE EXECUTED IN ACCORDANCE WITH MoRT&H's SPECIFICATION FOR ROAD AND BRIDGE WORKS (FOURTH REVISION 2001) EXCEPT WHEREVER OTHERWISE MENTIONED.
- FOUNDATION :-**  
 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.

1. 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.

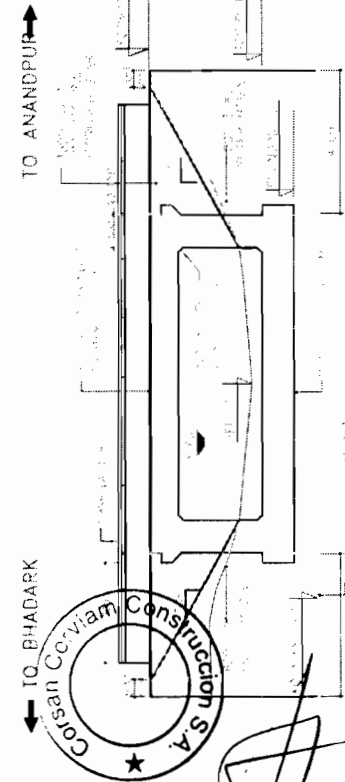
- RAILINGS :-**  
 FOR PARAPET RAILINGS MoRT&H STANDARD DRAWINGS OR EQUIVALENT SHALL BE FOLLOWED AS PER THE DIRECTION OF THE ENGINEER.

DESIGNED BY	DATE	SCALE	REVISION

**GENERAL NOTES  
(FOR RCC SLAB BRIDGES)**

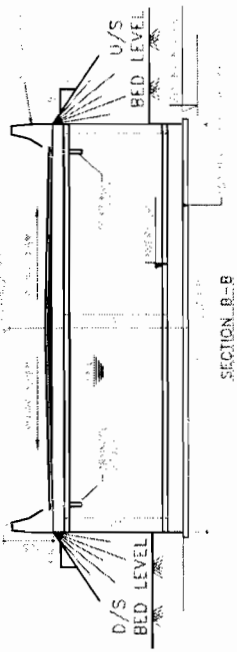
**ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE**

**CONSULTING ENGINEERS GROUP LTD.**  
 E-12, 1st Floor, Cuttack, Odisha  
 Tel. : 491-141 - 232000, 232100, 232008  
 Fax : 2321344, E-mail: ce@cegroup.co.in

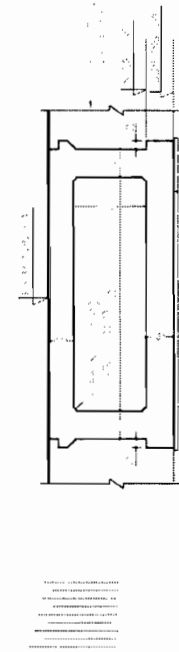


SECTION A-A

PROPOSED LEVEL (m)	24.874	27.250
EXISTING LEVEL (m)	24.571	27.250
PROPOSED LEVEL (m)	24.874	27.250
EXISTING LEVEL (m)	24.571	27.250



SECTION B-B



DIMENSION DETAILS OF BOX

**DIMENSION DETAILS OF BOX**

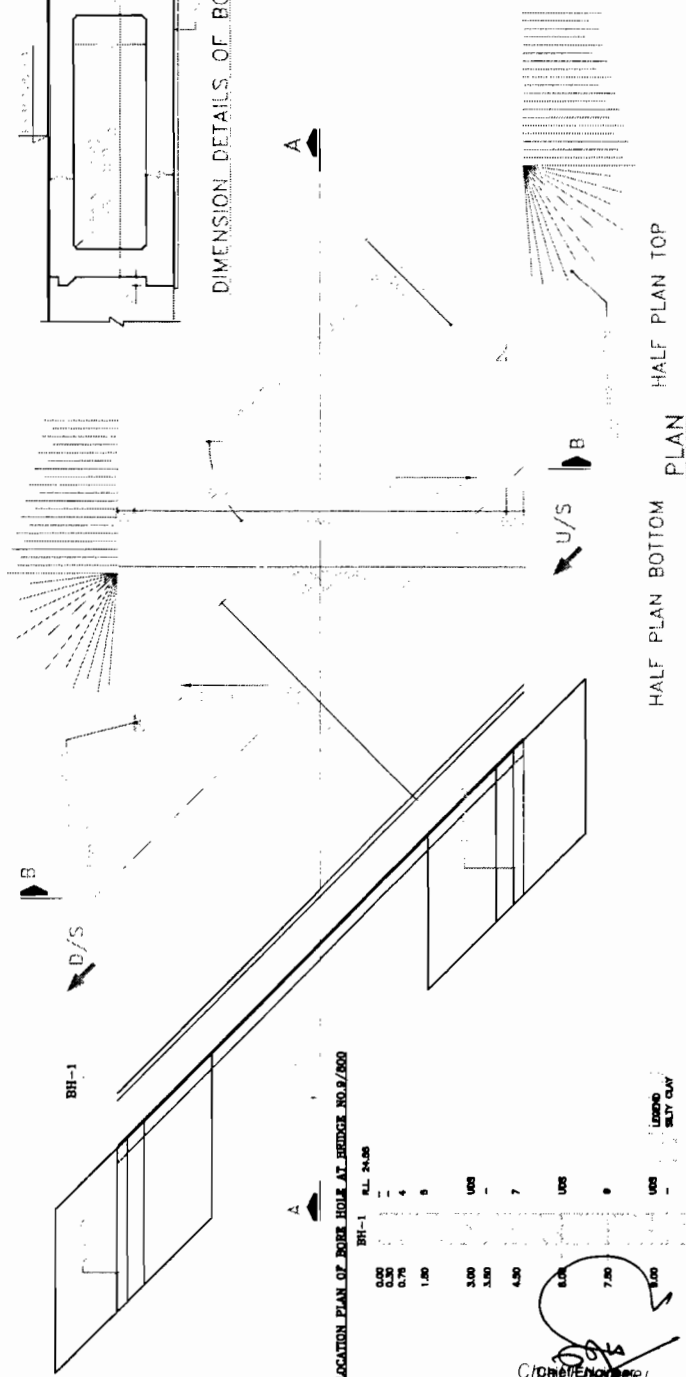
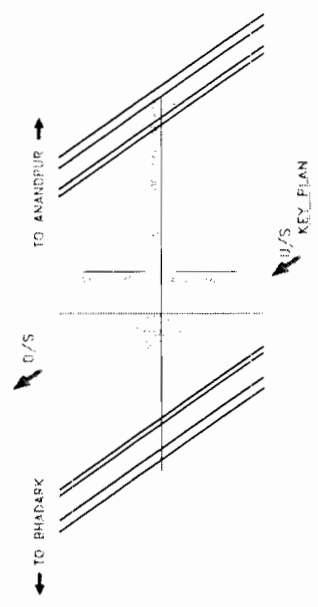
BOX TYPE	WIDTH (mm)	HEIGHT (mm)	THICKNESS (mm)	THICKNESS (mm)	THICKNESS (mm)	BEARING CAPACITY
	a	b	c	d	e	f
	1000	1000	100	100	100	100

BOX TYPE	EXISTING PROPOSED LOCATION CHANGE (m)	FORMATION LEVEL (m)	DESIGN HGT (m)	RED LVL (m)	INVERT LEVEL (m)	FOUNDING LVL (m)	CLEAR HEIGHT (MAX) Lx (m)	H (m)	DIRECTION OF FLOW

NOTES:

REFERENCE DRAWING:-



LOCATION PLAN OF BORE HOLE AT BRIDGE NO.8/800

BH-1

ALL 24.08

0.00

0.75

1.50

3.00

3.00

4.50

6.00

7.50

9.00

10.00

10.00

10.00

10.00

HALF PLAN BOTTOM HALF PLAN TOP

**GENERAL ARRANGEMENT DRAWING**  
BRIDGE AT PROPOSED CH.10+016 (MASINPUR NALA)

DESIGNED BY	CHKD BY	APPROVED BY

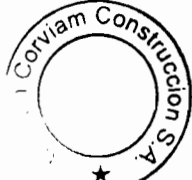
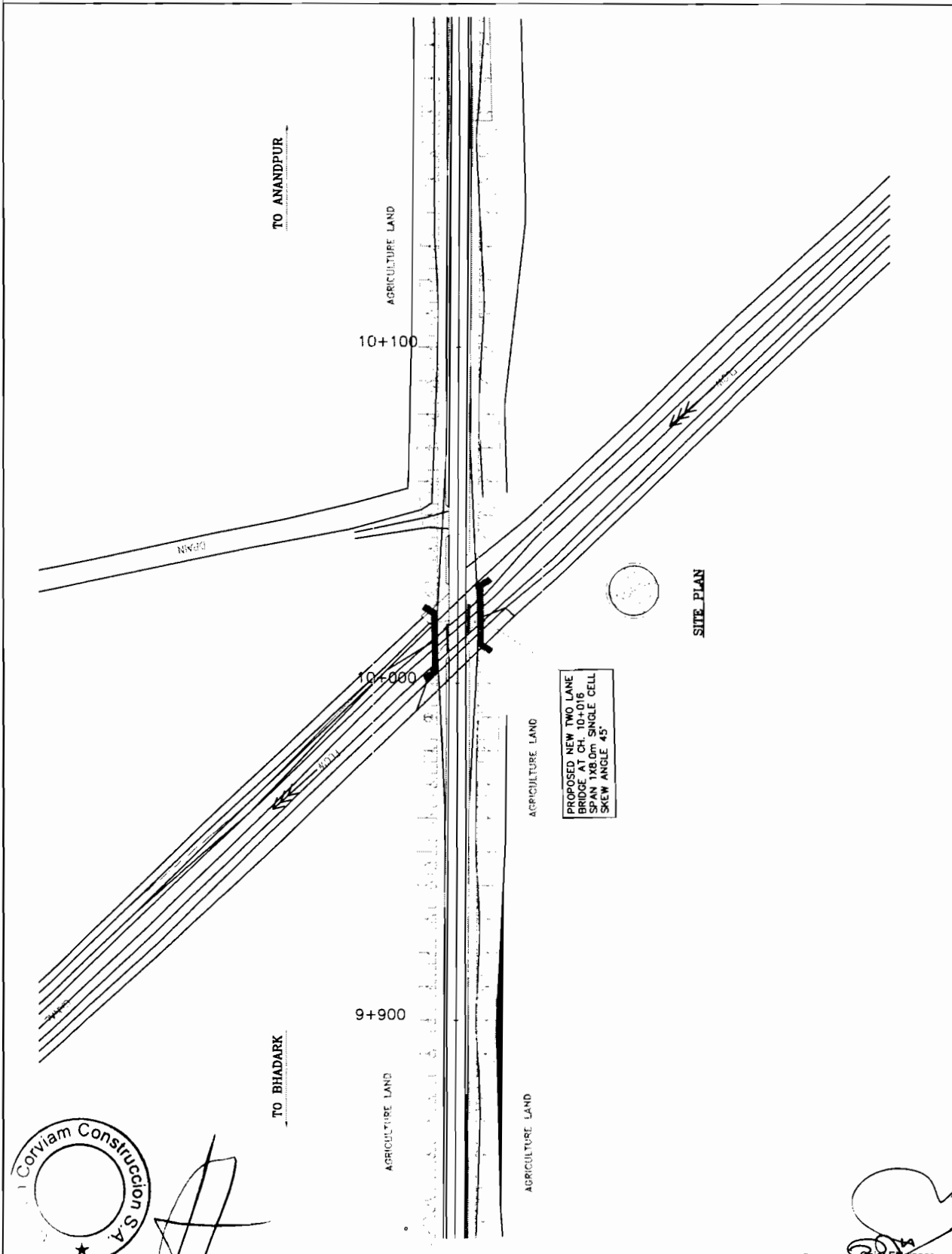
ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE

PROVIDED:

**CONSULTING ENGINEERS GROUP LTD.**  
E-3/3/15, Market Road, Bhubaneswar-751017  
Ph: 431-441-430800, 431-690, 252-2536  
Fax: 251-144, e-mail: [cep@engineersgroup.com](mailto:cep@engineersgroup.com)



NOTES:-



Corviam Construction S.A.  
Contractor

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

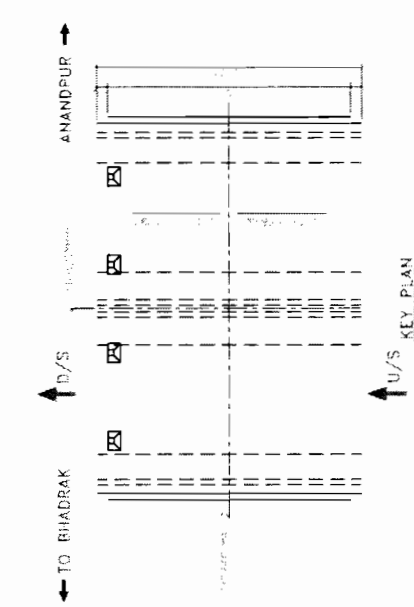
<p>ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE</p>	<p>SITE PLAN</p>	
	<p>BRIDGE AT PROPOSED CH.10+016 (HASINPUR NALA)</p>	
<p>CONSULTING ENGINEERS GROUP LTD. F-12/60/1 Colony, Madhya Nagar, Bhubaneswar-751009 Tel: 2521141, 2520899, 2521891, 2520036 Fax: 2521340, E-mail: cep@egp.co.in</p>	<p>PROJECT NO. / SHEET NO. / DRAWING NO. / DATE / SCALE</p>	

**NOTES:**

1. The bridge is to be constructed on the existing ground level. The ground level is to be as shown in the plan and section drawings. The bridge is to be constructed on the existing ground level. The ground level is to be as shown in the plan and section drawings. The bridge is to be constructed on the existing ground level. The ground level is to be as shown in the plan and section drawings.

**REFERENCE DRAWINGS**

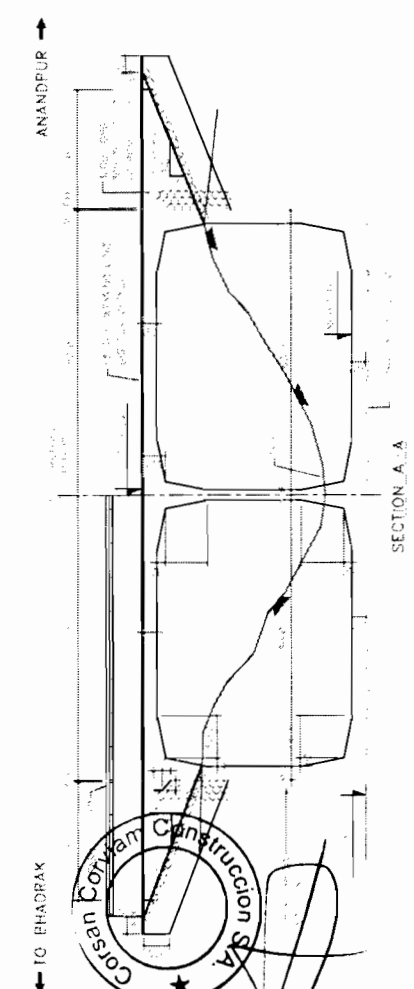
1. The bridge is to be constructed on the existing ground level. The ground level is to be as shown in the plan and section drawings. The bridge is to be constructed on the existing ground level. The ground level is to be as shown in the plan and section drawings. The bridge is to be constructed on the existing ground level. The ground level is to be as shown in the plan and section drawings.



**KEY PLAN**

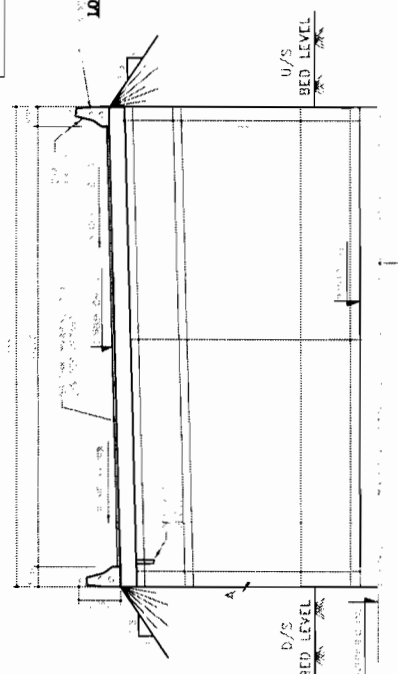
**BOX LEVELS DETAILS**

ITEM NO.	DESCRIPTION	PERMANENT	TEMPORARY	PERMANENT	TEMPORARY
1	...	...	...	...	...
2	...	...	...	...	...
3	...	...	...	...	...
4	...	...	...	...	...
5	...	...	...	...	...
6	...	...	...	...	...
7	...	...	...	...	...
8	...	...	...	...	...
9	...	...	...	...	...
10	...	...	...	...	...

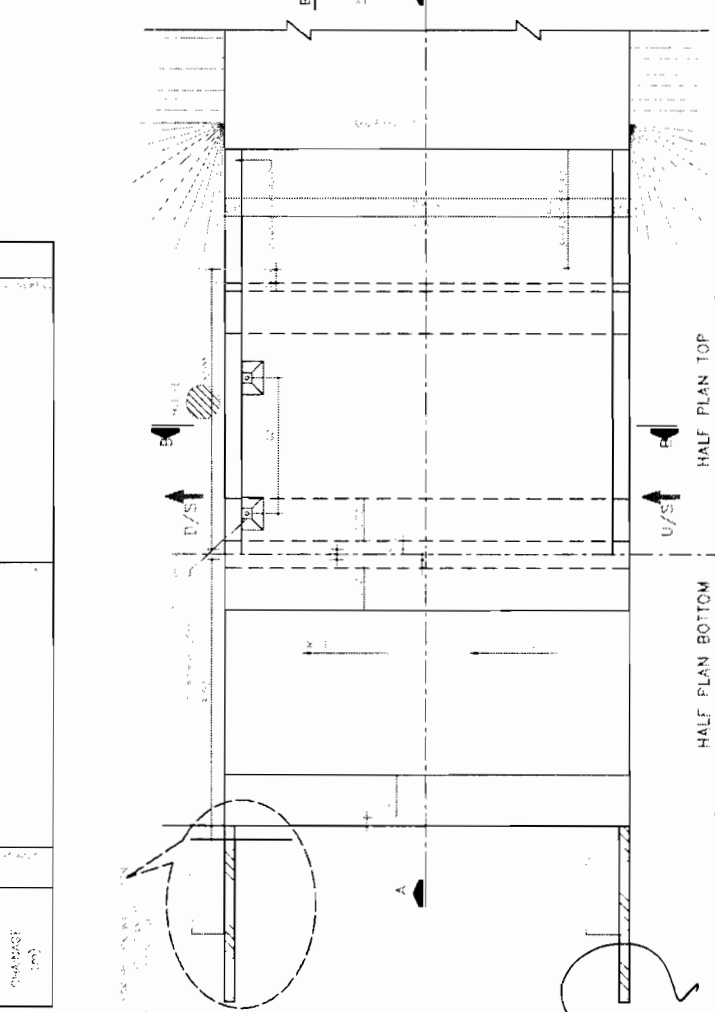


**SECTION A-A**

ITEM NO.	DESCRIPTION	PERMANENT	TEMPORARY	PERMANENT	TEMPORARY
1	...	...	...	...	...
2	...	...	...	...	...
3	...	...	...	...	...
4	...	...	...	...	...
5	...	...	...	...	...
6	...	...	...	...	...
7	...	...	...	...	...
8	...	...	...	...	...
9	...	...	...	...	...
10	...	...	...	...	...



**SECTION B-B**



**PLAN**

**LOCATION PLAN OF BORE HOLE AT BRIDGE NO. 11/600**

DEPTH (m)	SOIL TYPE
0.00	CLAYEY SILT WITH SAND
1.00	CLAYEY SILT WITH SAND
3.00	CLAYEY SILT WITH SAND
3.50	CLAYEY SILT WITH SAND
4.50	CLAYEY SILT WITH SAND
5.00	SILT SAND
6.00	SILT SAND
6.50	CLAYEY SILT WITH SAND
7.00	CLAYEY SILT WITH SAND
8.00	SILT SAND WITH CLAY
10.0	SILT SAND
12.00	SILT SAND
13.0	CLAYEY SILT WITH SAND
15.00	CLAYEY SILT WITH SAND
16.00	CLAYEY SILT WITH SAND

**HYDROLOGICAL DATA**

ITEM NO.	DESCRIPTION	PERMANENT	TEMPORARY	PERMANENT	TEMPORARY
1	...	...	...	...	...
2	...	...	...	...	...
3	...	...	...	...	...
4	...	...	...	...	...
5	...	...	...	...	...
6	...	...	...	...	...
7	...	...	...	...	...
8	...	...	...	...	...
9	...	...	...	...	...
10	...	...	...	...	...

**NOTE:**

The soil is to be tested for the purpose of determining the bearing capacity of the soil. The soil is to be tested for the purpose of determining the bearing capacity of the soil. The soil is to be tested for the purpose of determining the bearing capacity of the soil.

**GENERAL ARRANGEMENT DRAWING**  
**BRIDGE AT PROPOSED CH. 11+407**  
**(GANIJANGA BRIDGE)**

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

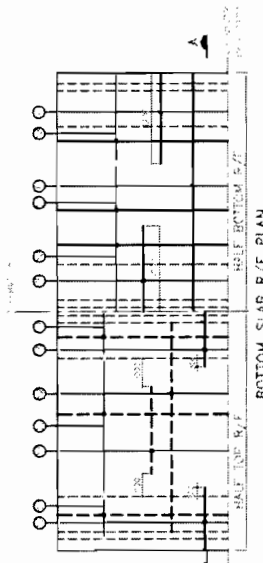
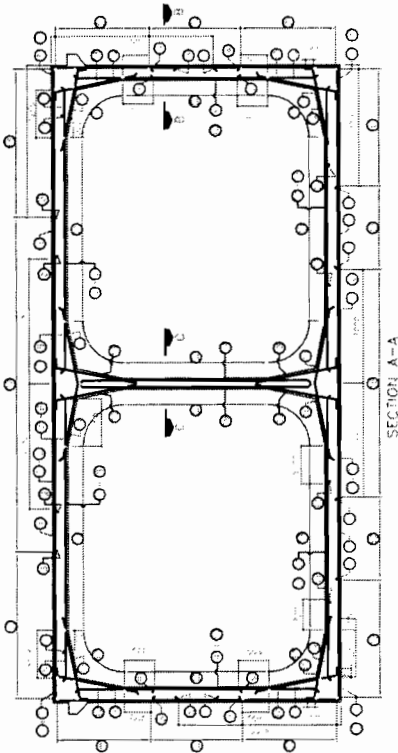
**CONSULTING ENGINEERS GROUP LTD.**  
 E-12, 1st Colony, New Market, Bhubaneswar-751005  
 Tel: 2520134, 2520135, 2520136, 2520137  
 Fax: 2520134, 2520135, 2520136, 2520137

**REVISIONS**

NO.	DESCRIPTION	DATE
1	...	...
2	...	...
3	...	...
4	...	...
5	...	...
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7	...	...
8	...	...
9	...	...
10	...	...

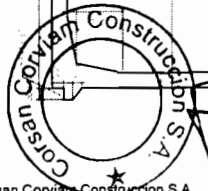
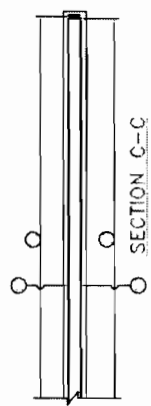
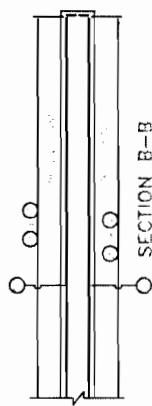
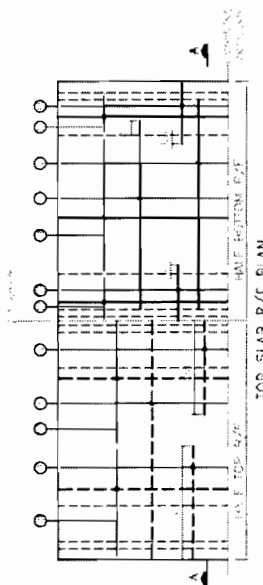
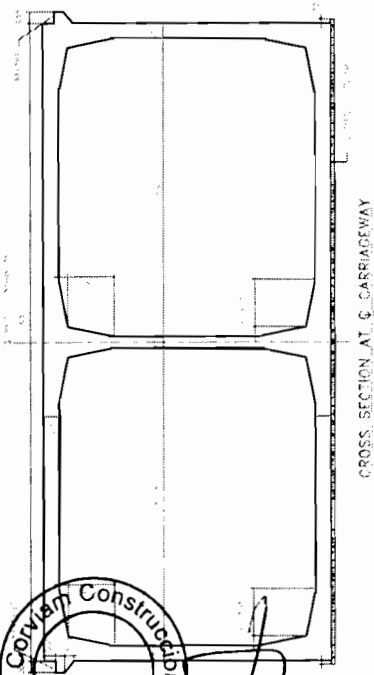
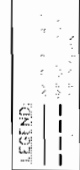
NOTES:  
 1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.  
 2. ALL REINFORCEMENT SHALL BE AS PER IS: 456-1978 (REV. 2003).  
 3. ALL REINFORCEMENT SHALL BE PROVIDED AS PER THE DRAWINGS.  
 4. ALL REINFORCEMENT SHALL BE PROVIDED AS PER THE DRAWINGS.  
 5. ALL REINFORCEMENT SHALL BE PROVIDED AS PER THE DRAWINGS.  
 6. ALL REINFORCEMENT SHALL BE PROVIDED AS PER THE DRAWINGS.  
 7. ALL REINFORCEMENT SHALL BE PROVIDED AS PER THE DRAWINGS.  
 8. ALL REINFORCEMENT SHALL BE PROVIDED AS PER THE DRAWINGS.  
 9. ALL REINFORCEMENT SHALL BE PROVIDED AS PER THE DRAWINGS.  
 10. ALL REINFORCEMENT SHALL BE PROVIDED AS PER THE DRAWINGS.

REFERENCE DRAWINGS:



REINFORCEMENT DETAILS

BAR NO	BAR DIA	GRADE	SHAPE
1	12	Fe 415	[Symbol]
2	12	Fe 415	[Symbol]
3	12	Fe 415	[Symbol]
4	12	Fe 415	[Symbol]
5	12	Fe 415	[Symbol]
6	12	Fe 415	[Symbol]
7	12	Fe 415	[Symbol]
8	12	Fe 415	[Symbol]
9	12	Fe 415	[Symbol]
10	12	Fe 415	[Symbol]
11	12	Fe 415	[Symbol]
12	12	Fe 415	[Symbol]
13	12	Fe 415	[Symbol]
14	12	Fe 415	[Symbol]
15	12	Fe 415	[Symbol]
16	12	Fe 415	[Symbol]
17	12	Fe 415	[Symbol]
18	12	Fe 415	[Symbol]
19	12	Fe 415	[Symbol]
20	12	Fe 415	[Symbol]
21	12	Fe 415	[Symbol]
22	12	Fe 415	[Symbol]
23	12	Fe 415	[Symbol]
24	12	Fe 415	[Symbol]
25	12	Fe 415	[Symbol]
26	12	Fe 415	[Symbol]
27	12	Fe 415	[Symbol]
28	12	Fe 415	[Symbol]
29	12	Fe 415	[Symbol]
30	12	Fe 415	[Symbol]



Corsan Corviam Construction S.A.  
 Contractor

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

**DIMENSION AND REINFORCEMENT DETAILS**  
**BRIDGE AT PROPOSED CH. 11+407**  
**(GANJANGA BRIDGE)**

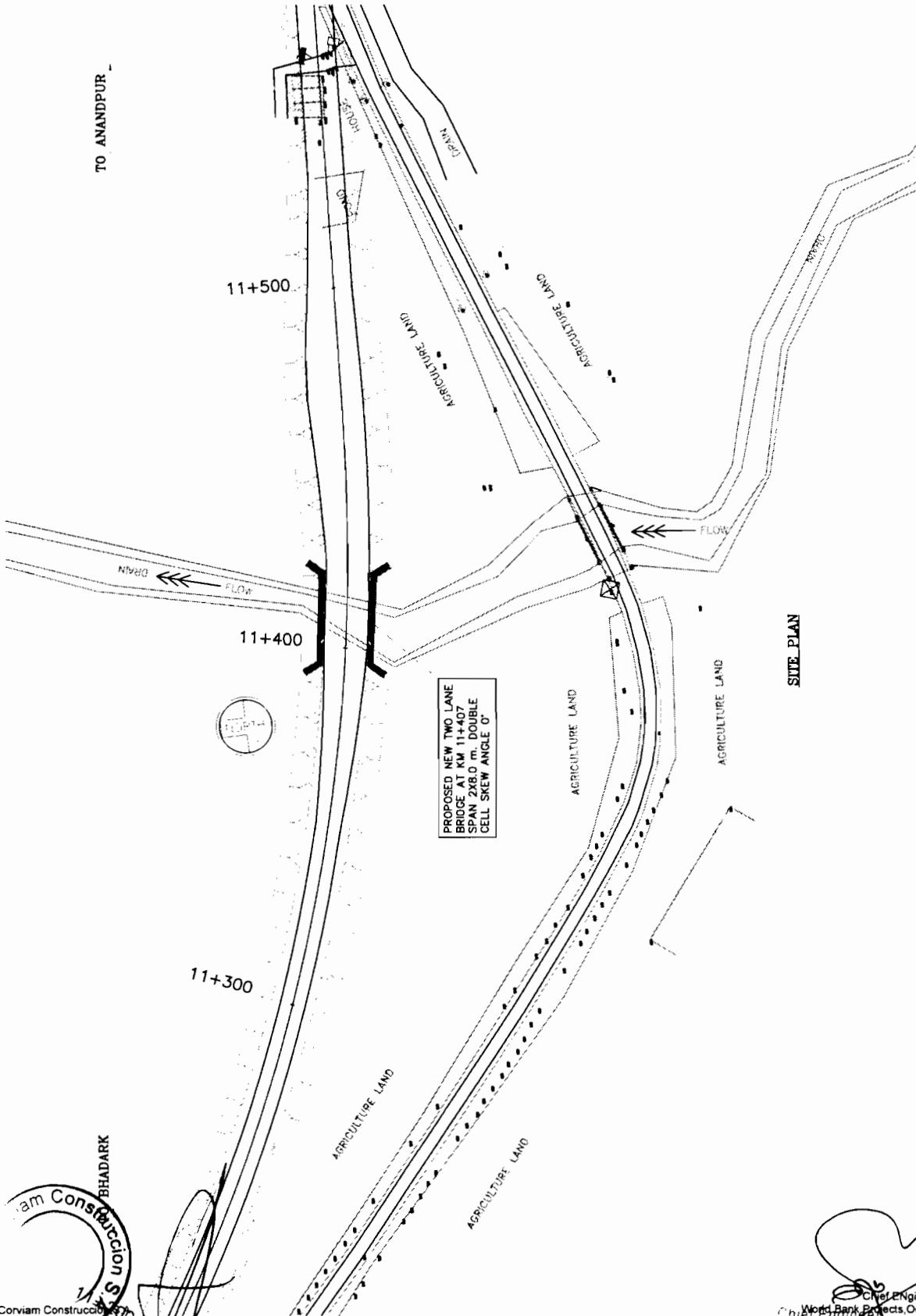
NO.	DATE	BY	CHECKED BY	APPROVED BY
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002	01/01/2011	...	...	...
003	01/01/2011	...	...	...
004	01/01/2011	...	...	...
005	01/01/2011	...	...	...

ODISHA STATE ROAD PROJECT  
 UNDER WORLD BANK ASSISTANCE

**CONSULTING ENGINEERS GROUP LTD.**  
 E-12, 1st Floor, Market, Bhubaneswar-751005  
 Tel: 2331344, 2331345, 2331346  
 Fax: 2331344, 2331345, 2331346

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

NOTES:-



DESIGNED NO. :	0007/2004/200-02/00/11/000/00
SCALE :	AS SHOWN
DATE :	03.09.07
DESIGNED BY :	CS
CHECKED BY :	CS
APPROVED BY :	CS

SITE PLAN  
BRIDGE AT PROPOSED CH. 11+407  
(GANJANGA BRIDGE)

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

CONSULTING  
ENGINEERS GROUP LTD.  
Plot No. 17, Sector 17, Phase 1, Indraprastha Extension, New Delhi-110028  
Tel: +91-11-2610208, 2610209, 2610210, 2610211  
Fax: 2610212, E-mail: enginfo@egpltd.com

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

**Corviam Construction**  
BHADARK  
Contractor

**NOTES:**

1. The bridge is to be constructed on the existing ground level. The ground level is to be as shown in the plan and section drawings. The bridge is to be constructed on the existing ground level. The ground level is to be as shown in the plan and section drawings. The bridge is to be constructed on the existing ground level. The ground level is to be as shown in the plan and section drawings.

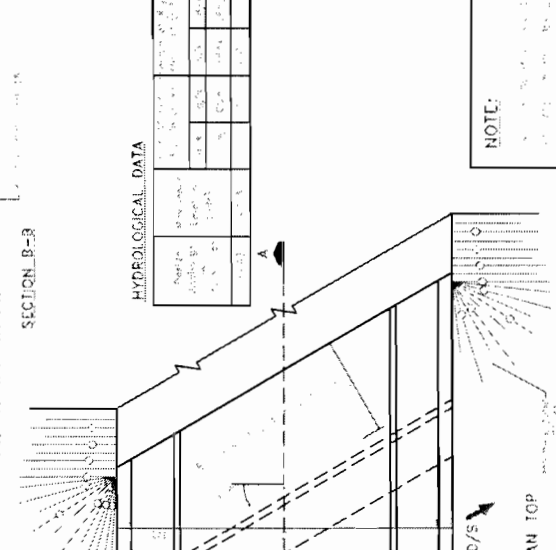
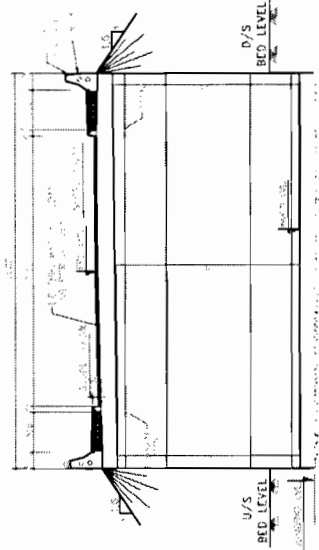
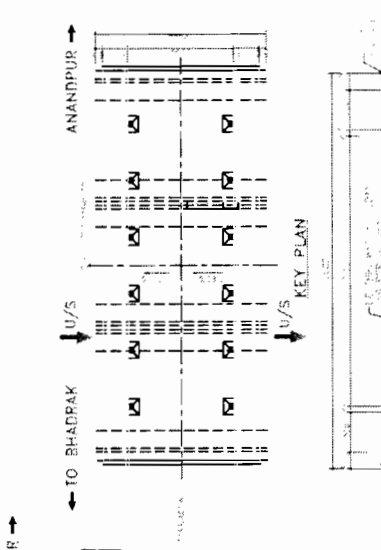
**REFERENCE DRAWINGS**

**LOCATION PLAN OF BORE HOLE AT BRIDGE NO. 17/270**

0.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00
11.25/7	CLAYEY SILT WITH SAND	CLAYEY SILT WITH SAND	CLAYEY SILT WITH SAND	CLAYEY SILT WITH SAND	SILT SAND WITH CLAY	SILT SAND WITH CLAY	SILT SAND WITH CLAY	SILT SAND WITH CLAY	SILT SAND WITH CLAY	SILT SAND WITH CLAY	CLAYEY SILT WITH SAND	CLAYEY SILT WITH SAND	CLAYEY SILT WITH SAND	CLAYEY SILT WITH SAND

**BOX LEVELS DETAILS**

Particulars	Span	Span	Span	Span	Span	Span	Span	Span	Span	Span	Span	Span	Span	Span	Span	Span	Span	Span	Span
Span	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Span	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Span	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

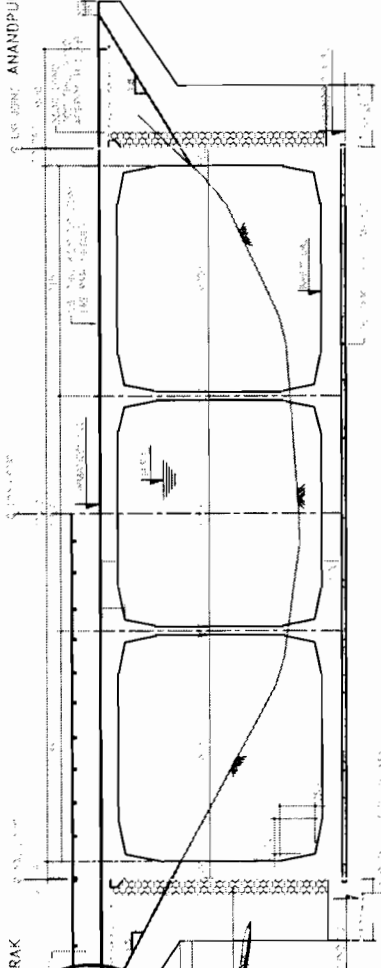


**HYDROLOGICAL DATA**

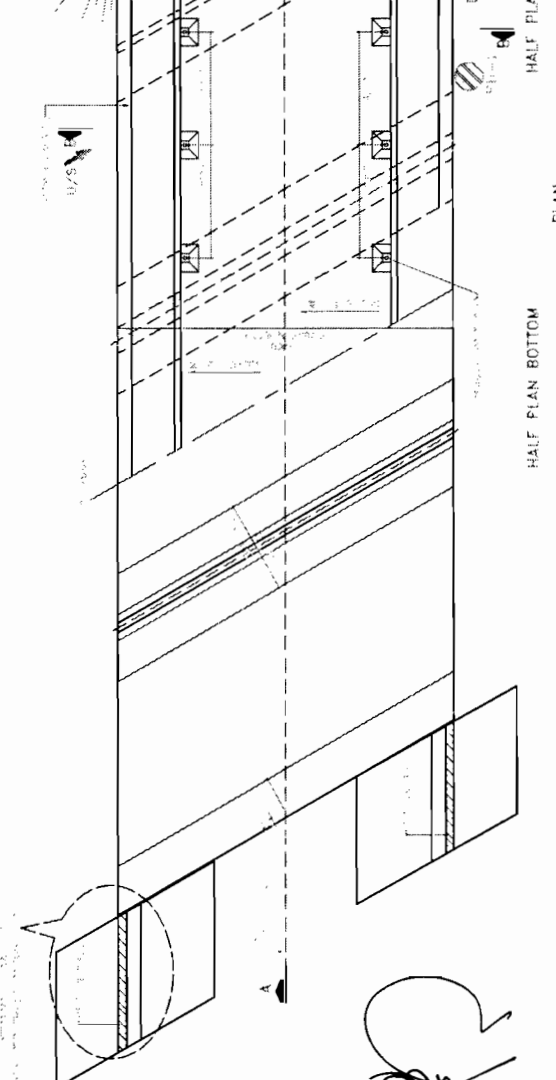
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Span	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Span	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

**NOTE:**

The bridge is to be constructed on the existing ground level. The ground level is to be as shown in the plan and section drawings. The bridge is to be constructed on the existing ground level. The ground level is to be as shown in the plan and section drawings.



Span	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Span	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Span	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19



**GENERAL ARRANGEMENT DRAWING**  
**BRIDGE AT PROPOSED CH. 17+275**  
**(TILLO POLO KAPALI RIVER)**

Drawn by: ...  
 Date: ...  
 Checked by: ...  
 Approved by: ...

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

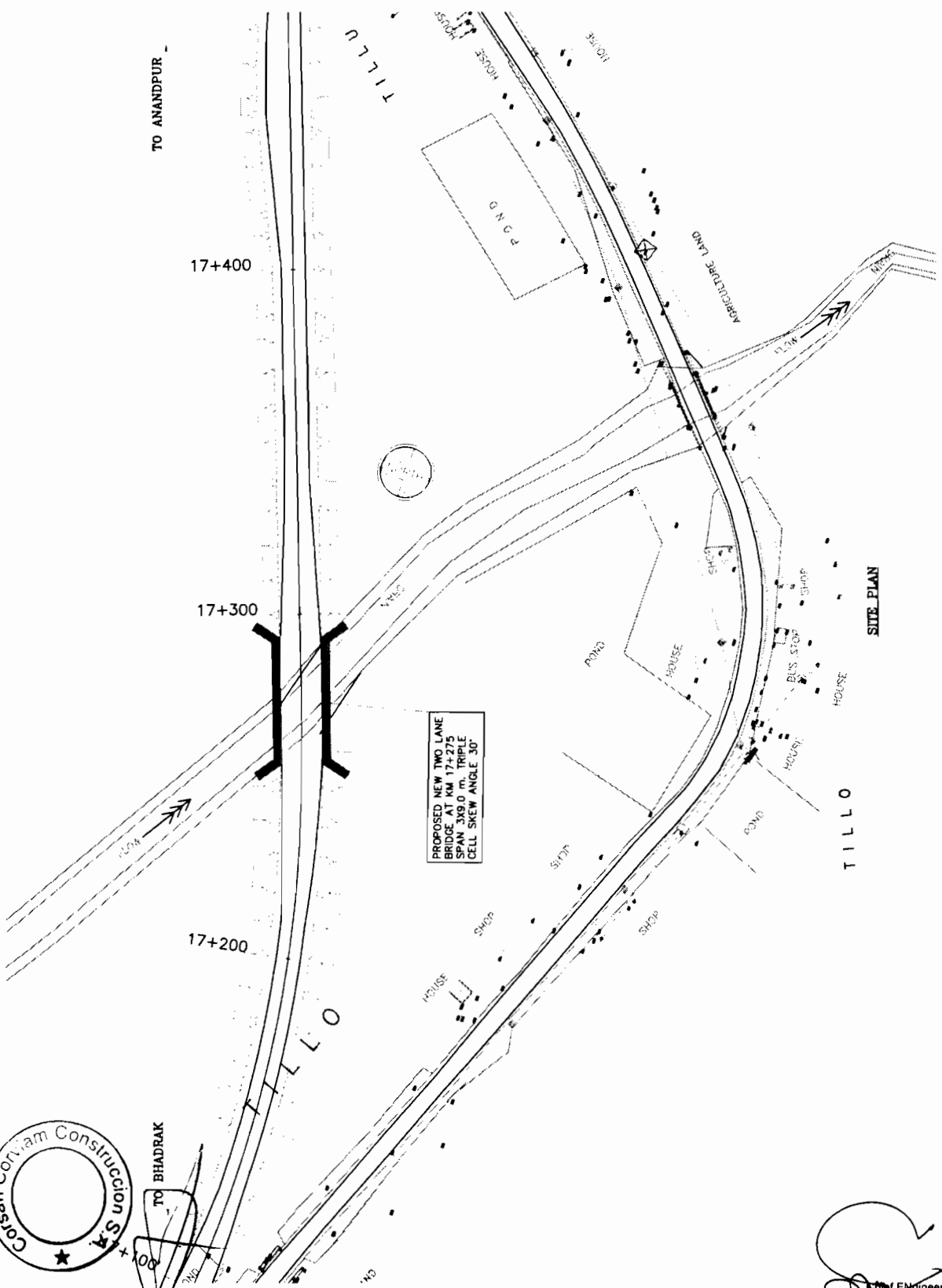
**CONSULTING ENGINEERS GROUP LTD.**  
 E-12/403 Colony, Bhubaneswar, Odisha - 751017  
 Tel: 481-141-2520859, 2521659, 2520356  
 Fax: 2521345, e-mail: eng@ogpltd.com

**Contractor**  
**sa Corviam Construction**

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



NOTES:-



PROPOSED NEW TWO LANE  
BRIDGE AT KM 17+275  
SPAN 3X9.0 m. TRIPLE  
CELL SKEW ANGLE 30°

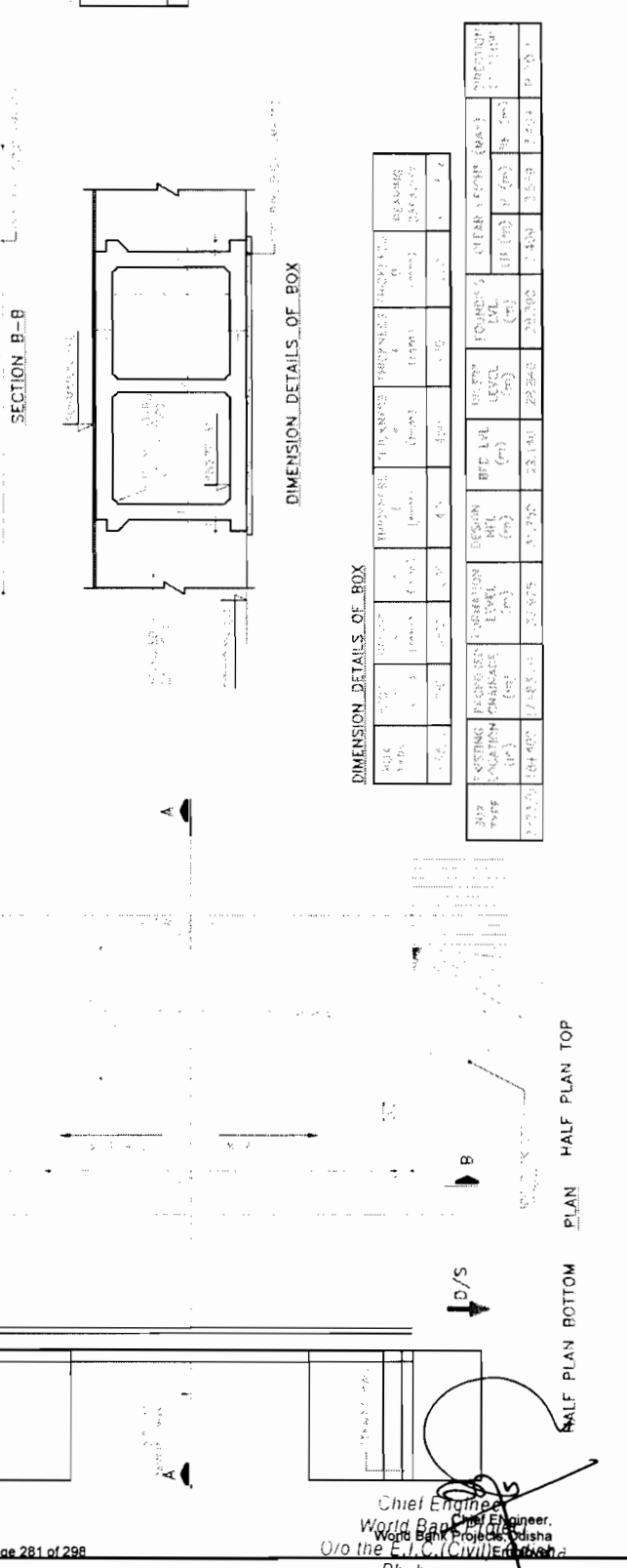
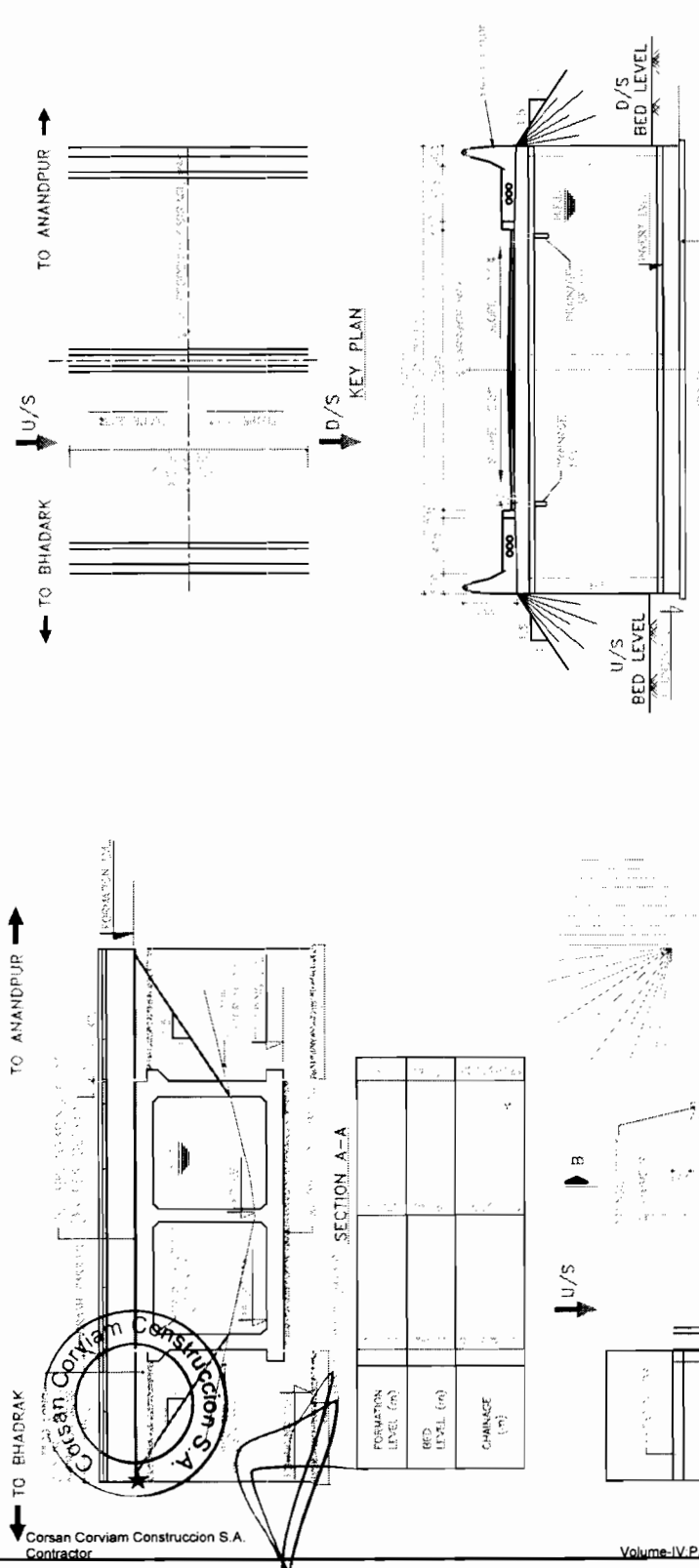
<p>CONSULTING ENGINEERS GROUP LTD. E-12, Midy Colony, Bhubaneswar, Odisha-751006 Ph: 2571148, F: 2571149, 2571150</p>		<p>PROJECT: ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE</p>		<p>SITE PLAN BRIDGE AT PROPOSED CH. 17+275 (TILLO POLO KAPALI RIVER)</p>		<p>DATE: 17/05/2017</p>
<p>DESIGNED BY: [Signature]</p>	<p>CHECKED BY: [Signature]</p>	<p>DATE: 17/05/2017</p>	<p>SCALE: 1:1000</p>	<p>NO. OF SHEETS: 1</p>	<p>TOTAL SHEETS: 1</p>	<p>DATE: 17/05/2017</p>

**NOTES:**

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
2. THE BRIDGE SHALL BE CONSTRUCTED ON THE EXISTING GROUND LEVEL.
3. THE BRIDGE SHALL BE CONSTRUCTED ON THE EXISTING GROUND LEVEL.
4. THE BRIDGE SHALL BE CONSTRUCTED ON THE EXISTING GROUND LEVEL.
5. THE BRIDGE SHALL BE CONSTRUCTED ON THE EXISTING GROUND LEVEL.
6. THE BRIDGE SHALL BE CONSTRUCTED ON THE EXISTING GROUND LEVEL.
7. THE BRIDGE SHALL BE CONSTRUCTED ON THE EXISTING GROUND LEVEL.
8. THE BRIDGE SHALL BE CONSTRUCTED ON THE EXISTING GROUND LEVEL.
9. THE BRIDGE SHALL BE CONSTRUCTED ON THE EXISTING GROUND LEVEL.
10. THE BRIDGE SHALL BE CONSTRUCTED ON THE EXISTING GROUND LEVEL.

**REFERENCE DRAWING:-**

1. ROAD BRIDGE AT MALSAH POLO, DISTRICT BALASOR, ODISHA.
2. ROAD BRIDGE AT MALSAH POLO, DISTRICT BALASOR, ODISHA.
3. ROAD BRIDGE AT MALSAH POLO, DISTRICT BALASOR, ODISHA.
4. ROAD BRIDGE AT MALSAH POLO, DISTRICT BALASOR, ODISHA.



**HYDROLOGICAL DATA**

ITEM	UNIT	VALUE	REMARKS
1. DESIGN FLOOD	m <sup>3</sup> /s	100.00	
2. DESIGN FLOOD PERIOD	YEAR	100	
3. DESIGN FLOOD VELOCITY	m/s	1.00	
4. DESIGN FLOOD WAVELENGTH	m	100.00	
5. DESIGN FLOOD FREQUENCY	1/100		
6. DESIGN FLOOD RETURN PERIOD	YEAR	100	
7. DESIGN FLOOD PROBABILITIES	PERCENT	1.00	
8. DESIGN FLOOD RISK	PERCENT	1.00	
9. DESIGN FLOOD DAMAGE	PERCENT	1.00	
10. DESIGN FLOOD LOSS	PERCENT	1.00	
11. DESIGN FLOOD COST	PERCENT	1.00	
12. DESIGN FLOOD BENEFIT	PERCENT	1.00	
13. DESIGN FLOOD NET BENEFIT	PERCENT	1.00	
14. DESIGN FLOOD ECONOMIC BENEFIT	PERCENT	1.00	
15. DESIGN FLOOD ECONOMIC LOSS	PERCENT	1.00	
16. DESIGN FLOOD ECONOMIC NET BENEFIT	PERCENT	1.00	
17. DESIGN FLOOD ECONOMIC RISK	PERCENT	1.00	
18. DESIGN FLOOD ECONOMIC DAMAGE	PERCENT	1.00	
19. DESIGN FLOOD ECONOMIC LOSS	PERCENT	1.00	
20. DESIGN FLOOD ECONOMIC NET BENEFIT	PERCENT	1.00	

**GENERAL ARRANGEMENT DRAWING**

**BRIDGE AT PROPOSED CH. 17+650 (MALSAH POLO)**

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

**CONSULTING ENGINEERS GROUP LTD.**  
 E-1240/3 Colony, Malabar Nagar, Bhubaneswar-751017  
 Tel: 491-151-2520859, 2521859, 2520255  
 Fax: 2521348, e-mail: ceg@ceggroup.com

**CEG**

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

HALF PLAN BOTTOM PLAN HALF PLAN TOP

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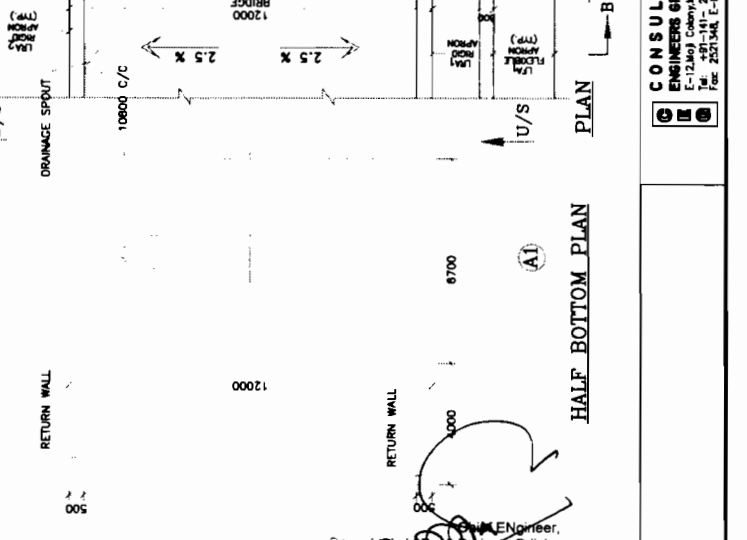
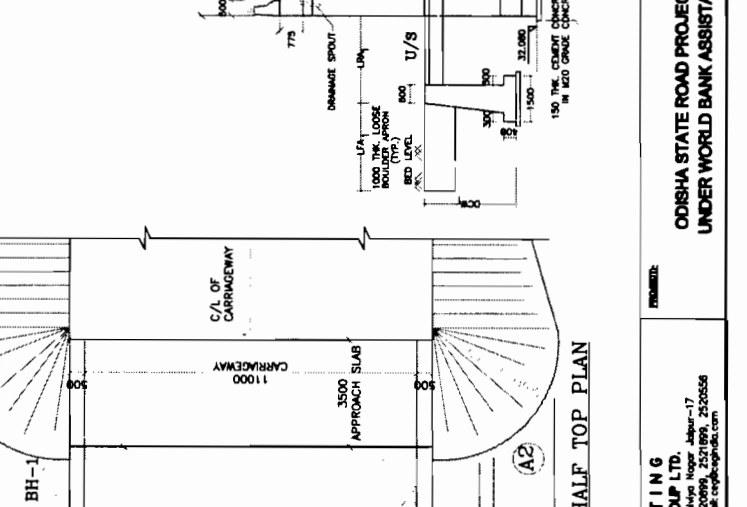
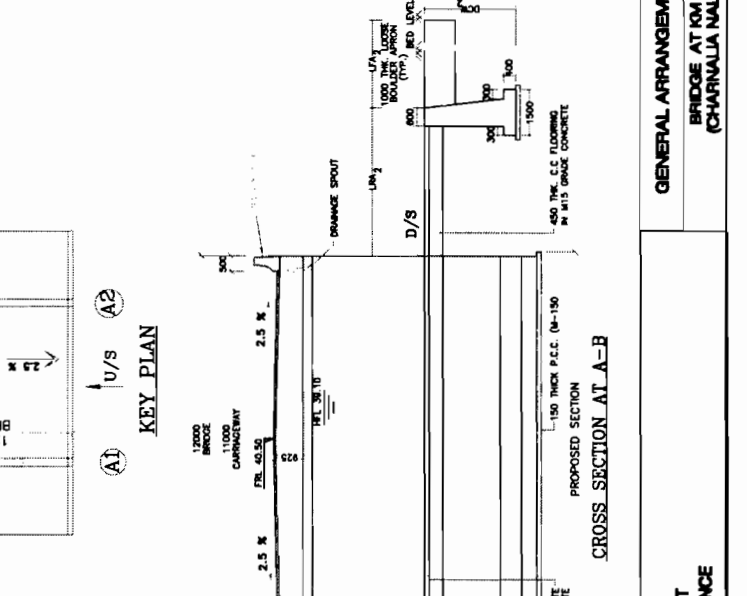
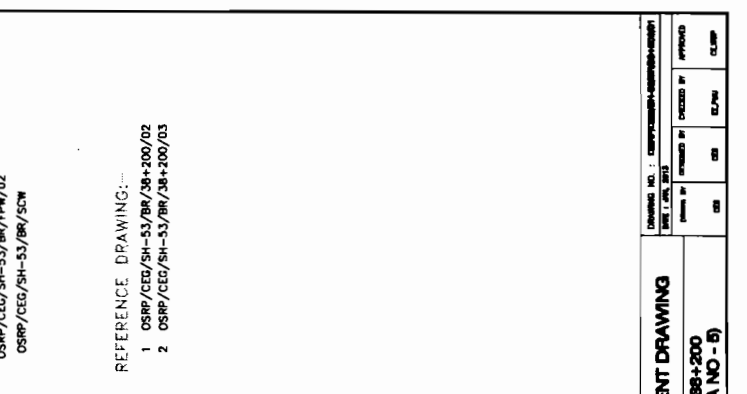
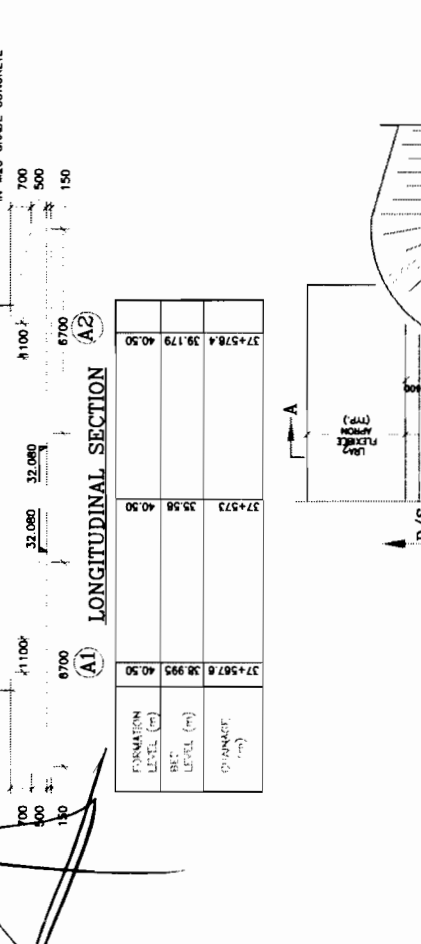
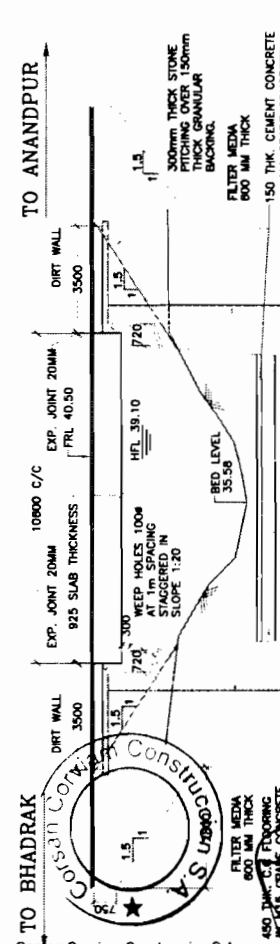
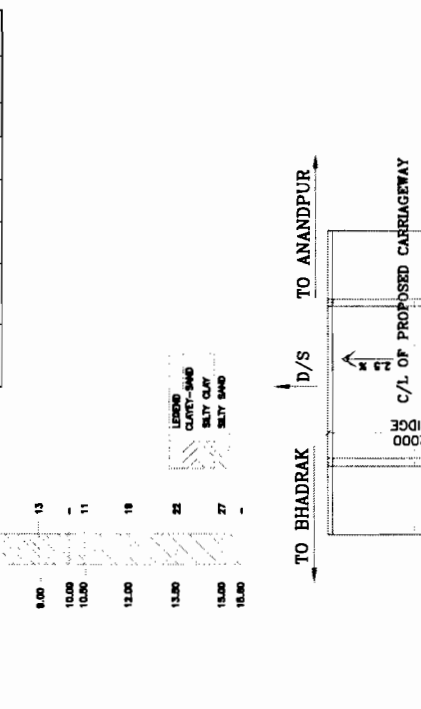
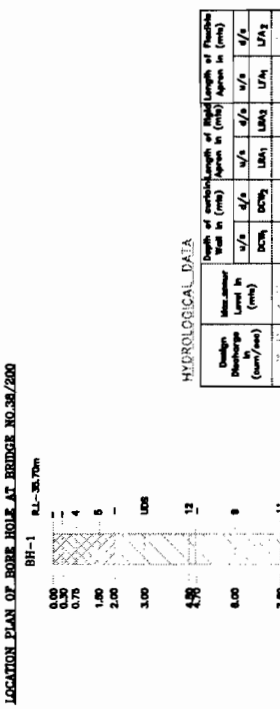


**NOTES:-**

- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED. LEVELS ARE IN METRES.
- DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
- THE GROSS SAFE BEARING CAPACITY OF SOIL AT THE PROPOSED FOUNDATION OF THE ABUTMENTS, RETURN WALL IN NO CASE BE LESS THAN 20.0 T/M<sup>2</sup>.
- GRADE OF CONCRETE :  
 OPEN FOUNDATION - M-25  
 ABUTMENT/ABUTMENT CAP - M-25  
 DIRT WALL - M-25  
 APPROACH SLAB - M-30  
 SOLID SLAB - M-30  
 CRASH BARRIER - M-40  
 RETURN WALL - M-25  
 P.C.C. LEAN CONC. - M-15
- REINFORCEMENT H.Y.S.D. BARS IS CONFORM TO IS:1786 GRADE - Fe-500.
- FOR DETAIL OF CRASH BARRIER REFER DECARATE DRAWING.
- TAR PAPER BEARING SHALL BE USED.
- THE SUPER STRUCTURE REFER MOST STANDARD DRAWING FOR ROAD BRIDGES FOR R.C.C. SOLID SLAB STRUCTURE DRG. NO. SD/114
- THE BRIDGE HAS BEEN DESIGNED FOR 70R (M) + CLASS A AND 3 LANES OF I.R.C. CLASS-A VEHICLE WHICH EVER WILL PRODUCE THE WORST EFFECT.
- ADEQUATE NOS. OF WEEP HOLES SHALL BE PROVIDED IN THE ABUTMENT & RETURN WALL AS PER I.R.C. SPECIFICATION.
- BACK FILL PARAMETERS ASSUMED ARE C-O & # 30.
- CLEAR COVER TO ANY REINFORCEMENT = 75mm IN BASE SLAB  
 IN ALL OTHER COMPONENTS = 40mm
- FOR DETAIL OF BED PROTECTION REFER DRAWING NO. OSRP/CEG/SH-53/BR/38+200/02  
 OSRP/CEG/SH-53/BR/38+200/03

REFERENCE DRAWING:-

- OSRP/CEG/SH-53/BR/38+200/02
- OSRP/CEG/SH-53/BR/38+200/03



Corsan Corviam Construction S.A. Contractor

Volume IV, Page 283 of 298

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

ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE

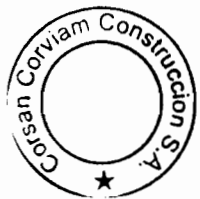
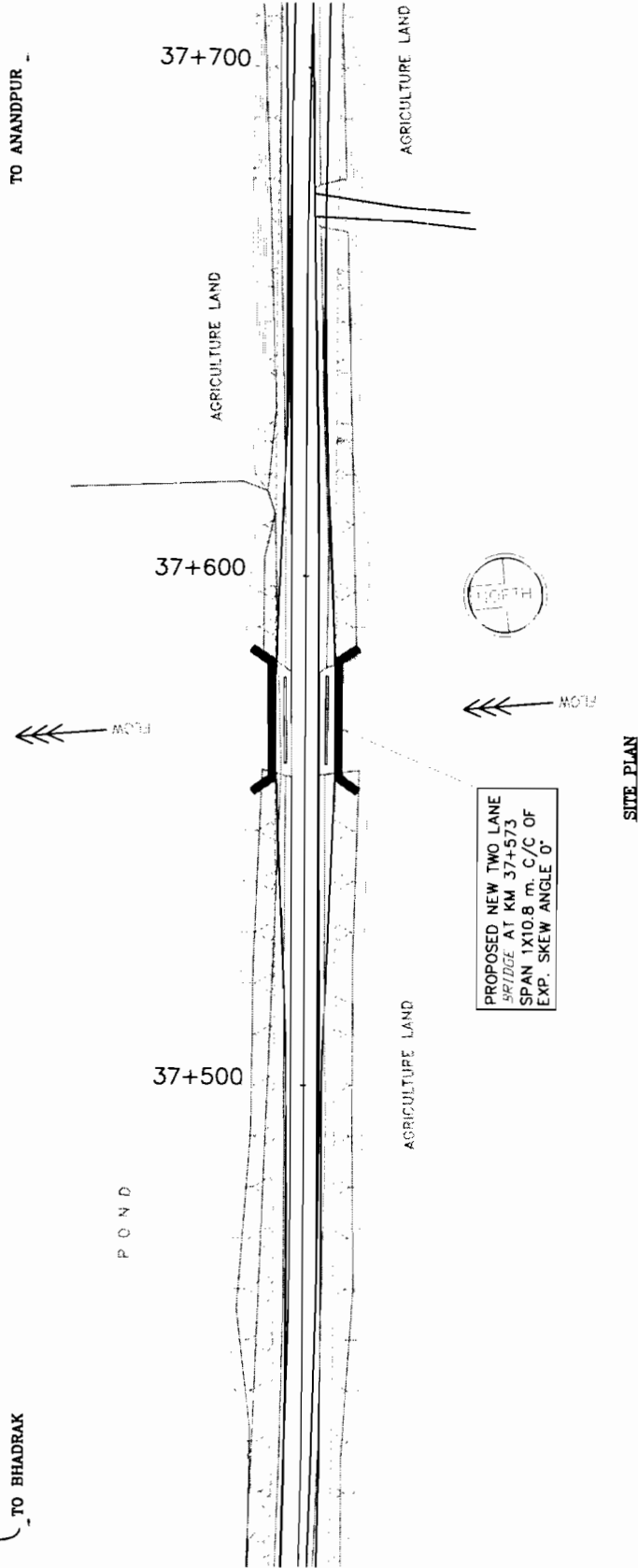
GENERAL ARRANGEMENT DRAWING BRIDGE AT KM 38+200 (CHARNALA NALA NO - 5)

ENGINEERS GROUP LTD. E-12, Mid Colony, Mahave Nagar, Jaipur-17. Ph: +91-141-252099, 252189, 252056 Fax: 252194, E-mail: cce@engineersgroup.com

APPROVED BY: [Signature]



NOTES:-



Corsan Corviam Construccion S.A.  
Contractor

Chief Engineer,  
World Bank Project  
On the E.I.C. (Civil), Odisha  
Employer

APPROVED	DATE	BY

SITE PLAN  
BRIDGE AT KM 38+200  
(CHARNALIA NALA NO - 5)

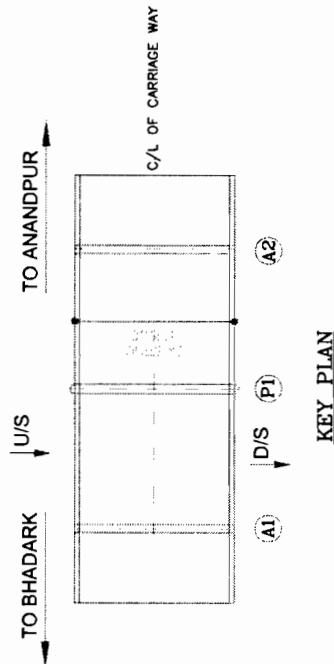
PROJECT: CONSULTANCY SERVICES FOR FEASIBILITY STUDY AND DETAILED PROJECT PREPARATION OF PHASE - (I) ROADS FOR ORISSA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE

CONSULTING ENGINEERS GROUP LTD.  
17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100  
Tel: 2071348, 2071349, 2071350, 2071351, 2071352, 2071353, 2071354, 2071355, 2071356, 2071357, 2071358, 2071359, 2071360  
Fax: 2071348, E-Mail: info@cgpltd.com

Chief Engineer,  
World Bank Project  
On the E.I.C. (Civil), Odisha  
Employer

NOTES:

EXISTING BRIDGE DETAILS		
1	Changeage	19/00
2	Name of the rail/ah	Banna Canal
3	Year of construction	1975
4	Type of bridge	High level Bridge
5	Existin./ span arrangement	2 x 6.3 m
6	Existing carriage way width	7.0 m
7	Thickness of superstructure	0.525 m
8	Type of foundation	Open foundation
9	Type of substructure	RR stone masonry wall type
10	Type of superstructure	RCC solid slab
11	Existing Formation Level	32.68 m
12	Proposed Formation Level	32.68 m
13	Bed Level	30.61 m
14	Distance of P.C.I. w.r.t E.C.L	1.1 m Left
REHABILITATION MEASURES SUGGESTED		
S. no.	Items	Reference Drawings
1	Superstructure As per NDT result the slab to be dismantled and new slab shall be constructed	MOST STANDARD DRAWINGS FOR ROAD BRIDGES, S.D/110 (Proposed carriage way width modified to 8.0 m)
2	Crash barrier	OSRP CEG/BR/MISC-02
3	Expansion joint	OSRP CEG/BR/MISC-02
4	Wearing coat	OSRP CEG/BR/MISC-02
5	Drainage spout	OSRP CEG/BR/MISC-02
6	Bearing	-
7	Approach slab	OSRP CEG/BR/MISC-02



*[Handwritten signature]*

*[Handwritten signature]*

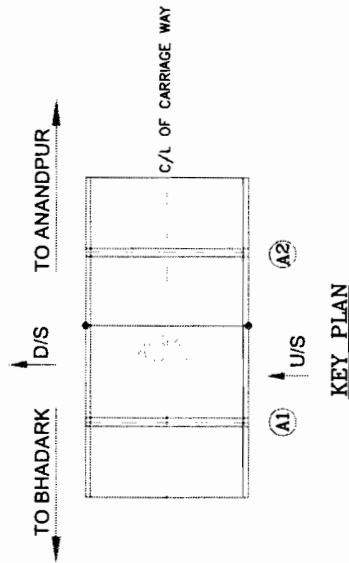
<p>PROJECT NO. : OMR/CEG/BR-03/BR/19-200/01</p> <p>DATE : 24.06.2013</p> <p>DESIGNED BY : CEG</p> <p>CHECKED BY : CEG</p> <p>APPROVED BY : CEG</p>	<p>REHABILITATION BRIDGE DETAILS</p>
	<p>BRIDGE AT KM. 19+300</p>
<p>ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE</p>	<p>CONSULTING ENGINEERS GROUP LTD E-72, 1st Floor, Market, New Market, Cuttack Tel. : 91-674-252098, 252099, 252056 Fax : 91-674-252142, e-mail : ceg@cegroup.com</p>

NOTES:

EXISTING BRIDGE DETAILS	
1	Chainage 30950
2	Name of the nallah Tirdigh Canal Syphone
3	Year of construction 1960
4	Type of bridge Syphone
5	Existing span arrangement 1 x 5.5
6	Existing carriage way width 9.3 m
7	Thickness of superstructure
8	Type of foundation RR stone masonry
9	Type of substructure
10	Type of superstructure
11	Existing Formation Level 41.38 m
12	Proposed Formation Level 41.38 m
13	Bed Level 38.75 m
14	Distance of PCL w.r.t ECL 0.36 m Right

REHABILITATION MEASURES SUGGESTED		Reference Drawings
S. no.	Items	
1	Railing to be reconstructed (40.0 m)	MOST STANDARD SHEET OF CURVERTS NO. 300/15 (SHEET 1 OF 4), SD 11.5 (SIUPT 2 OF 4)
2	Wearing coat Existing wearing coat shall be dismantled and 50mm BC laid over 6mm thick mastic asphalt shall be laid newly	OSRP/CEG/BB/MISC-02
3	Expansion joint Asphaltic plug type expansion joint be provided shall	OSRP/CEG/BB/MISC-02
4	Vegetation growth Vegetation to be removed from the structure	



Corsan Corviam Construcción S.A.  
Contractor

*[Handwritten signature]*

*[Handwritten signature]*  
Chief Engineer,  
World Bank Project, Odisha  
World Bank Project  
in the E.I.C.(Civil), Odisha  
Bhubaneswar.

CONSULTING ENGINEERS GROUP LTD.  
P-24, 1st Colony, Airport, Bhubaneswar - 751017  
Ph: 421-141-2533/2534, 2521/2522/2525  
Fax: 2521361 E-mail: cege@cegeindia.com

ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

REHABILITATION BRIDGE DETAILS  
BRIDGE AT KM. 30+950

SHEET NO. : 009/200/79-03/08/20-000/01	DATE : 20.01.2011	DESIGNED BY	CHECKED BY	APPROVED
		DATE	DATE	DATE

**NOTES:**

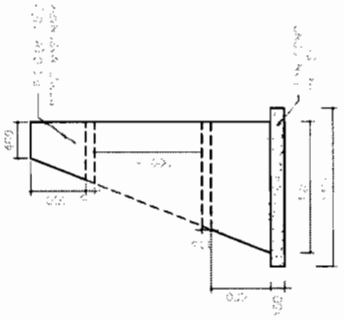
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.

2. THE STRUCTURE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE SPECIFICATIONS AND STANDARDS OF THE ROAD DEPARTMENT, GOVT. OF ODISHA.

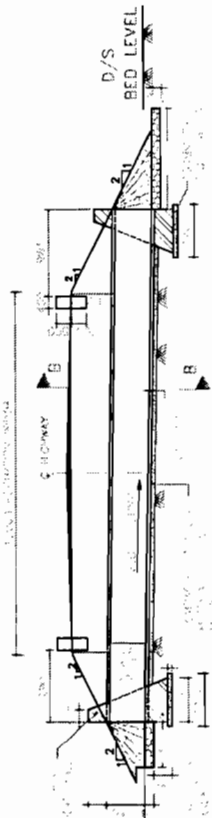
3. THE STRUCTURE SHALL BE CONSTRUCTED WITH 150mm THICK REINFORCED CONCRETE WALLS AND 150mm THICK REINFORCED CONCRETE SLABS.

4. THE STRUCTURE SHALL BE CONSTRUCTED WITH 150mm THICK REINFORCED CONCRETE WALLS AND 150mm THICK REINFORCED CONCRETE SLABS.

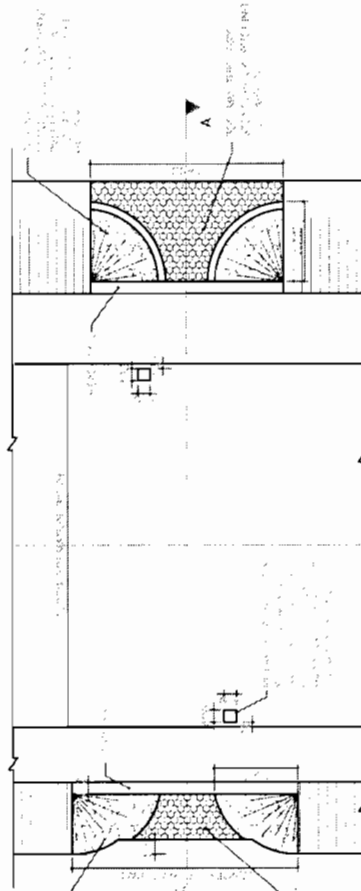
5. THE STRUCTURE SHALL BE CONSTRUCTED WITH 150mm THICK REINFORCED CONCRETE WALLS AND 150mm THICK REINFORCED CONCRETE SLABS.



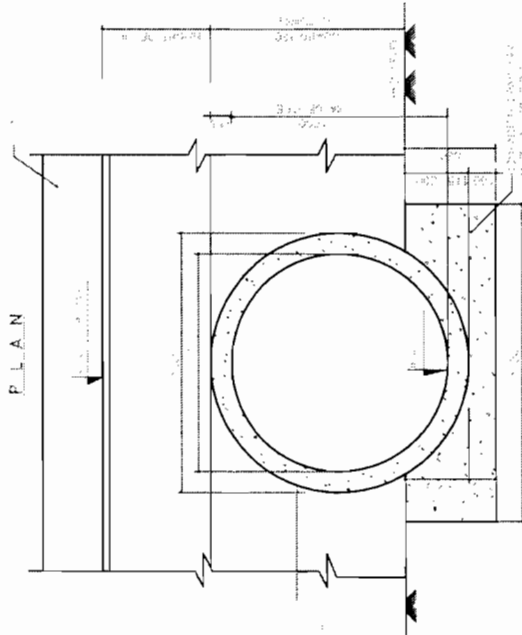
DETAIL OF HEAD WALL



SECTION A-A



SECTION B-B



PLAN

**SINGLE PIPE CULVERTS LEVEL DETAIL**

Sl. No.	Location	Proposed Chainage	Proposed Formation Level	Bed level		Camber/Invert Elevation		Height of Fill (M)		LWT	RWI	Direction of flow	Total Length	No. of Pipes
				Left	Right	Left	Right	Left	Right					
1	12/200	11869	26.46	25.19	24.87	-2.5%	-2.5%	0.7	0.6	1.3	1.3	R.TOL	14.6	6
2	13/110	12809	27.36	25.96	25.96	8.1%	-5.7%	1.0	0.9	1.9	1.9	R.TOL	15.6	65
3	13/600	13507	27.60	26.57	26.16	-2.5%	-2.5%	0.7	0.7	1.4	1.3	R.TOL	14.7	6
4	19/600	18444	32.05	30.31	30.31	1.23%	-2.5%	1.0	1.0	2.1	2.0	R.TOL	16.1	65
5	19/850	18486	32.05	30.30	30.30	-2.5%	-2.5%	0.8	0.8	1.6	1.6	R.TOL	15.2	6
6	20/100	19696	33.56	32.06	31.66	-0.2%	-2.50%	0.9	0.9	1.8	1.7	R.TOL	15.6	6
7	20/500	20645	36.26	34.84	34.84	-2.5%	-2.5%	0.4	0.4	0.7	0.7	R.TOL	13.5	55
8	20/200	27733	36.97	37.32	37.32	-2.5%	-2.5%	0.7	0.7	1.4	1.4	R.TOL	14.8	6
9	29/650	29159	40.77	39.20	39.33	-2.5%	0.8%	0.6	0.6	1.3	1.2	R.TOL	14.5	6
10	29/700	29250	40.82	39.10	39.25	-2.5%	-2.5%	0.8	0.8	1.6	1.5	R.TOL	15.1	6
11	31/600	31484	42.18	40.52	40.52	-2.5%	-2.5%	0.7	0.7	1.4	1.4	R.TOL	14.9	6
12	31/600	31484	42.18	40.52	40.52	-2.5%	-2.5%	0.7	0.7	1.4	1.4	R.TOL	14.9	6
13	35/700	34935	44.15	42.18	42.28	-2.5%	-2.5%	1.0	1.0	2.0	2.1	L.TOR	16.1	65

**TYPICAL ARRANGEMENT**

**FOR R.O.O SINGLE PIPE CULVERTS (1.0m DIA)**  
**(HEIGHT OF FILL VARYING FROM 0.6 TO 4.0 M)**

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

---

**CONSULTING ENGINEERS GROUP LTD.**  
E-12(a) Colony, Mahapalpur, Bhubaneswar-751005  
Ph: 2521341, 2521342, 2521343  
Fax: 2521344, 2521345, 2521346  
E-mail: ceg@cegroup.co.in

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**Contractor:** Corsan Corviam Construction S.A.

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**Project:** Odisha State Road Project Under World Bank Assistance

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**Checked by:** [Signature] **Checked by:** [Signature]

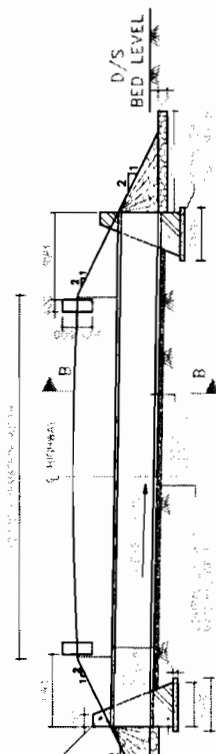
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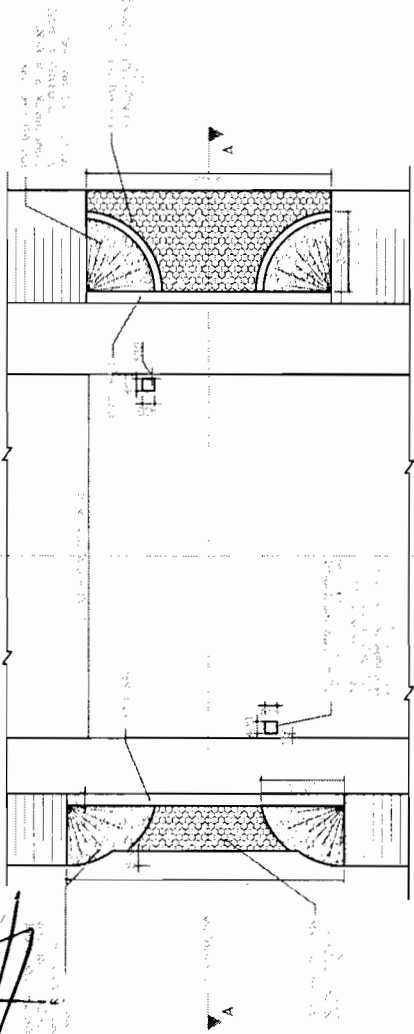


Corsen Corviam Construction S.A.  
Contractor

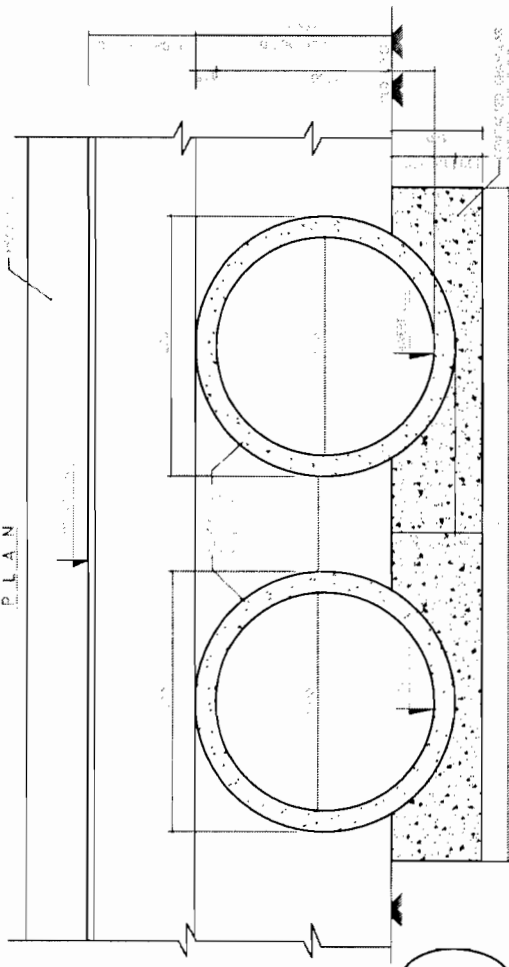
Chief Engineer,  
Water Resources, Odisha  
On the E.I.C.(Civil), Odisha  
Bhubaneswar.



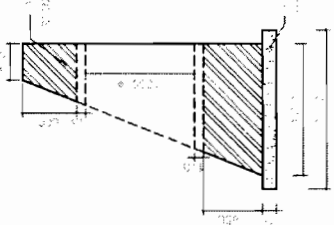
SECTION A-A



PLAN



SECTION B-B



DETAIL OF HEAD WALL

NOTES:

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
2. THE STRUCTURE SHALL BE CONSTRUCTED AS PER THE DETAILS GIVEN HEREIN.
3. THE STRUCTURE SHALL BE CONSTRUCTED WITH R.C.C. WORK.
4. THE STRUCTURE SHALL BE CONSTRUCTED WITH 150mm DIA. REINFORCING BARS.
5. THE STRUCTURE SHALL BE CONSTRUCTED WITH 150mm DIA. REINFORCING BARS.
6. THE STRUCTURE SHALL BE CONSTRUCTED WITH 150mm DIA. REINFORCING BARS.
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20. THE STRUCTURE SHALL BE CONSTRUCTED WITH 150mm DIA. REINFORCING BARS.
21. THE STRUCTURE SHALL BE CONSTRUCTED WITH 150mm DIA. REINFORCING BARS.
22. THE STRUCTURE SHALL BE CONSTRUCTED WITH 150mm DIA. REINFORCING BARS.

DOUBLE PIPE CULVERTS, LEVEL DETAIL

Stn Location	Proposed Chaisage	Proposed Formation Level		Bed level		Camber/Super Elevation		Height of Fill		Direction of flow	Total Length	No. of Pipes
		Left	Right	Left	Right	Left	Right	Left	Right			
1	6800	6675	23.82	21.93	21.93	-2.5%	-2.5%	0.9	1.0	1.9	1.9	13
2	8300	8488	24.84	23.00	23.00	-4.1%	4.1%	0.8	0.8	1.6	1.6	12
3	18700	18261	32.06	31.00	30.42	7.0%	-7.0%	1.3	1.3	2.5	2.5	14
4	19250	18902	32.68	31.09	31.09	-2.5%	-2.5%	0.7	0.6	1.3	1.3	12
5	20600	20426	33.30	31.32	31.32	-4.8%	4.8%	1.0	1.0	2.0	2.0	14
6	21750	21024	34.26	32.35	32.36	-2.5%	-2.5%	1.0	1.0	1.9	1.9	13
7	23600	22784	35.52	33.69	33.26	-2.5%	-2.45%	1.3	1.3	2.6	2.6	14
8	24150	23700	36.23	34.28	33.29	-2.5%	-2.5%	2.0	2.0	4.0	4.0	16
9	24700	24205	36.61	35.17	33.40	-2.5%	-2.5%	2.3	2.3	4.5	4.5	17
10	24750	24375	36.74	35.76	34.74	-2.5%	-2.5%	1.1	1.1	2.1	2.1	13
11	25710	25265	37.57	36.13	36.29	-2.5%	-3.0%	0.9	0.9	1.8	1.8	13
12	25990	25571	38.14	36.62	36.71	3.0%	-2.5%	1.0	1.0	1.9	1.9	13
13	26450	26025	37.88	36.13	36.29	-2.5%	-2.5%	0.8	0.8	1.6	1.6	12.5
14	27100	26689	38.28	37.98	36.58	-2.5%	-2.5%	0.8	0.8	1.6	1.6	12
15	28950	28531	39.98	38.24	38.30	-2.5%	-2.5%	0.8	0.7	1.5	1.5	12
16	29100	28684	40.12	38.66	38.52	-2.5%	-2.5%	0.7	0.6	1.3	1.3	12
17	31100	30684	41.54	40.97	40.02	-2.5%	-2.5%	0.6	0.6	1.2	1.1	11.5
18	31800	31353	41.93	40.61	40.71	-2.5%	-2.5%	0.7	0.7	1.4	1.3	12
19	32200	31776	42.32	40.62	40.84	-2.5%	-2.5%	0.8	0.8	1.5	1.5	12
20	32400	32108	42.37	40.67	41.95	-2.5%	-2.5%	0.8	0.8	1.5	1.5	12
21	33050	32528	42.54	40.72	40.84	-2.5%	-2.5%	0.9	0.9	1.8	1.7	12
22	33450	32964	43.22	41.65	41.63	-2.5%	-2.5%	0.6	0.6	1.3	1.3	12.5

DOUBLE PIPE CULVERT - ADDITIONAL

Stn Location	Proposed Chaisage	Proposed Formation Level		Bed Level		Camber/Super Elevation		Direction of flow	
		Left	Right	Left	Right	Left	Right	Left	Right
1	1010	1185	21.17	18.38	18.72	-2.5%	-2.5%	R.TOL	R.TOL
2	10800	2010	21.75	18.52	18.06	-2.5%	-2.5%	R.TOL	R.TOL
3	11500	20600	22.48	19.10	18.54	-2.5%	-2.5%	R.TOL	R.TOL
4	12100	20804	22.48	19.10	20.46	-2.5%	-2.5%	R.TOL	R.TOL
5	117000	17002	30.94	29.16	29.20	-2.5%	-2.5%	R.TOL	R.TOL
6	117000	17123	31.87	29.59	29.59	-2.5%	-2.5%	R.TOL	R.TOL
7	20825	20825	32.89	31.85	31.85	-2.5%	-2.5%	R.TOL	R.TOL
8	31500	31087	42.03	38.83	38.83	-2.5%	-2.5%	R.TOL	R.TOL
9	35000	35281	42.33	40.30	40.11	-2.5%	-2.5%	L.TOR	L.TOR
11	40500	39857	40.89	38.41	37.98	-2.5%	-2.5%	R.TOL	R.TOL
12	40850	40317	40.31	38.31	38.52	-2.5%	-2.5%	R.TOL	R.TOL

Particulars

**CONSULTING ENGINEERS GROUP LTD.**  
E-12, Raj Cakraborty Nagar, Jobber-17  
Sector-10, Vasant Vihar, New Delhi-110056  
Ph: 2611144, E-mail: ceg@cegroup.com



ODISHA STATE ROAD PROJECT  
UNDER WORLD BANK ASSISTANCE

TYPICAL ARRANGEMENT  
FOR R.C.C DOUBLE PIPE CULVERTS (1.0m DIA)  
(HEIGHT OF FILL VARYING FROM 0.6 TO 4.0 M)

APPROVED BY: [Signature]  
DATE: [Date]  
DESIGNED BY: [Signature]  
CHECKED BY: [Signature]  
SCALE: [Scale]

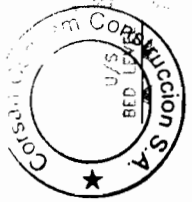
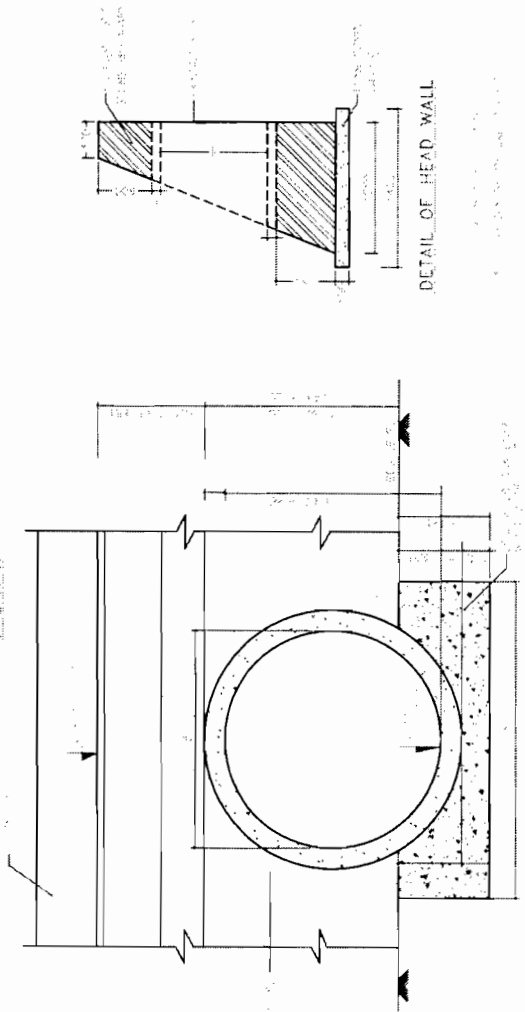
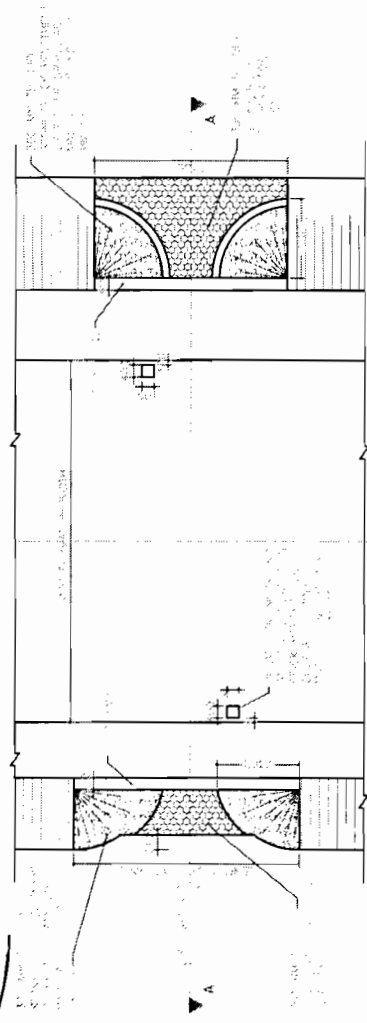
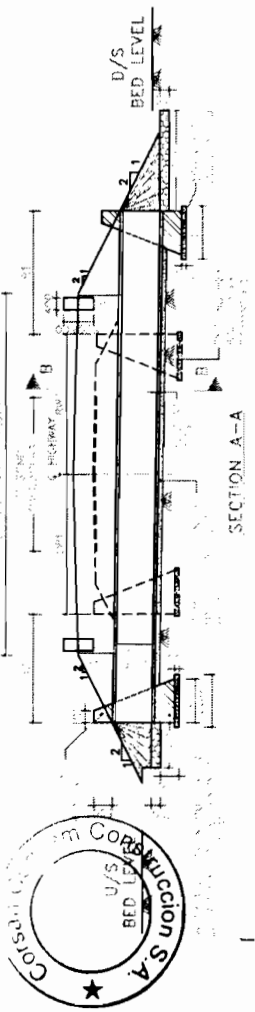


**NOTES:**

1. The structure shall be constructed as per the details shown in the drawings.
2. The structure shall be constructed as per the details shown in the drawings.
3. The structure shall be constructed as per the details shown in the drawings.
4. The structure shall be constructed as per the details shown in the drawings.
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7. The structure shall be constructed as per the details shown in the drawings.
8. The structure shall be constructed as per the details shown in the drawings.
9. The structure shall be constructed as per the details shown in the drawings.
10. The structure shall be constructed as per the details shown in the drawings.

**PIPE CULVERTS LEVEL DETAIL (WIDENING CASES)**

Sl. No.	Particulars	Quantity	Unit
1	Concrete	1.20	m <sup>3</sup>
2	Reinforcement	1.20	m <sup>3</sup>
3	Backfill	1.20	m <sup>3</sup>
4	Formwork	1.20	m <sup>2</sup>
5	Labour	1.20	m <sup>3</sup>
6	Excavation	1.20	m <sup>3</sup>
7	Foundation	1.20	m <sup>3</sup>
8	Structure	1.20	m <sup>3</sup>
9	Backfill	1.20	m <sup>3</sup>
10	Formwork	1.20	m <sup>2</sup>
11	Labour	1.20	m <sup>3</sup>
12	Excavation	1.20	m <sup>3</sup>
13	Foundation	1.20	m <sup>3</sup>
14	Structure	1.20	m <sup>3</sup>
15	Backfill	1.20	m <sup>3</sup>
16	Formwork	1.20	m <sup>2</sup>
17	Labour	1.20	m <sup>3</sup>
18	Excavation	1.20	m <sup>3</sup>
19	Foundation	1.20	m <sup>3</sup>
20	Structure	1.20	m <sup>3</sup>
21	Backfill	1.20	m <sup>3</sup>
22	Formwork	1.20	m <sup>2</sup>
23	Labour	1.20	m <sup>3</sup>
24	Excavation	1.20	m <sup>3</sup>
25	Foundation	1.20	m <sup>3</sup>
26	Structure	1.20	m <sup>3</sup>
27	Backfill	1.20	m <sup>3</sup>
28	Formwork	1.20	m <sup>2</sup>
29	Labour	1.20	m <sup>3</sup>
30	Excavation	1.20	m <sup>3</sup>
31	Foundation	1.20	m <sup>3</sup>
32	Structure	1.20	m <sup>3</sup>
33	Backfill	1.20	m <sup>3</sup>
34	Formwork	1.20	m <sup>2</sup>
35	Labour	1.20	m <sup>3</sup>
36	Excavation	1.20	m <sup>3</sup>
37	Foundation	1.20	m <sup>3</sup>
38	Structure	1.20	m <sup>3</sup>
39	Backfill	1.20	m <sup>3</sup>
40	Formwork	1.20	m <sup>2</sup>
41	Labour	1.20	m <sup>3</sup>
42	Excavation	1.20	m <sup>3</sup>
43	Foundation	1.20	m <sup>3</sup>
44	Structure	1.20	m <sup>3</sup>
45	Backfill	1.20	m <sup>3</sup>
46	Formwork	1.20	m <sup>2</sup>
47	Labour	1.20	m <sup>3</sup>
48	Excavation	1.20	m <sup>3</sup>
49	Foundation	1.20	m <sup>3</sup>
50	Structure	1.20	m <sup>3</sup>
51	Backfill	1.20	m <sup>3</sup>
52	Formwork	1.20	m <sup>2</sup>
53	Labour	1.20	m <sup>3</sup>
54	Excavation	1.20	m <sup>3</sup>
55	Foundation	1.20	m <sup>3</sup>
56	Structure	1.20	m <sup>3</sup>
57	Backfill	1.20	m <sup>3</sup>
58	Formwork	1.20	m <sup>2</sup>
59	Labour	1.20	m <sup>3</sup>
60	Excavation	1.20	m <sup>3</sup>
61	Foundation	1.20	m <sup>3</sup>
62	Structure	1.20	m <sup>3</sup>
63	Backfill	1.20	m <sup>3</sup>
64	Formwork	1.20	m <sup>2</sup>
65	Labour	1.20	m <sup>3</sup>
66	Excavation	1.20	m <sup>3</sup>
67	Foundation	1.20	m <sup>3</sup>
68	Structure	1.20	m <sup>3</sup>
69	Backfill	1.20	m <sup>3</sup>
70	Formwork	1.20	m <sup>2</sup>
71	Labour	1.20	m <sup>3</sup>
72	Excavation	1.20	m <sup>3</sup>
73	Foundation	1.20	m <sup>3</sup>
74	Structure	1.20	m <sup>3</sup>
75	Backfill	1.20	m <sup>3</sup>
76	Formwork	1.20	m <sup>2</sup>
77	Labour	1.20	m <sup>3</sup>
78	Excavation	1.20	m <sup>3</sup>
79	Foundation	1.20	m <sup>3</sup>
80	Structure	1.20	m <sup>3</sup>
81	Backfill	1.20	m <sup>3</sup>
82	Formwork	1.20	m <sup>2</sup>
83	Labour	1.20	m <sup>3</sup>
84	Excavation	1.20	m <sup>3</sup>
85	Foundation	1.20	m <sup>3</sup>
86	Structure	1.20	m <sup>3</sup>
87	Backfill	1.20	m <sup>3</sup>
88	Formwork	1.20	m <sup>2</sup>
89	Labour	1.20	m <sup>3</sup>
90	Excavation	1.20	m <sup>3</sup>
91	Foundation	1.20	m <sup>3</sup>
92	Structure	1.20	m <sup>3</sup>
93	Backfill	1.20	m <sup>3</sup>
94	Formwork	1.20	m <sup>2</sup>
95	Labour	1.20	m <sup>3</sup>
96	Excavation	1.20	m <sup>3</sup>
97	Foundation	1.20	m <sup>3</sup>
98	Structure	1.20	m <sup>3</sup>
99	Backfill	1.20	m <sup>3</sup>
100	Formwork	1.20	m <sup>2</sup>



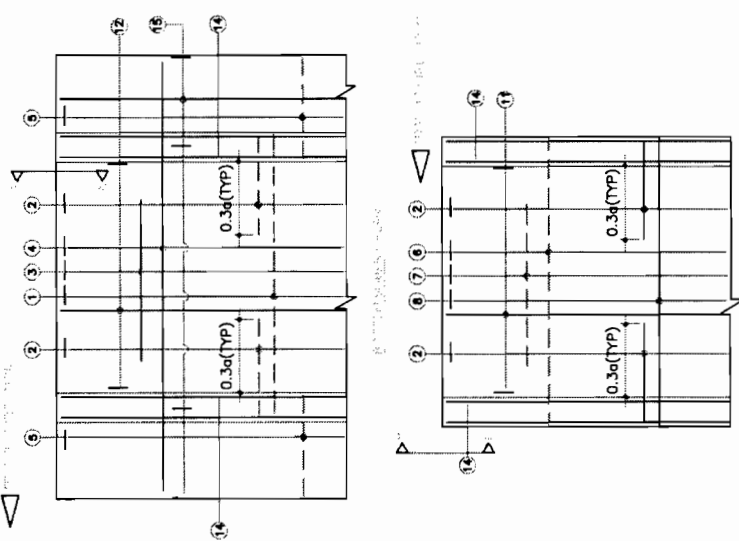
Checked by: *[Signature]*  
 World Bank Project  
 O/o the E.I.C. (Civil), Odisha  
 Bhubaneswar.

<b>CONSULTING ENGINEERS GROUP LTD.</b> E-13, May Colony, Bhubaneswar, Odisha-751006 Tel: 2511041, 2511042, 2511043 Fax: 2511044, 2511045, 2511046 Email: ceg@ceggroup.com	<b>Project:</b> Odisha State Road Project Under World Bank Assistance	<b>TYPICAL WIDENING ARRANGEMENT</b> FOR R.C.C SINGLE PIPE CULVERTS (1.0m DIA) (HEIGHT OF FILL VARYING FROM 0.6 TO 4.0 M)	Drawn by: <i>[Name]</i>	Scale: <i>[Scale]</i>	Date: <i>[Date]</i>
			Checked by: <i>[Name]</i>	Scale: <i>[Scale]</i>	Date: <i>[Date]</i>

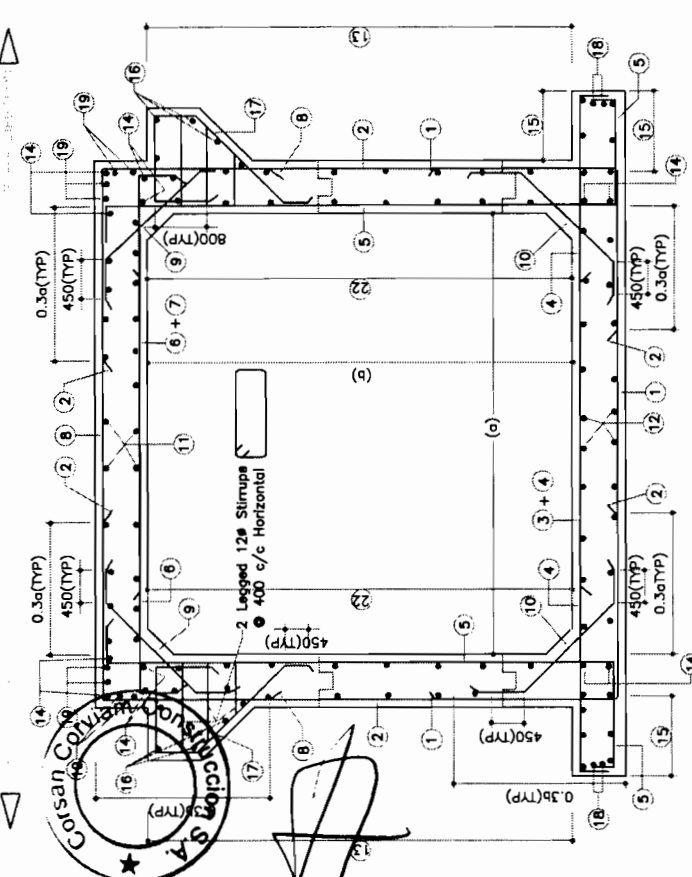


- NOTES :-**
- 1 ALL DIMENSIONS ARE IN MM & LEVELS ARE IN METER.
  - 2 THIS DRAWING SHALL BE READ IN CONJUNCTION WITH Dwg.No.059P/CE/SH-16/ BOX CUL-01
  - 3 MINIMUM CLEAR COVER TO MAIN REINFORCEMENT SHALL BE 40mm.
  - 4 MINIMUM LAP LENGTH OF REINFORCEMENT SHALL BE KEPT AS 83 D WHERE D IS THE DIAMETER 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 STEEL OF GRADE 415 MPa (50 N/mm<sup>2</sup>) CONFORMING TO IS 1786-1983 WITH A MINIMUM YIELD STRENGTH OF 500 N/mm<sup>2</sup>.
  - 10 JOINT OR LAPPING OF BARS SHALL BE SUITABLY STAGGERTED AS PER CLAUSE 304.6 OF IS:21-2000.

REFERENCE DRAWING :-

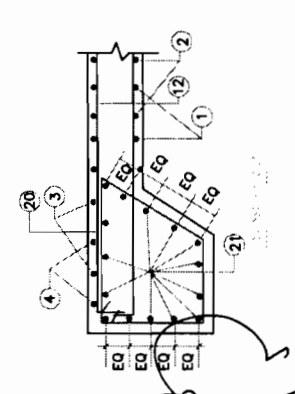
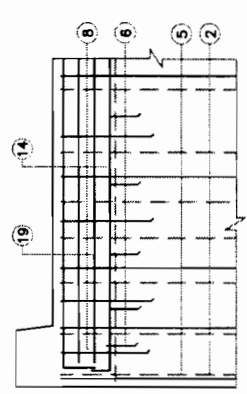


**LEGEND :-**  
 ——— TOP FACE BARS/OUTER FACE BARS.  
 - - - - - BOTTOM FACE BARS/INNER FACE BARS.



Corsan Corviam Construccion S.A.  
 Contractor

BAR SHAPE	1722/0	1723/0	1724/0	1725/0	1726/0	1727/0	1728/0	1729/0	1730/0	1731/0	1732/0	1733/0	1734/0	1735/0	1736/0	1737/0	1738/0	1739/0	1740/0
BAR DIA.	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
SPACING	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250
BAR DIA.	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
SPACING	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250



Chief Engineer  
 World Bank Project Engineer,  
 Oro the E.C.C. (Civil) Engineer  
 Shivaneswar.

**REINFORCEMENT DETAIL OF SINGLE CELL R.C.C. BOX CULVERT**

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

**CONSULTING ENGINEERS GROUP LTD.**  
 E-12, May Colony, Mehrauli, New Delhi-110016  
 Tel. +91-11-2520999, 2521099, 2520056  
 Fax. +91-11-2521044, 2521045, 2521046

**CEG**

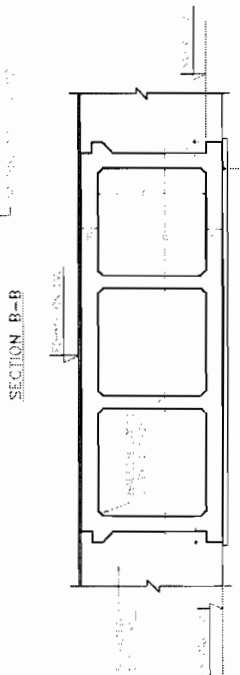
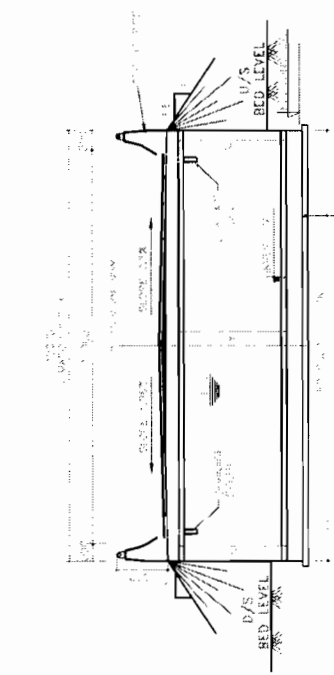
DRAWING NO. : CORSHA-ROAD-BOX CUL-01  
 DATE : 15.01.2011  
 NAME OF :  
 NO. OF :  
 NO. OF :  
 NO. OF :

**NOTES:**

1. GENERAL: TO BE CONSTRUCTED IN ACCORDANCE WITH THE SPECIFICATIONS AND DRAWINGS.
2. THE STRUCTURE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DESIGN AND DIMENSIONS SHOWN IN THE DRAWINGS.
3. THE STRUCTURE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DESIGN AND DIMENSIONS SHOWN IN THE DRAWINGS.
4. THE STRUCTURE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DESIGN AND DIMENSIONS SHOWN IN THE DRAWINGS.

**REFERENCE DRAWING:-**

1. DRAWING NO. ...
2. DRAWING NO. ...
3. DRAWING NO. ...
4. DRAWING NO. ...

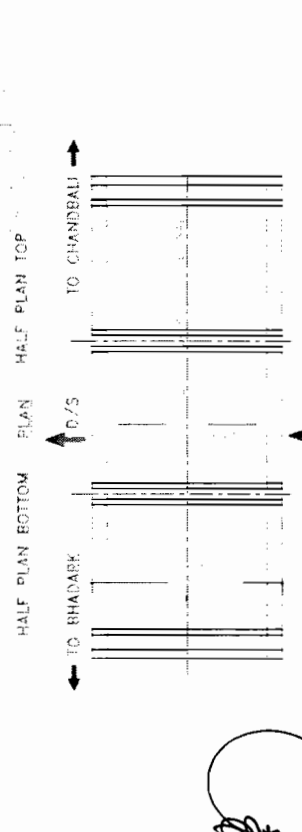
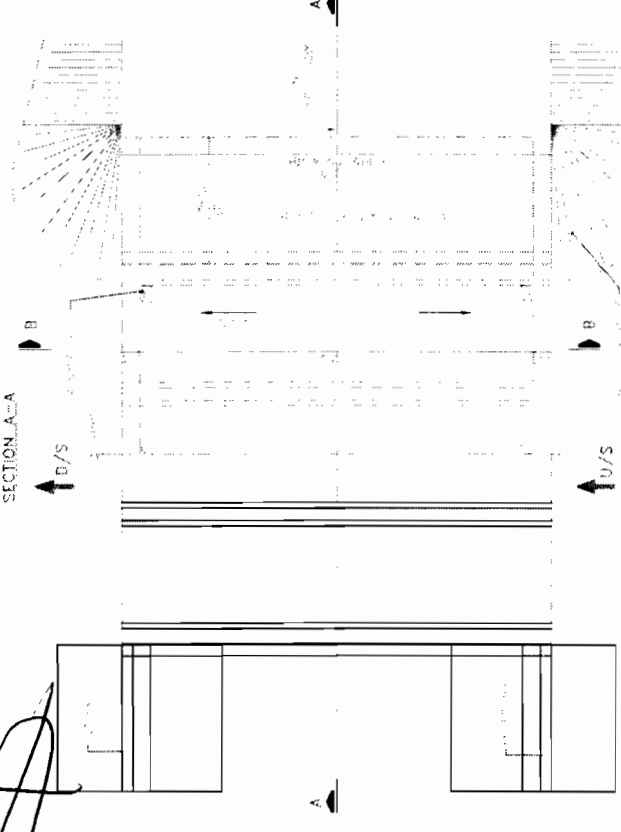
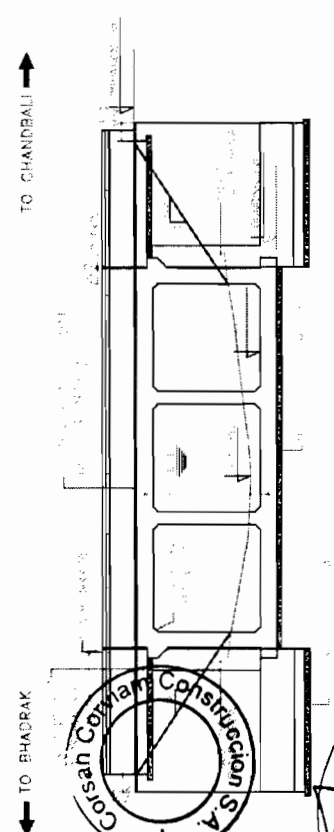


DIMENSION DETAILS OF BOX

BOX TYPE	WIDTH (mm)	HEIGHT (mm)	THICKNESS (mm)	THICKNESS (mm)	THICKNESS (mm)	THICKNESS (mm)	THICKNESS (mm)	BEARING CAPACITY
	a	b	c	d	e	f	g	
1	40290	36870	36070	-2.5	-2.5	36570		
2	36989	40270	35460	-2.5	-2.5	35940		
3	37120	40650	35910	-2.5	-2.5	36410		
4	37276	40830	36280	-2.5	-2.5	35980		

LIST OF PROPOSED BRIDGES OF 3 X 3 M BOX (WITHOUT CUSHION)

Sl. No.	PROPOSED CHAINAGE (m)	FORMATION LEVEL (m)	BED LEVEL (m)	FOUNDING LEVEL (m)	SUPER ELEVATION/ CAMBER	INVERT LEVEL (m)
					LEFT	RIGHT
1	36892	40290	36870	36070	-2.5	-2.5
2	36989	40270	35460	35460	-2.5	-2.5
3	37120	40650	35910	35910	-2.5	-2.5
4	37276	40830	36280	35480	-2.5	-2.5



**Corsan Corviam Construction S.A.**  
 Contractor

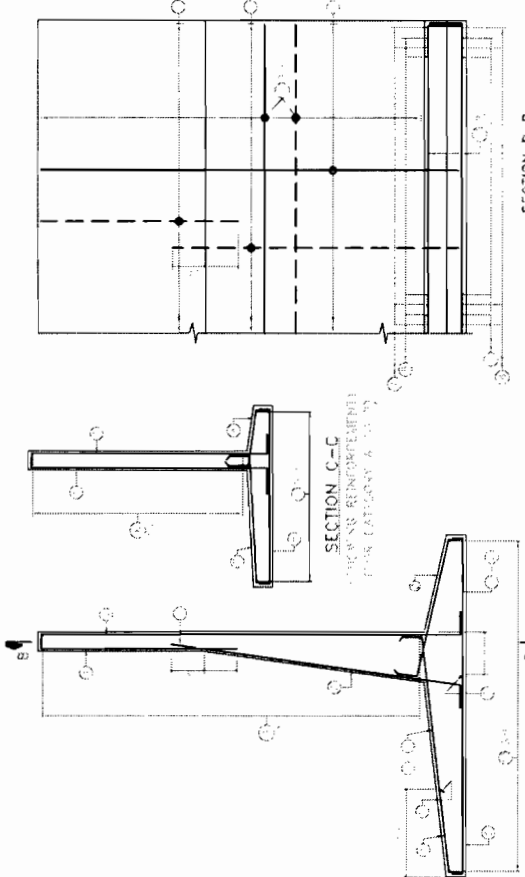
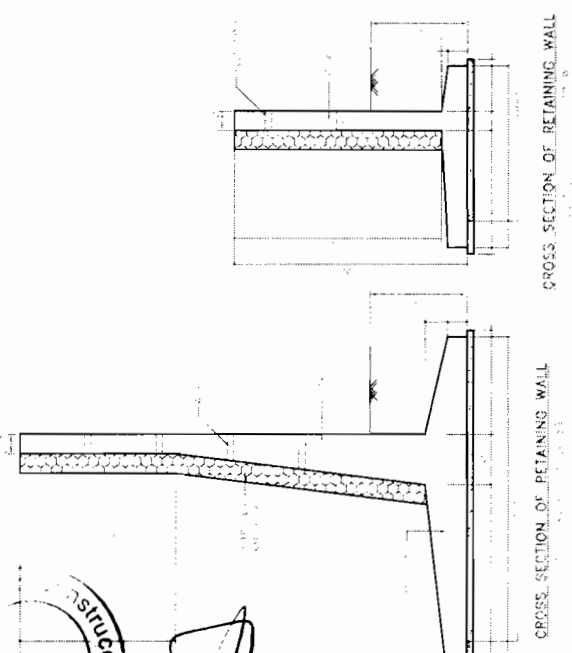
Chief Engineer,  
 World Bank Project, Odisha  
 World Bank Engineer  
 On the E.I.C.(Civil), Odisha  
 Bhubaneswar.

**CONSULTING ENGINEERS GROUP LTD.**  
 B-1/2, Market, New Market, Bhubaneswar  
 Ph. 0674-2528822, 2528823, 2528824  
 Fax. 0674-2528825, 2528826, 2528827

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

**GENERAL ARRANGEMENT DRAWING**  
**TRIPPLE OELL R.O.C. BOX CULVERT**  
**3m X3m (WITH OUT CUSHION)**

DESIGNED BY: ...  
 DATE: ...  
 CHECKED BY: ...  
 DATE: ...  
 APPROVED BY: ...  
 DATE: ...



**NOTES**

1. ALL REINFORCEMENT SHALL BE PROVIDED WITH 45° BENDS.
2. ALL REINFORCEMENT SHALL BE PROVIDED WITH 10% LAP.
3. ALL REINFORCEMENT SHALL BE PROVIDED WITH 10% LAP.
4. ALL REINFORCEMENT SHALL BE PROVIDED WITH 10% LAP.
5. ALL REINFORCEMENT SHALL BE PROVIDED WITH 10% LAP.
6. ALL REINFORCEMENT SHALL BE PROVIDED WITH 10% LAP.
7. ALL REINFORCEMENT SHALL BE PROVIDED WITH 10% LAP.
8. ALL REINFORCEMENT SHALL BE PROVIDED WITH 10% LAP.
9. ALL REINFORCEMENT SHALL BE PROVIDED WITH 10% LAP.
10. ALL REINFORCEMENT SHALL BE PROVIDED WITH 10% LAP.

**REFERENCE DRAWING:-**

1. RETAINING WALLS

2. RETAINING WALLS

3. RETAINING WALLS

4. RETAINING WALLS

5. RETAINING WALLS

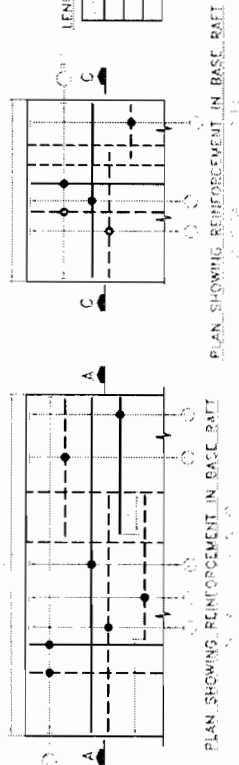
6. RETAINING WALLS

7. RETAINING WALLS

8. RETAINING WALLS

9. RETAINING WALLS

10. RETAINING WALLS



**LENGTH OF CURTAINMENT**

NO.	DESCRIPTION	UNIT	QTY
1	...	...	...
2	...	...	...
3	...	...	...
4	...	...	...
5	...	...	...
6	...	...	...
7	...	...	...
8	...	...	...
9	...	...	...
10	...	...	...

**DIMENSIONAL DETAILS**

NO.	DESCRIPTION	UNIT	QTY
1	...	...	...
2	...	...	...
3	...	...	...
4	...	...	...
5	...	...	...
6	...	...	...
7	...	...	...
8	...	...	...
9	...	...	...
10	...	...	...

**LEGENDS:**

--- 10mm

--- 12mm

--- 16mm

--- 20mm

--- 25mm

--- 32mm

--- 40mm

--- 50mm

--- 63mm

--- 80mm

--- 100mm

--- 125mm

--- 160mm

--- 200mm

--- 250mm

--- 315mm

--- 400mm

--- 500mm

--- 630mm

--- 800mm

--- 1000mm

**REINFORCEMENT DETAILS**

NO.	DESCRIPTION	UNIT	QTY
1	...	...	...
2	...	...	...
3	...	...	...
4	...	...	...
5	...	...	...
6	...	...	...
7	...	...	...
8	...	...	...
9	...	...	...
10	...	...	...

**REINFORCEMENT DETAILS**

NO.	DESCRIPTION	UNIT	QTY
1	...	...	...
2	...	...	...
3	...	...	...
4	...	...	...
5	...	...	...
6	...	...	...
7	...	...	...
8	...	...	...
9	...	...	...
10	...	...	...

**BHADRAK ANANDPUR**

NO.	DESCRIPTION	UNIT	QTY
1	...	...	...
2	...	...	...
3	...	...	...
4	...	...	...
5	...	...	...
6	...	...	...
7	...	...	...
8	...	...	...
9	...	...	...
10	...	...	...

**CONSULTING ENGINEERS GROUP LTD.**  
E-12, 1st Floor, Colony, Kalyan Nagar, Jabalpur-481001  
Tel: 031-251141, 2520889, 2521884, 2520556  
Fax: 2521546, E-mail: cepg@cepgl.com

**DIMENSION & REINFORCEMENT DETAILS OF RETURN WALL**

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

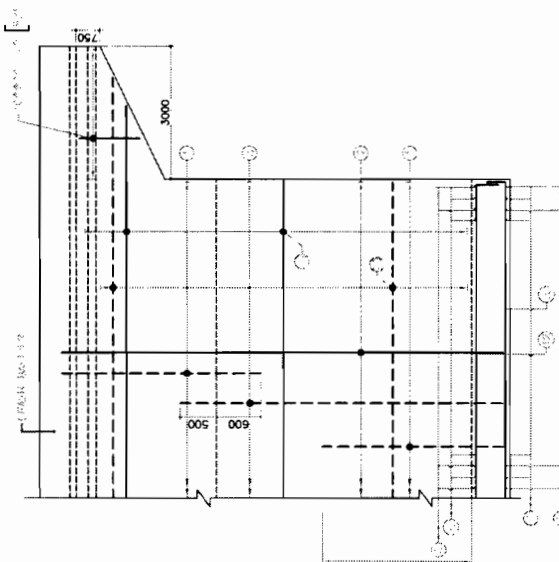
DATE	BY	CHKD	APPD
...	...	...	...
...	...	...	...
...	...	...	...
...	...	...	...

Chief Engineer  
World Bank Project  
D/o In-charge (Civil), District  
Rhubaneswar.

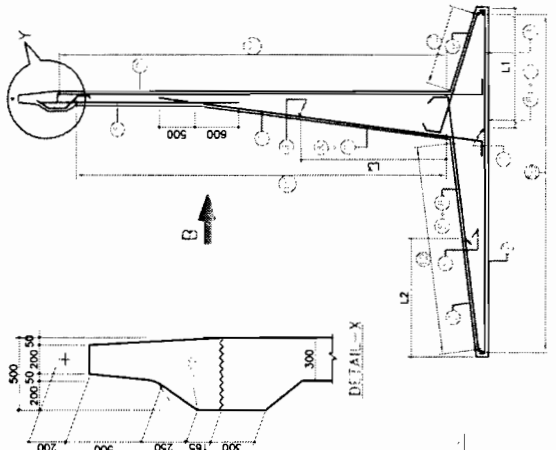
**NOTES**

1. The structure shall be constructed in accordance with the specifications of the relevant authority.
2. The structure shall be constructed in accordance with the specifications of the relevant authority.
3. The structure shall be constructed in accordance with the specifications of the relevant authority.
4. The structure shall be constructed in accordance with the specifications of the relevant authority.
5. The structure shall be constructed in accordance with the specifications of the relevant authority.
6. The structure shall be constructed in accordance with the specifications of the relevant authority.
7. The structure shall be constructed in accordance with the specifications of the relevant authority.
8. The structure shall be constructed in accordance with the specifications of the relevant authority.
9. The structure shall be constructed in accordance with the specifications of the relevant authority.
10. The structure shall be constructed in accordance with the specifications of the relevant authority.

REFERENCE DRAWING:-

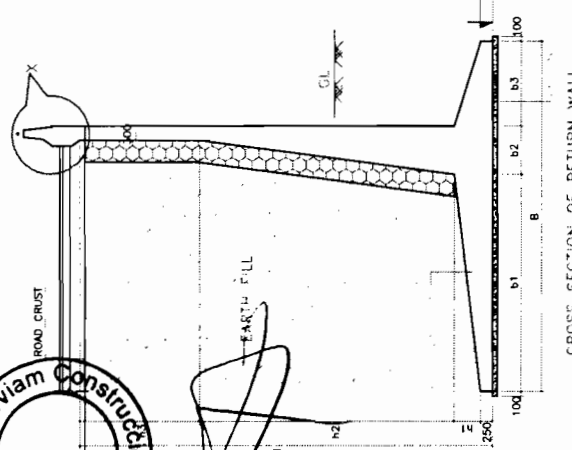


VIEW - B

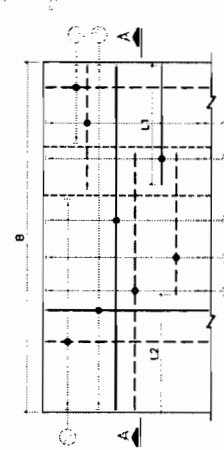


DETAIL - X

SECTION A-A



CROSS SECTION OF RETURN WALL



PLAN SHOWING REINFORCEMENT IN BASE RAFT

**DIMENSIONAL DETAILS**

Sl. No.	Part	Dimension	Value
1	Overall Length	L1	11407.0
2	Overall Width	L2	17275.0

**LENGTH OF CURTAILMENT**

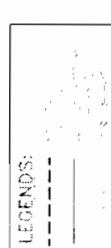
Sl. No.	Bar No.	Length	Value
1	1	L1	11407.0
2	2	L2	17275.0

**BHADRAK - ANANDPUR**

Sl. No.	Proposed Span	Height of Return wall		Length of Return wall		Category for the max. height
		Left	Right	Left	Right	
1	11407.0	8.27	8.95	6.95	8.28	C
2	17275.0	8.03	8.28	2.5	2.5	D

**REINFORCEMENT DETAILS**

Sl. No.	Bar No.	Bar Size	Bar Spacing	Bar Length	Bar Quantity
1	1	12	150	L1	11407.0
2	2	12	150	L2	17275.0



**CONSULTING ENGINEERS GROUP LTD.**  
 E-11, 1st Floor, Connaught Place, New Delhi-110028  
 Ph: 2611348, E-mail: congroup@congroup.com

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

**DIMENSION & REINFORCEMENT DETAILS OF RETURN WALL**

Checked by: [Signature] Date: [Date]  
 Approved by: [Signature] Date: [Date]

Chief Engineer,  
 World Bank Project Engineer,  
 World Bank Project, Coorsha  
 No. 01, C.C. (Civil), Office  
 Bhubaneswar.

**NOTES:**

**REFERENCE DRAWING:--**

1. CURTAIN WALL TYPE - J

2. CURTAIN WALL TYPE - K

3. CURTAIN WALL TYPE - L

4. CURTAIN WALL TYPE - M

5. CURTAIN WALL TYPE - N

6. CURTAIN WALL TYPE - O

7. CURTAIN WALL TYPE - P

8. CURTAIN WALL TYPE - Q

9. CURTAIN WALL TYPE - R

10. CURTAIN WALL TYPE - S

11. CURTAIN WALL TYPE - T

12. CURTAIN WALL TYPE - U

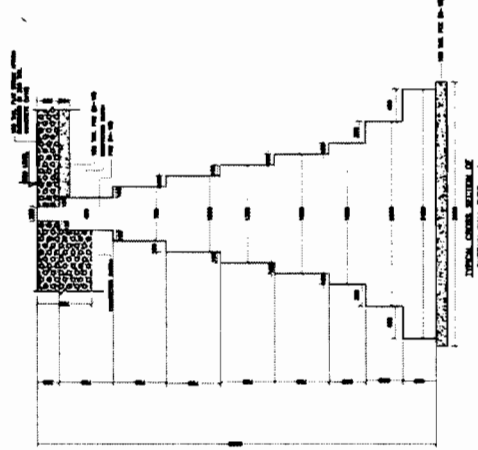
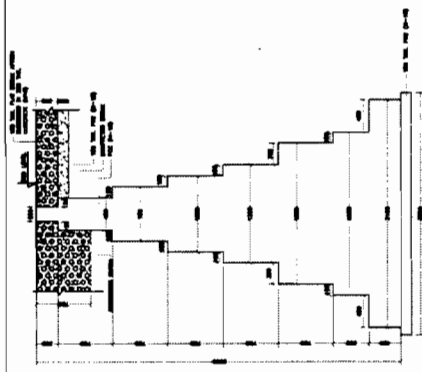
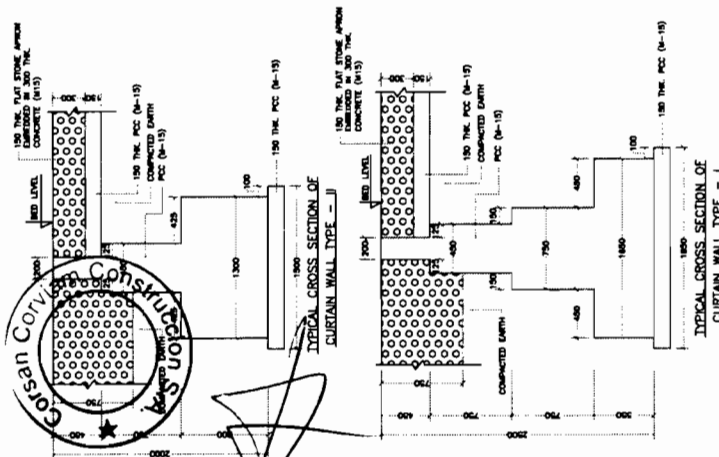
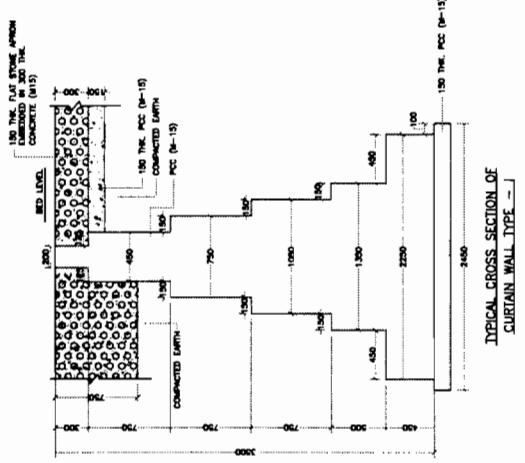
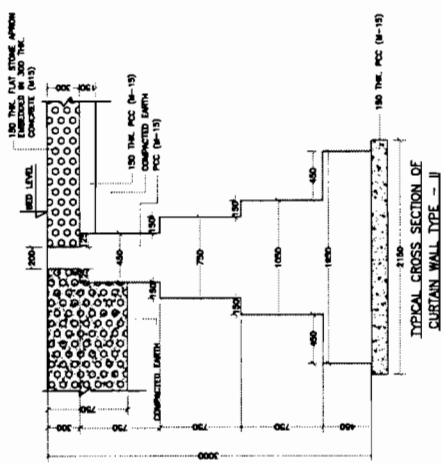
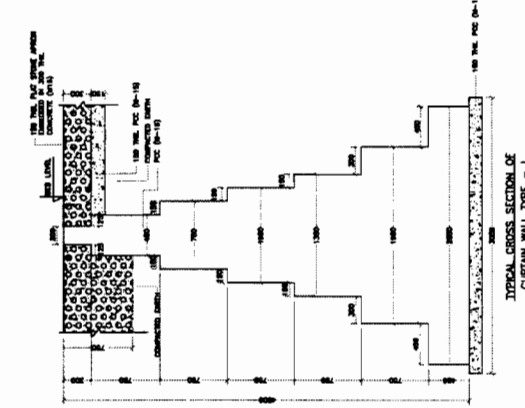
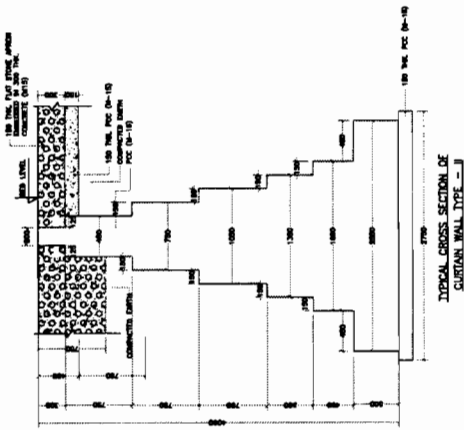
13. CURTAIN WALL TYPE - V

14. CURTAIN WALL TYPE - W

15. CURTAIN WALL TYPE - X

16. CURTAIN WALL TYPE - Y

17. CURTAIN WALL TYPE - Z



<p>GENERAL ARRANGEMENT DRAWING</p> <p>TYPICAL SECTIONS OF CURTAIN WALL</p>	<p>DATE: 10/01/2017</p> <p>SCALE: 1:50</p>
	<p>DESIGNED BY: [Signature]</p> <p>CHECKED BY: [Signature]</p> <p>APPROVED BY: [Signature]</p>
<p>ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE</p>	
<p>PROJECT: [Blank]</p>	
<p>CONSULTING ENGINEERS GROUP LTD                  C-10/107, Panchsikha, Bhubaneswar - 751007                  Ph: 2522545, 2522546, 2522547, 2522548, 2522549</p>	
<p>  </p>	

Chief Engineer  
 World Bank Project Engineer,  
 The E.T.C. (C.M.I),  
 Rhubaneswar.









GOVERNMENT OF ODISHA  
WORKS DEPARTMENT

CIVIL WORKS CONTRACT

**PACKAGE No. OSRP-Bal-P02**

*For*

Construction for Widening & Strengthening of Existing Carriageway  
to 2-Lane for Chandbali-Bhadrak-Anandpur Road  
(Km.0/000to Km.45/000 of SH-9 & Km.0/0 to Km.43/0 of SH-53)  
(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 CORSAN CORVIAM CONSTRUCCION S.A,**

India Office: 2nd Floor, Blok Two, Vatika Business Park,  
Sector-49, Sohna Road, Gurgaon-122001, Haryana (India)  
Tel. No.:(+91) 124 4823 200, Fax: (+91) 124 4823 210

**[VOLUME-V: SCHEDULES]**

**Agreement Value: Rs. 248,12,19,385**

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

September 27, 2013

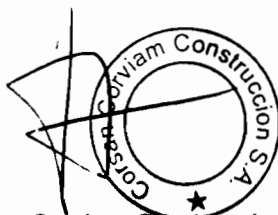


**CONTENTS of CONTRACT**

<b>Volume – I</b>	:	Letter of Acceptance, Letter of Bid and Addenda
<b>Volume – II</b>	:	Particular Conditions and the General Conditions;
<b>Volume – III</b>	:	Specifications
<b>Volume – IV</b>	:	Drawings
<b>Volume – V</b>	:	Completed Schedules,

**CONTENTS of VOLUME V**

Sl.	Description	Page No.
1	<b>Grand Summery of Price Schedule</b>	1
2	<b>Daywork Summery</b>	2
3.	<b>Price Schedule</b>	3-39



M/s Corsan Corviam Construcción S.A  
Contractor

A handwritten signature in black ink, appearing to be "S. S. S.", written over the printed name of the Chief Engineer.

Chief Engineer  
World Bank Projects, Odisha  
Employer

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



## Grand Summary of Price Schedule

Contract Name: Construction for Widening & Strengthening of existing carriageway to 2-lane for Chandbali-Bhadrak-Anadpur Road (Km. 0/000 to Km. 45/000 of SH – 9 & Km 0/000 to Km. 43/000 of SH – 53) (Balance Work)- ICB Package OSRP-Bal-P02

Contract No.: Agreement No. ~~14~~ of 2013 - 14

<i>General Summary</i>	<i>Page</i>	<i>Amount</i>
BILL NO.1 : SITE CLEARANCE	1 to 2	18,843,711.45
BILL NO.2 : EARTH WORKS	3 to 4	224,653,702.00
BILL NO.3 : SUB-BASE AND BASE COURSES	5	409,842,830.00
BILL NO.4 : BITUMINOUS COURSES	6 to 7	933,663,932.00
BILL NO.5 : CULVERTS AND UNDERPASSES	8 to 11	257,665,324.00
BILL NO.6 : BRIDGES	12 to 17	236,627,938.00
BILL NO.7 : RETAINING WALL, DRAINAGE AND PROTECTIVE WORKS	18 to 19	211,792,913.56
BILL NO.8 : ROAD SAFETY AND AMENITIES	20 to 25	135,754,701.40
BILL NO.9 : MAINTENANCE, REPAIR AND REHABILITATION	26 to 27	12,341,487.00
BILL NO.10 : ENVIRONMENTAL MITIGATION MEASURES	28 to 30	38,730,758.10
Subtotal of Bills	(A)	<b>2,479,917,297.51</b>
Total for Daywork (Provisional Sum)	(B)	1,302,087.50
Final Bid Price (A + B)	(C)	<b>2,481,219,385.01</b>
	Say,	<b>2,481,219,385.00</b>

**Rupees Two Hundred Forty Eight Crores Twelve Lakhs Nineteen Thousand Three Hundred Eighty Five Only**

M/s Corsan Corviam Construccion S.A  
Contractor

Volume-V: Page 1 of 39

Chief Engineer  
World Bank Projects, Odisha  
Employer

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

### Daywork Summary

Contract Name: Construction for Widening & Strengthening of existing carriageway to 2-lane for Chandbali-Bhadrak-Anadpur Road (Km. 0/000 to Km. 45/000 of SH – 9 & Km 0/000 to Km. 43/000 of SH – 53) (Balance Work)  
**- ICB Package OSRP-Bal-P02**

Contract No.: Agreement No. 14 of 2013 - 14

	<i>Amount (Rs.)</i>	<i>% Foreign</i>
1. Total for Daywork: Labour	267,950.00	NIL
2. Total for Daywork: Materials	722,200.00	NIL
3. Total for Daywork: Contractor's Equipment	311,937.50	NIL

**Total for Daywork (Provisional Sum) 1,302,087.50**  
(carried forward to Bid Summary, p.1 )



M/s Corsan Corviam Construccion S.A  
Contractor

  
Chief Engineer  
World Bank Projects, Odisha  
Employer

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

**Contract Name: Construction for Widening & Strengthening of existing carriageway to 2-lane for Chandball-Bhadrak-Anadpur Road (Km. 0/000 to Km. 45/000 of SH - 9 & Km 0/000 to Km. 43/000 of SH - 53) (Balance Work)- ICB Package OSRP-BaLP02**  
**PRICE SCHEDULE (Works Items & Dayworks)**

Sl. No.	Description	Unit	Quantity	Rate In Figure and Words	Amount in Figure and Words
1.01	<b>BILL NO.1 : SITE CLEARANCE</b> Cleaning and Grubbing for road land complete as per Technical Specification Clause 201 and as per the direction of Engineer.	Hectare	71.88	41775.00 Rupees Forty One Thousand Seven Hundred Seventy Five Only	3,002,787.00 Rupees Thirty Lakhs Two Thousand Seven Hundred Eighty Seven Only
1.02	Dismantling structures and pavement including disposal of resulting material and/ or salvaging useful materials complete as per Technical Specification Clause 202, 2809 and as per the direction of Engineer.				
	a) Brick/ Stone Structures of dry or in lime/ cement mortar	Cum	526.15	359.00 Rupees Three Hundred Fifty Nine Only	188,887.85 Rupees One Lakh Eighty Eight Thousand Eight Hundred Eighty Seven And Eighty Five Paise Only
	b) Concrete/Reinforced concrete/ Prestressed concrete structures including cleaning straightening & cutting of bars and separating them out from RCC/PSC. For Slab Culverts & Box Culverts and Bridges i)P.C.C.				
		Cum	718.80	251.00 Rupees Two Hundred Fifty One Only	180,418.80 Rupees One Lakh Eighty Thousand Four Hundred Eighteen And Eighty Paise Only
	ii)R.C.C.				
		Cum	1165.40	335.00 Rupees Three Hundred Thirty Five Only	390,409.00 Rupees Three Lakhs Ninety Thousand Four Hundred Nine Only
	c) Dismantling all types of Pavement course				
		Cum	40107.00	359.00 Rupees Three Hundred Fifty Nine Only	14,398,413.00 Rupees One Crore Forty Three Lakhs Ninety Eight Thousand Four Hundred Thirteen Only
	d) Hume pipe	Lm	593.00	597.00 Rupees Five Hundred Ninety Seven Only	354,021.00 Rupees Three Lakhs Fifty Four Thousand Twenty One Only

M/s Corsan Corviam Construction S.A  
Contractor

Volume-V: Page 3 of 39

Chief Engineer  
World Bank Projects, Odisha  
Employer

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



Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
e)	Kerb	Lm	288.80	597.00 Rupees Five Hundred Ninety Seven Only	172,413.60 Rupees One Lakh Seventy Two Thousand Four Hundred Thirteen And Sixty Paise Only
f)	Dry stone pitching	Cum	119.40	299.00 Rupees Two Hundred Ninety Nine Only	35,700.60 Rupees Thirty Five Thousand Seven Hundred And Sixty Paise Only
g)	RCC railing	Lm	13.80	597.00 Rupees Five Hundred Ninety Seven Only	8,238.60 Rupees Eight Thousand Two Hundred Thirty Eight And Sixty Paise Only
h)	Expansion joint	Lm	126.00	597.00 Rupees Five Hundred Ninety Seven Only	75,222.00 Rupees Seventy Five Thousand Two Hundred Twenty Two Only
i)	Wearing Coat				
	(a) Bituminous Concrete	Sqm	540.00	60.00 Rupees Sixty Only	32,400.00 Rupees Thirty Two Thousand Four Hundred Only
	b) Cement Concrete	Sqm	80.00	60.00 Rupees Sixty Only	4,800.00 Rupees Four Thousand Eight Hundred Only
	<b>Total for Bill No. 1 Carried forward to Summary</b>				<b>18,843,711.45</b> Rupees One Crore Eighty Eight Lakhs Forty Three Thousand Seven Hundred Eleven And Forty Five Paise Only

M/s Corsan Corviam Construccion S.A  
Contractor

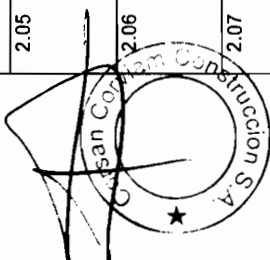
Volume-V: Page 4 of 39

Chief Engineer  
World Bank Projects, Odisha  
Employer

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

Sl. No.	Description	Unit	Quantity	Rate In Figure and Words	Amount in Figure and Words
2.01	<b>BILL NO.2 : EARTH WORKS</b> 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	512299.00	72.00 Rupees Seventy Two Only	36,885,528.00 Rupees Three Crores Sixty Eight Lakhs Eighty Five Thousand Five Hundred Twenty Eight Only
	b) Soft Rock (Blasting not required) (LS)	Cum	2000.00	172.00 Rupees One Hundred Seventy Two Only	344,000.00 Rupees Three Lakhs Forty Four Thousand Only
	c) Hard Rock (Blasting required) (LS)	Cum	2000.00	286.00 Rupees Two Hundred Eighty Six Only	572,000.00 Rupees Five Lakhs Seventy Two Thousand Only
	d) Hard rock (Blasting not required) (LS)	Cum	1000.00	359.00 Rupees Three Hundred Fifty Nine Only	359,000.00 Rupees Three Lakhs Fifty Nine Thousand Only
2.02	Construction of embankment with approved material from approved borrow areas complete as per drawing and Technical Specification Clause 305 and as per the direction of Engineer.	Cum	380997.00	198.00	75,437,406.00
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	473257.00	210.00 Rupees Two Hundred Ten Only	99,383,970.00 Rupees Nine Crores Ninety Three Lakhs Eighty Three Thousand Nine Hundred Seventy 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	77927.00	86.00 Rupees Eighty Six Only	6,701,722.00 Rupees Sixty Seven Lakhs One Thousand Seven Hundred Twenty Two Only

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 up to depth to meet the requirement of Table 300-2 complete as per Technical Specification Clause 305 and as per the direction of Engineer.	Cum	19313.00	66.00 Rupees Sixty Six Only	1,274,658.00 Rupees Twelve Lakhs Seventy Four Thousand Six Hundred Fifty Eight 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	5130.00	173.00 Rupees One Hundred Seventy Three Only	887,490.00 Rupees Eight Lakhs Eighty Seven Thousand Four Hundred Ninety Only
2.07	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.	Sqm	86997.00	24.00 Rupees Twenty Four Only	2,087,928.00 Rupees Twenty Lakhs Eighty Seven Thousand Nine Hundred Twenty Eight 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	15000.00	48.00 Rupees Forty Eight Only	720,000.00 Rupees Seven Lakhs Twenty Thousand Only
<b>Total for Bill No. 2 Carried forward to Summary</b>					<b>224,653,702.00</b> Rupees Twenty Two Crores Forty Six Lakhs Fifty Three Thousand Seven Hundred Two Only



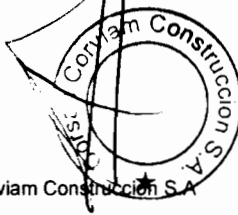
  
 Chief Engineer  
 World Bank Projects, Odisha  
 Employer  
 Chief Engineer  
 World Bank Project  
 O/o the E.I.C.(Civil), Odisha  
 Bhubaneswar.



Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
3.01	<b>BILL NO.3 : SUB-BASE AND BASE COURSES</b> 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	177634.00	1031.00  Rupees One Thousand Thirty One Only	183,140,654.00  Rupees Eighteen Crores Thirty One Lakhs Forty Thousand Six Hundred Fifty Four Only
3.02	Construction of Wet Mix Macadam Grading-I complete as per Technical Specification clause 406 and as per the direction of Engineer.	Cum	137562.00	1648.00  Rupees One Thousand Six Hundred Forty Eight Only	226,702,176.00  Rupees Twenty Two Crores Sixty Seven Lakhs Two Thousand One Hundred Seventy Six Only
	<b>Total for Bill No. 3 Carried forward to Summary</b>				<b>409,842,830.00</b>  Rupees Forty Crores Ninety Eight Lakhs Forty Two Thousand Eight Hundred Thirty Only

Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
4.01	<b>BILL NO.4 : BITUMINOUS COURSES</b> Providing bituminous primer coat over granular surface complete all as per Technical specification clause 502 and as per the direction of Engineer.	Sqm	531142.00	27.00 Rupees Twenty Seven Only	14,340,834.00 Rupees One Crore Forty Three Lakhs Forty Thousand Eight Hundred Thirty Four 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	531142.00	12.00 Rupees Twelve Only	6,373,704.00 Rupees Sixty Three Lakhs Seventy Three Thousand Seven Hundred Four Only
	b) Over normal bituminous surface	Sqm	531142.00	12.00 Rupees Twelve Only	6,373,704.00 Rupees Sixty Three Lakhs Seventy Three Thousand Seven Hundred Four 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	35948.00	9164.00 Rupees Nine Thousand One Hundred Sixty Four Only	329,427,472.00 Rupees Thirty Two Crores Ninety Four Lakhs Twenty Seven Thousand Four Hundred Seventy Two Only
4.04	Providing Bituminous Concrete wearing course with modified bitumen confirming of CRMB-55 complete as per Technical Specification Clause 509 & 521 and as per the direction of Engineer.	Cum	24966.00	10699.00 Rupees Ten Thousand Six Hundred Ninety Nine Only	267,111,234.00 Rupees Twenty Six Crores Seventy One Lakhs Eleven Thousand Two Hundred Thirty Four Only
4.05	Providing, laying and rolling of close-graded premix surfacing material of 20 mm thickness composed of 11.2 mm to 0.09 mm (Type-a) or 13.2 mm to 0.09 mm (Type-b) aggregates using penetration grade bitumen to the required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a suitable plant, laying and rolling with a Smooth wheeled roller 8-10 tonne capacity, and finishing to required level and grade in spur roads complete as per technical specification clause 512 and as per the direction of Engineer.	Sqm	10108.00	237.00 Rupees Two Hundred Thirty Seven Only	2,395,596.00 Rupees Twenty Three Lakhs Ninety Five Thousand Five Hundred Ninety Six Only

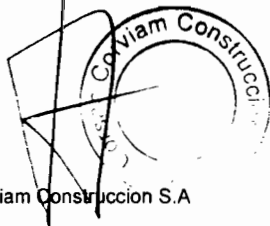
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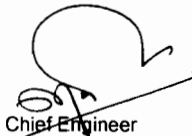
Sl. No.	Description	Unit	Quantity	Rate In Figure and Words	Amount in Figure and Words
4.06	Providing dry lean concrete subbase complete as per Technical Specification Clause 601 and as per the direction of Engineer.	Cum	16454.00	3867.00 Rupees Three Thousand Eight Hundred Sixty Seven Only	63,627,618.00 Rupees Six Crores Thirty Six Lakhs Twenty Seven Thousand Six Hundred Eighteen Only
4.07	Providing cement concrete pavement complete as per Technical Specification Clause 602 and as per the direction of Engineer.	Cum	33358.00	7315.00 Rupees Seven Thousand Three Hundred Fifteen Only	244,013,770.00 Rupees Twenty Four Crores Forty Lakhs Thirteen Thousand Seven Hundred Seventy Only
	<b>Total for Bill No.4 Carried forward to Summary</b>				<b>933,663,932.00</b> Rupees Ninety Three Crores Thirty Six Lakhs Sixty Three Thousand Nine Hundred Thirty Two Only

Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
5.01	<b>BILL NO.5 : CULVERTS AND UNDERPASSES</b> Earthwork in excavation of foundation for structures in all types of soil complete as per drawing and technical specifications clause 304 and 2903 including all leads and lifts and as per the direction of Engineer.	Cum	13692.00	127.00 Rupees One Hundred Twenty Seven Only	1,738,884.00 Rupees Seventeen Lakhs Thirty Eight Thousand Eight Hundred Eighty Four 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	11054.00	215.00 Rupees Two Hundred Fifteen Only	2,376,610.00 Rupees Twenty Three Lakhs Seventy Six Thousand Six Hundred Ten Only
5.03	Providing and filling behind abutment, wing wall and return wall with granular material 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	4152.00	215.00 Rupees Two Hundred Fifteen Only	892,680.00 Rupees Eight Lakhs Ninety Two Thousand Six Hundred Eighty 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	3198.00	1031.00 Rupees One Thousand Thirty One Only	3,297,138.00 Rupees Thirty Two Lakhs Ninety Seven Thousand One Hundred Thirty Eight 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, 1700 and 2100 and as per the direction of Engineer.	Cum	3535.00	3873.00 Rupees Three Thousand Eight Hundred Seventy Three Only	13,691,055.00 Rupees One Crore Thirty Six Lakhs Ninety One Thousand Five Hundred Fifty Five Only
5.06	Cement Concrete M-15 grade in substructure & headwall including centering and shuttering all complete as per Drawings and Technical Specification Sections 1500, 1700, 2100 & 2200 and as per the direction of Engineer.	Cum	2024.00	4481.00 Rupees Four Thousand Four Hundred Eighty One Only	9,069,544.00 Rupees Ninety Lakhs Sixty Nine Thousand Five Hundred Forty Four Only



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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
5.07	Reinforced cement concrete of following grades 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	3089.00	5216.00 Rupees Five Thousand Two Hundred Sixteen Only	16,112,224.00 Rupees One Crore Sixty One Lakhs Twelve Thousand Two Hundred Twenty Four Only
	b) M-25 grade	Cum	4811.00	5935.00 Rupees Five Thousand Nine Hundred Thirty Five Only	28,553,285.00 Rupees Two Crores Eighty Five Lakhs Fifty Three Thousand Two Hundred Eighty Five Only
5.08	Reinforced cement concrete M-30 grade in approach slabs including cost of reinforcement all complete as per Drawing and Technical Specification Clause 1500, 1700 & 2704 and as per the direction of Engineer.	Cum	1547.00	10082.00	15,596,854.00
5.09	HYSD (TMT) bar reinforcement complete as per drawing and technical specifications clause 1600 and as per the direction of Engineer.	MT	1517.00	62206.00 Rupees Sixty Two Thousand Two Hundred Six Only	94,366,502.00 Rupees Nine Crores Forty Three Lakhs Sixty Six Thousand Five Hundred Two Only
5.10	Providing laying and joining NP-4(I.S. 458) hume pipes with culvert complete as per drawing, technical specification section 2900 and IRC special publication no.13 and as per the direction of Engineer.				
	a) 1m dia Hume Pipe in Single Row	Lm	2346.00	6696.00 Rupees Six Thousand Six Hundred Ninety Six Only	15,708,816.00 Rupees One Crore Fifty Seven Lakhs Eight Thousand Eight Hundred Sixteen Only
	b) 1m dia Hume Pipe in Double Row	Lm	919.25	13392.00 Rupees Thirteen Thousand Three Hundred Ninety Two Only	12,310,596.00 Rupees One Crore Twenty Three Lakhs Ten Thousand Five Hundred Ninety Six Only

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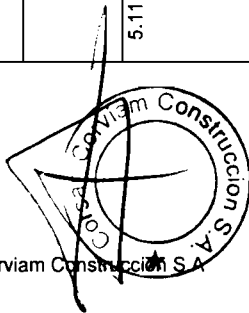
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Sl. No.	Description	Unit	Quantity	Rate In Figure and Words	Amount In Figure and Words
	c) 0.3m dia in Single Row for Utility Duct/ Reptile Pass	Lm	1285.00	2149.00 Rupees Two Thousand One Hundred Forty Nine Only	2,761,465.00 Rupees Twenty Seven Lakhs Sixty One Thousand Four Hundred Sixty Five Only
5.11	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	3572.00	1031.00 Rupees One Thousand Thirty One Only	3,682,732.00 Rupees Thirty Six Lakhs Eighty Two Thousand Seven Hundred Thirty Two Only
5.12	Providing and laying stone Pitching on embankment slopes complete as per drawing and technical specification Clause 2504 and as per direction of the Engineer.	Cum	9308.00	849.00 Rupees Eight Hundred Forty Nine Only	7,902,492.00 Rupees Seventy Nine Lakhs Two Thousand Four Hundred Ninety Two Only
5.13	Providing rubble stone flooring in Cement mortar(1 Cement 3 sand) and joints complete as per Drawing and Technical Specification Section 1400, 2504 and as per the direction of Engineer.	Cum	2838.00	906.00 Rupees Nine Hundred Six Only	2,571,228.00 Rupees Twenty Five Lakhs Seventy One Thousand Two Hundred Twenty Eight Only
5.14	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.	No	7787.00	299.00 Rupees Two Hundred Ninety Nine Only	2,328,313.00 Rupees Twenty Three Lakhs Twenty Eight Thousand Three Hundred Thirteen Only
5.15	Supplying, fitting and fixing in position true to line and level tar paper bearings conforming to IRC-83 (para-II) section IX complete with all accessories as per drawings and technical specification clause 2011, IS 1398 and as per the direction of Engineer.	Sqm	18.00	239.00 Rupees Two Hundred Thirty Nine Only	4,302.00 Rupees Four Thousand Three Hundred Two Only
5.16	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	2376.00	5968.00 Rupees Five Thousand Nine Hundred Sixty Eight Only	14,179,968.00 Rupees One Crore Forty One Lakhs Seventy Nine Thousand Nine Hundred Sixty Eight Only

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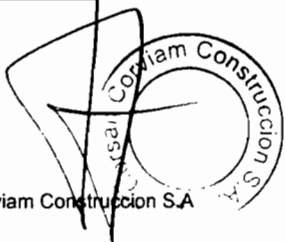
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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
5.17	Reinforced cement concrete railing complete as per Drawing and Technical Specification Section 2700 (including cost of Reinforcement) and as per the direction of Engineer.	Lm	2101.00	1452.00	3,050,652.00 Rupees Thirty Lakhs Fifty Thousand Six Hundred Fifty Two Only
5.18	Bituminous wearing course 50mm thick comprising 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 503, 509, 515 & 2700 and as per the direction of Engineer.	Sqm	11965.00	600.00	7,179,000.00
5.19	Synthetic enamel painting of culvert no. and span arrangement as per IRC - 7 - 1971 and as per the direction of Engineer.	No.	388.00	518.00	200,984.00 Rupees Two Lakhs Thousand Nine Hundred Eighty Four Only
5.20	Providing and applying 2 coats of water based cement paint to unplastered concrete surface after cleaning the surface from dirt, dust, oil, grease, efflorescence and applying paint @ 1 litre for 2 Sqm etc. complete as per the direction of Engineer.	Sqm	1000.00	90.00	90,000.00 Rupees Ninety Thousand Only
	<b>Total for Bill No.5 Carried forward to Summary</b>				<b>257,665,324.00</b> Rupees Twenty Five Crores Seventy Six Lakhs Sixty Five Thousand Three Hundred Twenty Four Only

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Sl. No.	Description	Unit	Quantity	Rate In Figure and Words	Amount in Figure and Words
6.01	<b>BILL NO.6 : BRIDGES</b> 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	35516.00	127.00 Rupees One Hundred Twenty Seven Only	4,510,532.00 Rupees Forty Five Lakhs Ten Thousand Five Hundred Thirty Two 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 with granular material including all leads & lifts as per Technical specification Clause 304 and as per the direction of Engineer.	Cum	61066.00	215.00 Rupees Two Hundred Fifteen Only	13,129,190.00 Rupees One Crore Thirty One Lakhs Twenty Nine Thousand One Hundred Ninety 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	1280.00	1031.00 Rupees One Thousand Thirty One Only	1,319,680.00 Rupees Thirteen Lakhs Nineteen Thousand Six Hundred Eighty 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, 1700 & 2100 and as per the direction of Engineer.	Cum	2311.00	3938.00 Rupees Three Thousand Nine Hundred Thirty Eight Only	9,100,718.00 Rupees Ninety One Lakhs Thousand Seven Hundred Eighteen 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	3181.00	4108.00 Rupees Four Thousand One Hundred Eight Only	13,067,548.00 Rupees One Crore Thirty Lakhs Sixty Seven Thousand Five Hundred Forty Eight 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	146.00	5007.00 Rupees Five Thousand Seven Only	731,022.00 Rupees Seven Lakhs Thirty One Thousand Twenty Two Only

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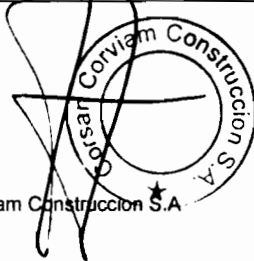
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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
6.07	Reinforced cement concrete in substructure complete as per drawing & Technical specification sections 1500, 1700, 2200 and as per the direction of Engineer.				
	a) M-20 grade	Cum	859.00	5795.00 Rupees Five Thousand Seven Hundred Ninety Five Only	4,977,905.00 Rupees Forty Nine Lakhs Seventy Seven Thousand Nine Hundred Five Only
	b) M-25 grade	Cum	8749.00	5905.00 Rupees Five Thousand Nine Hundred Five Only	51,662,845.00 Rupees Five Crores Sixteen Lakhs Sixty Two Thousand Eight Hundred Forty Five Only
	c) M-30 grade	Cum	709.00	6042.00 Rupees Six Thousand Forty Two Only	4,283,778.00 Rupees Forty Two Lakhs Eighty Three Thousand Seven Hundred Seventy Eight Only
	d) M-35 grade	Cum	6302.00	6243.00 Rupees Six Thousand Two Hundred Forty Three Only	39,343,386.00 Rupees Three Crores Ninety Three Lakhs Forty Three Thousand Three Hundred Eighty Six Only
6.08	Reinforced Cement Concrete of following grades in super structure complete as per Drawing and Technical Specification section 1500, 1700, 2300 and as per the direction of the Engineer.				
	a) M-20 grade	Cum	27.00	5762.00 Rupees Five Thousand Seven Hundred Sixty Two Only	155,574.00 Rupees One Lakh Fifty Five Thousand Five Hundred Seventy Four Only
	b) M-25 grade	Cum	10.00	5873.00 Rupees Five Thousand Eight Hundred Seventy Three Only	58,730.00 Rupees Fifty Eight Thousand Seven Hundred Thirty Only
	c) M-30 grade	Cum	462.00	6421.00 Rupees Six Thousand Four Hundred Twenty One Only	2,966,502.00 Rupees Twenty Nine Lakhs Sixty Six Thousand Five Hundred Two Only
6.09	Reinforced cement concrete railing complete as per drawing and Technical Specification section 2703 and as per the direction of Engineer.	Lm	333.00	1452.00 Rupees One Thousand Four Hundred Fifty Two Only	483,516.00 Rupees Four Lakhs Eighty Three Thousand Five Hundred Sixteen Only

Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
6.10	Providing HYSD (TMT) bar reinforcement complete as per drawing and technical specifications clause 1600 and as per the direction of Engineer. a) in Foundation	MT	9.00	62206.00 Rupees Sixty Two Thousand Two Hundred Six Only	559,854.00 Rupees Five Lakhs Fifty Nine Thousand Eight Hundred Fifty Four Only
	b) in Substructure	MT	914.00	62206.00 Rupees Sixty Two Thousand Two Hundred Six Only	56,856,284.00 Rupees Five Crores Sixty Eight Lakhs Fifty Six Thousand Two Hundred Eighty Four Only
	c) in Superstructure	MT	8.00	62206.00 Rupees Sixty Two Thousand Two Hundred Six Only	497,648.00 Rupees Four Lakhs Ninety Seven Thousand Six Hundred Forty Eight Only
6.11	Providing and fixing specified bearings complete as per Drawing and Technical Specification 2000 and as per the direction of the Engineer.				
	a) Elastomeric Bearing	Cucm	144000.00	1.00 Rupees One Only	144,000.00 Rupees One Lakh Forty Four Thousand Only
	b) Tar paper bearing	Sqm	18.00	239.00 Rupees Two Hundred Thirty Nine Only	4,302.00 Rupees Four Thousand Three Hundred Two Only
6.12	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	1537.00	9968.00 Rupees Nine Thousand Nine Hundred Sixty Eight Only	15,320,816.00 Rupees One Crore Fifty Three Lakhs Twenty Thousand Eight Hundred Sixteen Only

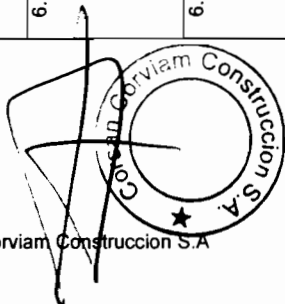
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Sl. No.	Description	Unit	Quantity	Rate In Figure and Words	Amount In Figure and Words
6.13	Bituminous wearing course 56mm thick comprising 50mm thick asphaltic Concrete with modified bitumen confirming of CRMB-55 in a single layer over Bituminous mastic course 6 mm thick with a prime Coat Complete as per drawing and Technical Specification Sections 503, 509, 515 & 2700 and as per the direction of Engineer.	Sqm	1820.00	600.00 Rupees Six Hundred Only	1,092,000.00 Rupees Ten Lakhs Ninety Two Thousand Only
6.14	Providing and fixing Drainage Spouts Complete as per drawing and Technical Specification Clause 2705 and as per the direction of Engineer.	No	50.00	2984.00 Rupees Two Thousand Nine Hundred Eighty Four Only	149,200.00 Rupees One Lakh Forty Nine Thousand Two Hundred Only
6.15	Providing and laying Stone pitching in slopes complete as per drawing and Technical Specification Section 2500 and as per the direction of Engineer.	Cum	398.00	849.00 Rupees Eight Hundred Forty Nine Only	337,902.00 Rupees Three Lakhs Thirty Seven Thousand Nine Hundred Two Only
6.16	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	264.00	1031.00 Rupees One Thousand Thirty One Only	272,184.00 Rupees Two Lakhs Seventy Two Thousand One Hundred Eighty Four Only
6.17	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.	No	5751.00	299.00 Rupees Two Hundred Ninety Nine Only	1,719,549.00 Rupees Seventeen Lakhs Nineteen Thousand Five Hundred Forty Nine Only
6.18	Providing rubble Stone flooring in Cement mortar (1Cement:3 sand) and joints Complete as per drawing and Technical Specification Section 1400 and 2505 and as per the direction of Engineer.	Cum	1090.00	906.00 Rupees Nine Hundred Six Only	987,540.00 Rupees Nine Lakhs Eighty Seven Thousand Five Hundred Forty Only

Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
6.19	Supplying and fixing of Asphaltic plug expansion joint complete as per drawing specifications and as per the direction of Engineer.	Lm	242.00	5968.00 Rupees Five Thousand Nine Hundred Sixty Eight Only	1,444,256.00 Rupees Fourteen Lakhs Forty Four Thousand Two Hundred Fifty Six Only
6.20	Synthetic enamel painting of Bridge No. and span arrangement as per IRC - 7 - 1971 and as per the direction of Engineer.	No.	20.00	518.00 Rupees Five Hundred Eighteen Only	10,360.00 Rupees Ten Thousand Three Hundred Sixty Only
6.21	Carrying and Confirmatory bores up to required depth at locations of bridges in all types of soil (except hard rock) for depth upto 10m as directed by the Engineer complete in all respects, conducting all the tests required as directed by the Engineer and as per Technical Specification Section 2400 and interpretation of the bore data and presentation of the results and as per the direction of the Engineer.	Lm	200.00	1791.00 Rupees One Thousand Seven Hundred Ninety One Only	358,200.00 Rupees Three Lakhs Fifty Eight Thousand Two Hundred Only
6.22	Providing and painting of flood gauge on substructure is fall height and 500mm width and as per the direction of Engineer.	Lm	15.00	1791.00 Rupees One Thousand Seven Hundred Ninety One Only	26,865.00 Rupees Twenty Six Thousand Eight Hundred Sixty Five Only
6.23	Providing and laying 150mm dia. HDPE Service pipe as per drawing and as per the direction of Engineer.	Lm	614.00	299.00 Rupees Two Hundred Ninety Nine Only	183,586.00 Rupees One Lakh Eighty Three Thousand Five Hundred Eighty Six Only
6.24	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 the Engineer.	Cum	712.00	215.00 Rupees Two Hundred Fifteen Only	153,080.00 Rupees One Lakh Fifty Three Thousand Eighty Only
6.25	Providing Sand Filling in Foundation Trenches as per Drawing & Technical Specification Clause 304, 305 and as per the direction of the Engineer.	Cum	9606.00	705.00 Rupees Seven Hundred Five Only	6,772,230.00 Rupees Sixty Seven Lakhs Seventy Two Thousand Two Hundred Thirty Only

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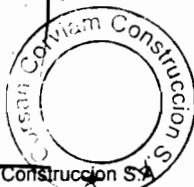
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Sl. No.	Description	Unit	Quantity	Rate In Figure and Words	Amount In Figure and Words
6.26	Providing and laying PCC of following grades in flooring as per Drawing & Technical Specification section 1700, 2500 and as per the direction of Engineer.				
	a) M-15 Grade	Cum	316.00	4108.00 Rupees Four Thousand One Hundred Eight Only	1,298,128.00 Rupees Twelve Lakhs Ninety Eight Thousand One Hundred Twenty Eight Only
	b) M-20 Grade	Cum	106.00	4843.00 Rupees Four Thousand Eight Hundred Forty Three Only	513,358.00 Rupees Five Lakhs Thirteen Thousand Three Hundred Fifty Eight Only
6.27	Providing Reinforced cement concrete crash barrier constructed with M-40 grade concrete with HYSD reinforcement conforming to IRC:21, with MS vertical plate & base plate, 50mm dia pipe and dowel bars 25 mm dia, 450 mm long at expansion joints filled with pre-moulded asphalt filler board, keyed to the structure on which it is built and installed as per design and as per dimensions in the approved drawing and at locations directed by the Engineer and Technical Specification Clause 809, and section 1500, 1600, 1700. The item includes the cost of reinforcement and its fabrication.	Lm	410.00	5106.00 Rupees Five Thousand One Hundred Six Only	2,093,460.00 Rupees Twenty Lakhs Ninety Three Thousand Four Hundred Sixty Only
6.28	Providing Cement Plastering with cement mortar (1:3) on brick work in sub-structure as per Technical Specifications and as per the direction of Engineer.	Sqm	335.00	126.00 Rupees One Hundred Twenty Six Only	42,210.00 Rupees Forty Two Thousand Two Hundred Ten Only
	<b>Total for Bill No.6 Carried forward to Summary</b>				<b>236,627,938.00</b> Rupees Twenty Three Crores Sixty Six Lakhs Twenty Seven Thousand Nine Hundred Thirty Eight Only

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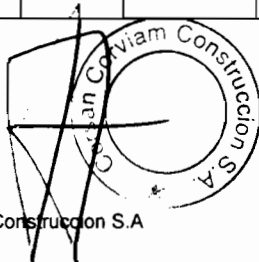
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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
<b>BILL NO.7 : RETAINING WALL, DRAINAGE AND PROTECTIVE WORKS</b>					
7.01	Retaining Wall				
(a)	Earthwork in excavation for foundation complete as per drawing and Technical Specification Clause 304 in Retaining wall for high embankment stretches as per the direction of Engineer.	Cum	5985.00	127.00 Rupees One Hundred Twenty Seven Only	760,095.00 Rupees Seven Lakhs Sixty Thousand Ninety Five Only
(b)	Providing Filter media behind wall complete as per drawing and Technical Specification Clauses 2504 and as per the direction of Engineer.	Cum	2268.00	1031.00 Rupees One Thousand Thirty One Only	2,338,308.00 Rupees Twenty Three Lakhs Thirty Eight Thousand Three Hundred Eight Only
(c)	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	399.00	3759.00 Rupees Three Thousand Seven Hundred Fifty Nine Only	1,499,841.00 Rupees Fourteen Lakhs Ninety Nine Thousand Eight Hundred Forty One Only
(d)	Cement concrete M-25 for reinforced concrete in foundation and substructure including centering and shuttering all complete as per drawing and Technical Clauses 1500, 1700, 2100 and as per the direction of Engineer.	Cum	2247.00	5565.00 Rupees Five Thousand Five Hundred Sixty Five Only	12,504,565.00 Rupees One Crore Twenty Five Lakhs Four Thousand Five Hundred Fifty Five Only
(e)	Providing steel reinforcement HYSD (TMT) bars for retaining wall complete as per drawing and Technical Specification Clause 1600 and as per the direction of Engineer.	MT	179.76	62206.00 Rupees Sixty Two Thousand Two Hundred Six Only	11,182,150.56 Rupees One Crore Eleven Lakhs Eighty Two Thousand One Hundred Fifty And Fifty Six Paise Only
(f)	Providing guard post complete as per drawings and Technical specifications section 806 and as per the direction of Engineer.	No.	1400.00	552.00 Rupees Five Hundred Fifty Two Only	772,800.00 Rupees Seven Lakhs Seventy Two Thousand Eight Hundred Only
(g)	Providing weep holes in retaining wall complete as per drawing and Technical Specification Clause 2706 and as per the direction of Engineer.	No.	400.00	299.00 Rupees Two Hundred Ninety Nine Only	119,600.00 Rupees One Lakh Nineteen Thousand Six Hundred Only

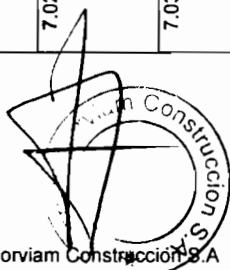
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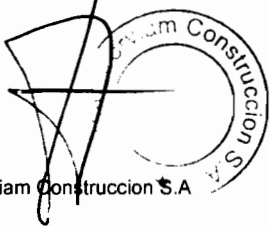
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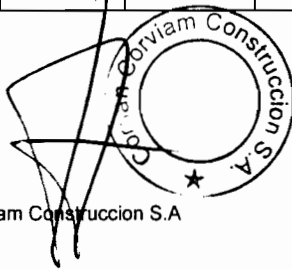


Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
7.02	Providing and laying stone pitching on embankment slopes as per drawing and Technical Specification Clause 2504 and as per the direction of Engineer.	Cum	4025.00	849.00 Rupees Eight Hundred Forty Nine Only	3,417,225.00 Rupees Thirty Four Lakhs Seventeen Thousand Two Hundred Twenty Five 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	2013.00	1031.00 Rupees One Thousand Thirty One Only	2,075,403.00 Rupees Twenty Lakhs Seventy Five Thousand Four Hundred Three 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	384976.00	36.00 Rupees Thirty Six Only	13,859,136.00 Rupees One Crore Thirty Eight Lakhs Fifty Nine Thousand One Hundred Thirty Six Only
7.05	Providing and laying in position pre-cast Cement Concrete saucer drain in blocks of length 500mm of M-35 grade to the required lines and grade over 100mm thick Cement Concrete base of M-15 grade including excavation, cost of all material, labour, transportation, taxes, royalties, rent, watering & curing, T&P etc. complete as per Drawing No-OSRP/CEG/DR and as per the direction of the Engineer.	Lm	55400.00	2947.00 Rupees Two Thousand Nine Hundred Forty Seven Only	163,263,800.00 Rupees Sixteen Crores Thirty Two Lakhs Sixty Three Thousand Eight Hundred Only
	<b>Total for Bill No.7 Carried forward to Summary</b>				<b>211,792,913.56</b> Rupees Twenty One Crores Seventeen Lakhs Ninety Two Thousand Nine Hundred Thirteen And Fifty Six Paise Only



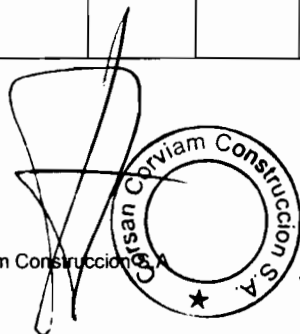
Sl. No.	Description	Unit	Quantity	Rate In Figure and Words	Amount In Figure and Words
8.01	<b>BILL NO-8 : ROAD SAFETY AND AMENITIES</b> Providing and laying plain cement concrete kerb as per drawing and Technical Specifications Clauses 408, Sections 1500 & 1700 and as per the direction of Engineer.	Lm	3337.05	388.00 Rupees Three Hundred Eighty Eight Only	1,294,775.40 Rupees Twelve Lakhs Ninety Four Thousand Seven Hundred Seventy Five And Forty Paise Only
8.02	Providing service ducts with 150mm dia GI pipes over concrete base of M-15 under existing and proposed carriageways including cutting of trenches through existing roadway and reinstatement of the same as per design and specification and as per the direction of Engineer.	Lm	5380.00	1448.00 Rupees One Thousand Four Hundred Forty Eight Only	7,790,240.00 Rupees Seventy Seven Lakhs Ninety Thousand Two Hundred Forty 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	100.00	597.00 Rupees Five Hundred Ninety Seven Only	59,700.00 Rupees Fifty Nine Thousand Seven Hundred 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	352.00	1194.00 Rupees One Thousand One Hundred Ninety Four Only	420,288.00 Rupees Four Lakhs Twenty Thousand Two Hundred Eighty Eight Only
	b) No of Kilometer stone	No	69.00	1492.00 Rupees One Thousand Four Hundred Ninety Two Only	102,948.00 Rupees One Lakh Two Thousand Nine Hundred Forty Eight Only
	c) No. of 5th Kilometer Stone	No	19.00	1791.00 Rupees One Thousand Seven Hundred Ninety One Only	34,029.00 Rupees Thirty Four Thousand Twenty Nine Only
8.05	Constructing footpath/ paved separator at toll plaza/ passenger platform / paved part of medians and islands with 50mm thick Chequered tile flooring using 25mm thick pre-cast machine pressed cement concrete chequered tiles over 25mm thick cement mortar bed in CM(1:1) over 100mm thick PCC in CC M-15 over sand filling including cost of all materials, labour, transportation, taxes, royalties, watering, curing, sundries, T&P etc.complete as per Drawing and Technical Specifications and as per the direction of the Engineer.	Sqm	3090.00	746.00 Rupees Seven Hundred Forty Six Only	2,305,140.00 Rupees Twenty Three Lakhs Five Thousand One Hundred Forty Only

Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
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	79.00	238710.00 Rupees Two Lakhs Thirty Eight Thousand Seven Hundred Ten Only	18,858,090.00 Rupees One Crore Eighty Eight Lakhs Fifty Eight Thousand Ninety Only
8.07	Construction of temporary diversion including temporary cross drainage works for plying of traffic in both directions 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	3400.00	5968.00 Rupees Five Thousand Nine Hundred Sixty Eight Only	20,291,200.00 Rupees Two Crores Two Lakhs Ninety One Thousand Two Hundred Only
8.08	Pavement marking with hot applies thermoplastic paints conforming to ASTM D86/BS3262-Part as per drawing and Technical Specifications Clause 803.4 and as per the direction of Engineer.				
	(a) Lane line / Edge marking	Sqm	34398.00	418.00 Rupees Four Hundred Eighteen Only	14,378,364.00 Rupees One Crore Forty Three Lakhs Seventy Eight Thousand Three Hundred Sixty Four Only
	(b) Directional arrows and lettering etc.	No	739.00	418.00 Rupees Four Hundred Eighteen Only	308,902.00 Rupees Three Lakhs Eight Thousand Nine Hundred Two 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 / boarders and as per the direction of Engineer.				
(a)	Informatory Signs				
	(i) Facility Information (800 x 600)mm	No	48.00	4324.00 Rupees Four Thousand Three Hundred Twenty Four Only	207,552.00 Rupees Two Lakhs Seven Thousand Five Hundred Fifty Two Only
	(ii) Direction Signs (1200 x 700 mm)	No	8.00	3432.00 Rupees Three Thousand Four Hundred Thirty Two Only	27,456.00 Rupees Twenty Seven Thousand Four Hundred Fifty Six Only

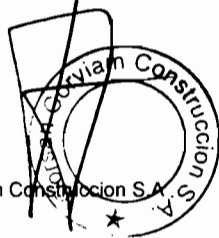


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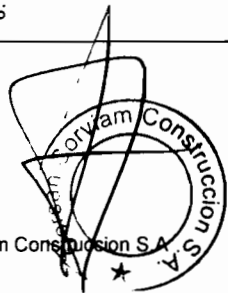
Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
	(iii) Advance Direction (size 1800 x 1200mm) ,	No	8.00	12079.00 Rupees Twelve Thousand Seventy Nine Only	96,632.00 Rupees Ninety Six Thousand Six Hundred Thirty Two Only
	(iv) Re-Assurance Sign (1800 X 1200 mm) ,	No	8.00	12079.00 Rupees Twelve Thousand Seventy Nine Only	96,632.00 Rupees Ninety Six Thousand Six Hundred Thirty Two Only
	(v) Destination Sign (1500 X 900 mm) ,	No	8.00	12079.00 Rupees Twelve Thousand Seventy Nine Only	96,632.00 Rupees Ninety Six Thousand Six Hundred Thirty Two Only
	(vi) Place Identification (1500 X 900 mm) ,	No	112.00	3432.00 Rupees Three Thousand Four Hundred Thirty Two Only	384,384.00 Rupees Three Lakhs Eighty Four Thousand Three Hundred Eighty Four Only
	(vii) Toll Booth (1500 X 900 mm)	No	2.00	12079.00 Rupees Twelve Thousand Seventy Nine Only	24,158.00 Rupees Twenty Four Thousand One Hundred Fifty Eight Only
	(viii) Bus Lane Sign (450mm x 600mm)	No	79.00	4118.00 Rupees Four Thousand One Hundred Eighteen Only	325,322.00 Rupees Three Lakhs Twenty Five Thousand Three Hundred Twenty Two Only
	(ix) Route Marker Sign(450mmx600mm)	No	20.00	4118.00 Rupees Four Thousand One Hundred Eighteen Only	82,360.00 Rupees Eighty Two Thousand Three Hundred Sixty Only
	(x) Other Informatory Signs (2100 x 1500mm)	No	75.00	12079.00 Rupees Twelve Thousand Seventy Nine Only	905,925.00 Rupees Nine Lakhs Five Thousand Nine Hundred Twenty Five Only
(b)	Cautionary Signs triangular 900mm side	No	60.00	4461.00 Rupees Four Thousand Four Hundred Sixty One Only	267,660.00 Rupees Two Lakhs Sixty Seven Thousand Six Hundred Sixty Only



Sl. No.	Description	Unit	Quantity	Rate In Figure and Words	Amount In Figure and Words
(c)	Mandatory Signs (i) Circular 600mm dia	No	120.00	3432.00 Rupees Three Thousand Four Hundred Thirty Two Only	411,840.00 Rupees Four Lakhs Eleven Thousand Eight Hundred Forty Only
	(ii) Octagon 900 mm height	No	100.00	6932.00 Rupees Six Thousand Nine Hundred Thirty Two Only	693,200.00 Rupees Six Lakhs Ninety Three Thousand Two Hundred Only
	(iii) Triangular 900 mm side	No	200.00	4461.00 Rupees Four Thousand Four Hundred Sixty One Only	892,200.00 Rupees Eight Lakhs Ninety Two Thousand Two Hundred Only
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	1600.00	412.00 Rupees Four Hundred Twelve Only	659,200.00 Rupees Six Lakhs Fifty Nine Thousand Two Hundred Only
	(ii) Hazard Marker	No	336.00	4118.00 Rupees Four Thousand One Hundred Eighteen Only	1,383,648.00 Rupees Thirteen Lakhs Eighty Three Thousand Six Hundred Forty Eight Only
	(iii) Object Marker	No	64.00	4667.00 Rupees Four Thousand Six Hundred Sixty Seven Only	298,688.00 Rupees Two Lakhs Ninety Eight Thousand Six Hundred Eighty Eight Only
8.11	Providing and fixing precast RCC Guard post with reflective paint marking on the top 25mm width band complete including end anchorage as per drawing and Technical Specifications Clause 806 and as per the direction of Engineer.	No.	8917.00	552.00 Rupees Five Hundred Fifty Two Only	4,922,184.00 Rupees Forty Nine Lakhs Twenty Two Thousand One Hundred Eighty Four Only

Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
8.12	Providing and fixing of metal beam crash barrier made out of cold rolled steel strip W profile of 3 mm thick having a minimum yield strength of 2400 kg/sqcm, width of 313 mm and depth of corrugation as 83 mm hot dip galvanized of zinc coating @ 550 gm/sq.m. The post and spacer channel is made out of cold rolled channel 150x75x5 mm having minimum yield strength of 2400 kg/sqcm and hot dip galvanized of zinc coating @ 550 gm/sq.m. The total length of post shall be 1900 mm and minimum height of post above concrete foundation shall be 800 mm. The length of spacer channel shall be 330 mm. Job includes neatly fixing new post in cement concrete of M-20 grade complete (cost included) as directed by the Engineer including fasteners and fixing etc. complete. The spacing of the Steel posts shall be about 2 m. The guard rail reflectors of 100 mm dia circular made out of 2 mm thick GI sheet duly fixed with micro-prismatic type sheeting with Type 9 ASTM D 4956-01 standards @ every 5 meters. The rate also includes the cost for supplying & fixing of terminal anchorages at both ends of barrier. The work is to be executed as per drawing, Specifications and as directed by the Engineer.	Rm	4400.00	2149.00 Rupees Two Thousand One Hundred Forty Nine Only	9,455,600.00 Rupees Ninety Four Lakhs Fifty Five Thousand Six Hundred 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.	Rm	13956.00	1791.00 Rupees One Thousand Seven Hundred Ninety One Only	24,995,196.00 Rupees Two Crores Forty Nine Lakhs Ninety Five Thousand One Hundred Ninety Six 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	32.00	2984.00 Rupees Two Thousand Nine Hundred Eighty Four Only	95,488.00 Rupees Ninety Five Thousand Four Hundred Eighty Eight Only
8.15	Providing and making rumble strips comprising of six rumbles in each set etc. complete at required places as per Drawing and as per the direction of the Engineer.	No.	622.00	5371.00 Rupees Five Thousand Three Hundred Seventy One Only	3,340,762.00 Rupees Thirty Three Lakhs Forty Thousand Seven Hundred Sixty Two Only
8.16	Providing road hump complete at required places as per drawing and as per the direction of Engineer.	No.	780.00	4280.00 Rupees Four Thousand Two Hundred Eighty Only	3,338,400.00 Rupees Thirty Three Lakhs Thirty Eight Thousand Four Hundred Only

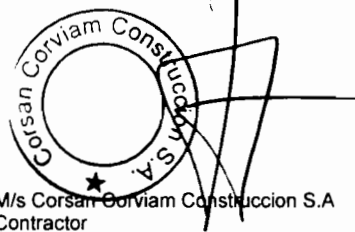
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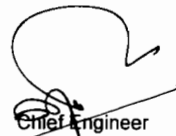
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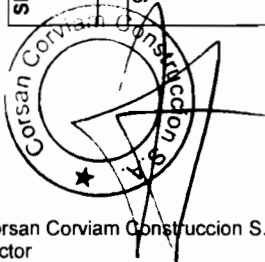
Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
8.17	Providing toll plaza as per drawing and technical specification and as per the direction of Engineer.	No.	2.00	1193546.00 Rupees Eleven Lakhs Ninety Three Thousand Five Hundred Forty Six Only	2,387,092.00 Rupees Twenty Three Lakhs Eighty Seven Thousand Ninety Two 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 and locations provided in the schedule made from injection moulded high impact polymer including cleaning, preparation of surface and fixing at position with approved quality adhesives including cost of all materials labour, transportation, taxes, duties, sundries, T&P etc. Complete as per the technical specifications and direction of Engineer.	No	23367.00	550.00 Rupees Five Hundred Fifty Only	12,851,850.00 Rupees One Crore Twenty Eight Lakhs Fifty One Thousand Eight Hundred Fifty 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	2.00	835482.00 Rupees Eight Lakhs Thirty Five Thousand Four Hundred Eighty Two Only	1,670,964.00 Rupees Sixteen Lakhs Seventy Thousand Nine Hundred Sixty Four Only
	<b>Total for Bill No.8 Carried forward to Summary</b>				<b>135,754,701.40</b> Rupees Thirteen Crores Fifty Seven Lakhs Fifty Four Thousand Seven Hundred One And Forty Paise Only


  
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Sl. No.	Description	Unit	Quantity	Rate In Figure and Words	Amount In Figure and Words
9.01	<b>BILL NO.9 MAINTENANCE, REPAIR AND REHABILITATION</b> 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) as per the direction of the Engineer.	Cum	1069.00	239.00 Rupees Two Hundred Thirty Nine Only	255,491.00 Rupees Two Lakhs Fifty Five Thousand Four Hundred Ninety One 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.) as per the direction of the Engineer.	Sqm	47520.00	30.00 Rupees Thirty Only	1,425,600.00 Rupees Fourteen Lakhs Twenty Five Thousand Six Hundred 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) as per the direction of the Engineer.	Sqm	47520.00	12.00 Rupees Twelve Only	570,240.00 Rupees Five Lakhs Seventy Thousand Two Hundred Forty 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) and as per the direction of the Engineer.	Sqm	40838.00	239.00 Rupees Two Hundred Thirty Nine Only	9,760,282.00 Rupees Ninety Seven Lakhs Sixty Thousand Two Hundred Eighty Two Only
9.05	Removal of defective concrete, cleaning the surface thoroughly, applying the shotcrete mixture mechanically with compressed air under pressure, comprising of cement, sand, coarse aggregates, water and quick setting compound in the proportion as per Clause 2807.1, sand and coarse aggregates conforming to IS: 383 and table 1 of IS: 9012 respectively, water cement ration ranging from 0.35 to 0.50, density of gunite not less than 2000kg/cum, strength not less than 25 Mpa and workmanship conforming to clause 2807.6 and as per direction of the Engineer.	Sqm	268.00	418.00 Rupees Four Hundred Eighteen Only	112,024.00 Rupees One Lakh Twelve Thousand Twenty Four Only



  
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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
9.06	Sealing of cracks/porous concrete by injection process through nipples/GROUTING complete as per Technical Specification and as per direction of the Engineer.	Kg	495.00	30.00 Rupees Thirty Only	14,850.00 Rupees Fourteen Thousand Eight Hundred Fifty Only
9.07	Repairing of wearing coat by providing and laying 75mm thick Cement concrete (M-20 grade) complete as per technical specification section 2700 and as per direction of the Engineer.	Sqm	580.00	350.00 Rupees Three Hundred Fifty Only	203,000.00 Rupees Two Lakhs Three Thousand Only
	<b>Total for Bill No.9 Carried forward to Summary</b>				<b>12,341,487.00</b> Rupees One Crore Twenty Three Lakhs Forty One Thousand Four Hundred Eighty Seven Only

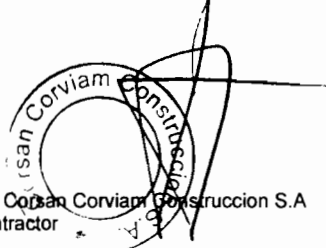
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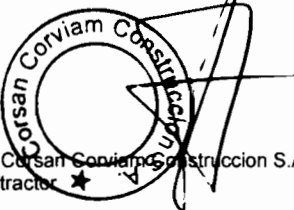
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World Bank Project  
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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
10.01	<b>BILL NO.10 ENVIRONMENTAL MITIGATION MEASURES</b> Earthwork in excavation in all kinds of soil of foundation for structures complete as per environmental drawings and the direction of the Engineer.	Cum	4939.00	127.00 Rupees One Hundred Twenty Seven Only	627,253.00 Rupees Six Lakhs Twenty Seven Thousand Two Hundred Fifty Three Only
10.02	Sand filling below foundation of wing wall, return wall and below pipe bed in layers not exceeding 150mm thick including all leads and lifts as per the environmental drawings, technical specifications and direction of the Engineer.	Cum	1221.00	705.00 Rupees Seven Hundred Five Only	860,805.00 Rupees Eight Lakhs Sixty Thousand Eight Hundred Five 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 the environmental drawings, technical specifications and direction of the Engineer.	Cum	3316.00	3759.00 Rupees Three Thousand Seven Hundred Fifty Nine Only	12,464,844.00 Rupees One Crore Twenty Four Lakhs Sixty Four Thousand Eight Hundred Forty Four Only
10.04	Providing weep holes in PCC toe wall with 100mm dia AC pipe at 1mtrs horizontal interval all complete as per the environment drawings, technical specifications and direction of the Engineer.	No	3200.00	299.00 Rupees Two Hundred Ninety Nine Only	956,800.00 Rupees Nine Lakhs Fifty Six Thousand Eight Hundred Only
10.05	Providing & laying in position Reinforced Cement Concrete of M-20 grade in foundation complete as per the environmental drawings, technical specifications and direction of the Engineer.	Cum	37.00	5455.00 Rupees Five Thousand Four Hundred Fifty Five Only	201,835.00 Rupees Two Lakhs One Thousand Eight Hundred Thirty Five Only
10.06	Providing & laying in position HYSD (TMT) reinforcement bars with anti-corrosive treatment coating complete as per the environmental drawings, technical spections and direction of Engineer.	MT	1.85	62206.00 Rupees Sixty Two Thousand Two Hundred Six Only	115,081.10 Rupees One Lakh Fifteen Thousand Eighty One And Ten Paise Only
10.07	Providing and laying filter material underneath pitching in slopes at water bodies and ponds as per the environment drawings, technical specifications and direction of the Engineer.	Cum	1920.00	1031.00 Rupees One Thousand Thirty One Only	1,979,520.00 Rupees Nineteen Lakhs Seventy Nine Thousand Five Hundred Twenty Only
10.08	Providing and laying stone pitching on slopes over filter media as per the environment drawings, technical specifications and direction of the Engineer.	Cum	3840.00	849.00 Rupees Eight Hundred Forty Nine Only	3,260,160.00 Rupees Thirty Two Lakhs Sixty Thousand One Hundred Sixty Only

  
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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
10.09	Providing cement paint two coats to the walls as per the environment drawings, technical specifications and direction of the Engineer.	Sqm	525.00	90.00 Rupees Ninety Only	47,250.00 Rupees Forty Seven Thousand Two Hundred Fifty Only
10.10	Construction of approach road with GSB and moorum topping well mixed and compacted as hard sholder as per the environment drawings, technical specifications and direction of the Engineer.	Lm	192.00	3880.00 Rupees Three Thousand Eight Hundred Eighty Only	744,960.00 Rupees Seven Lakhs Forty Four Thousand Nine Hundred Sixty Only
10.11	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.	Lm	9856.00	239.00 Rupees Two Hundred Thirty Nine Only	2,355,584.00 Rupees Twenty Three Lakhs Fifty Five Thousand Five Hundred Eighty Four Only
10.12	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 and as per the direction of Engineer.	Cum	60000.00	48.00 Rupees Forty Eight Only	2,880,000.00 Rupees Twenty Eight Lakhs Eighty Thousand Only
10.13	Providing and making masonry Oil & Grease trap chamber of required size including excavation of foundation in all kinds of soil, 100mm thick bed concrete in CC M15 over 100mm thick sand filling, 1st class KB brick masonry in (1:3) for walls up to required height, covered with 100mm thick RCC slab with man hole covers and reinforcement bars as per design, including 12mm thick cement plaster in CM(1:3) with a neat coat of cement punning to the inside wall surfaces including cost of all materials, labour, transportation, taxes, sundries, curing, T&P etc. all complete as per approved drawing No OSRP/CEG/ENV/06, technical specifications and as per the direction of the Engineer.	No	2.00	298387.00 Rupees Two Lakhs Ninety Eight Thousand Three Hundred Eighty Seven Only	596,774.00 Rupees Five Lakhs Ninety Six Thousand Seven Hundred Seventy Four Only


  
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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
10.14	Providing silt fence and sediment arrester in the construction zones and stock piles of top soil by fixing wooden posts of 100mm dia firmly to the ground at required intervals and placing closely woven fabric of coconut fibre reinforced with HDPE materials etc. complete as per drawing No OSRP/CE/Env-01, technical specifications including cost of all materials, labour, transportation, taxes, sundries, curing, T&P etc. and as per the direction of the Engineer.	Lm	3788.00	2984.00 Rupees Two Thousand Nine Hundred Eighty Four Only	11,303,392.00 Rupees One Cr re Thirteen Lakhs Three Thousand Three Hundred Ninety Two Only
10.15	Grouting stone pitching on embankments of reptile passes for making trap drain 23cm deep with Cement Concrete M15 grade using 20mm down stone aggregates as per drawing no- OSRP/CE/ENV/14, technical specifications including cost of all materials, labour, transportation, taxes, sundries, curing, T&P etc. and as per the direction of the Engineer.	Sqm	500.00	673.00 Rupees Six Hundred Seventy Three Only	336,500.00 Rupees Three Lakhs Thirty Six Thousand Five Hundred Only
				<b>Sub-Total Bill No. 10</b>	<b>38,730,758.10</b> Rupees Three Crores Eighty Seven Lakhs Thirty Thousand Seven Hundred Fifty Eight And Ten Paise Only

  
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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
<b>Schedule of Daywork Rates: 1. Labour</b>					
D101	Labour (Un-skilled)	Day	200.00	Rupees Two Hundred Only	40,000.00 Rupees Forty Thousand Only
D102	Mason (Special)	Day	25.00	Rupees Five Hundred Only	12,500.00 Rupees Twelve Thousand Five Hundred Only
D103	Carpenter (Special)	Day	10.00	Rupees Five Hundred Only	5,000.00 Rupees Five Thousand Only
D104	Mason ( Second Class)	Day	25.00	400.00 Rupees Four Hundred Only	10,000.00 Rupees Ten Thousand Only
D105	Carpenter ( Second Class)	Day	10.00	400.00 Rupees Four Hundred Only	4,000.00 Rupees Four Thousand Only
D106	Steelworker Erector	Day	35.00	400.00 Rupees Four Hundred Only	14,000.00 Rupees Fourteen Thousand Only
D107	Driver for vehicle up to 10 tons	Day	25.00	500.00 Rupees Five Hundred Only	12,500.00 Rupees Twelve Thousand Five Hundred Only
D108	Operator for excavator, dragline, shovel or crane	Day	25.00	700.00 Rupees Seven Hundred Only	17,500.00 Rupees Seventeen Thousand Five Hundred Only
D109	Operator for tractor with dozer blade or ripper	Day	25.00	400.00 Rupees Four Hundred Only	10,000.00 Rupees Ten Thousand Only
D110	Operator grader	Day	25.00	700.00 Rupees Seven Hundred Only	17,500.00 Rupees Seventeen Thousand Five Hundred Only
D111	Operator in other construction equipment	Day	25.00	600.00 Rupees Six Hundred Only	15,000.00 Rupees Fifteen Thousand Only

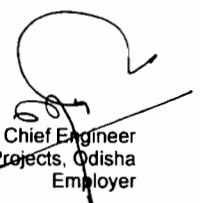
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World Bank Project  
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M/s Corsan Corviam Construction S.A  
Contractor

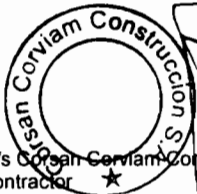
Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
D112	Chowkidars for watch & ward	Day	250.00	300.00 Rupees Three Hundred Only	75,000.00 Rupees Seventy Five Thousand Only
<b>Total</b>					<b>233,000.00</b> Rupees Two Lakhs Thirty Three Thousand Only
D113	Allow 15% (Fifteen Percent) of Subtotal for Contractor's overhead, profit, etc., in accordance with paragraph 3 (b) above			15.00%	34,950.00 Rupees Thirty Four Thousand Nine Hundred Fifty Only
					<b>267,950.00</b> Rupees Two Lakhs Sixty Seven Thousand Nine Hundred Fifty Only

  
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Sl. No.	Description	Unit	Quantity	Rate In Figure and Words	Amount In Figure and Words
<b>Schedule of Daywork Rates: 2. Materials</b>					
D201	Cement, ordinary Portland or equivalent in bags conforming to IS:269:1989 and IS 455:1989	Per Mt	10.00	7000.00 Rupees Seven Thousand Only	70,000.00 Rupees Seventy Thousand Only
D202	HYSD reinforcing bars upto 25 mm dia conforming to IS:1786:1989	Per Mt	3.00	50000.00 Rupees Fifty Thousand Only	150,000.00 Rupees One Lakh Fifty Thousand Only
D203	Bricks of class designation 75 as per IS:1077:1992	Per 1000 Nos	10000.00	6000.00 Rupees Six Thousand Only	60,000.00 Rupees Sixty Thousand Only
D204	Anti Corrosive Bituminous paint	Per Lit	5.00	200.00 Rupees Two Hundred Only	1,000.00 Rupees One Thousand Only
D205	Enamel Paint of any shade & colour (IS:2932-1964 & IS 137-1975)	Per Lit	5.00	150.00 Rupees One Hundred Fifty Only	750.00 Rupees Seven Hundred Fifty Only
D206	Coarse Sand as per IS 1542	Per Cum	25.00	500.00 Rupees Five Hundred Only	12,500.00 Rupees Twelve Thousand Five Hundred Only
D207	R.R. Stone for masonry	Per Cum	25.00	800.00 Rupees Eight Hundred Only	20,000.00 Rupees Twenty Thousand Only
D208	Crusher broken stone aggregates up to 25 mm nominal size	Per Cum	25.00	1000.00 Rupees One Thousand Only	25,000.00 Rupees Twenty Five Thousand Only
D209	Crusher broken stone aggregates Above 25 mm nominal size	Per Cum	25.00	950.00 Rupees Nine Hundred Fifty Only	23,750.00 Rupees Twenty Three Thousand Seven Hundred Fifty Only





Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
D210	Portable water at site	KL	2500.00	50.00 Rupees Fifty Only	125,000.00 Rupees One Lakh Twenty Five Thousand Only
D211	Gravel/ Moorum for Road Work	Per Cum	25.00	200.00 Rupees Two Hundred Only	5,000.00 Rupees Five Thousand Only
D212	Bitumen-VG-30	Per Mt	3.00	45000.00 Rupees Forty Five Thousand Only	135,000.00 Rupees One Lakh Thirty Five Thousand Only
					<b>628,000.00</b>
					Rupees Six Lakhs Twenty Eight Thousand Only
D213	Allow 15% (Fifteen Percent) of Subtotal for Contractor's overhead, profit, etc., in accordance with paragraph 3 (b) above			15.00%	94,200.00 Rupees Ninety Four Thousand Two Hundred Only
					<b>722,200.00</b>
					Rupees Seven Lakhs Twenty Two Thousand Two Hundred Only

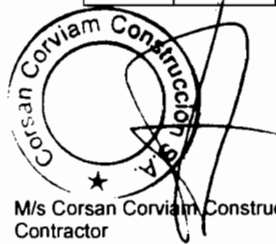


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Contractor

Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
<b>Schedule of Daywork Rates: 3. Contractor's Equipment</b>					
D301 Excavator, face shovel, or dragging:					
D301.1	Up to and including 1 m3	Hour	25.00	1550.00 Rupees One Thousand Five Hundred Fifty Only	38,750.00 Rupees Thirty Eight Thousand Seven Hundred Fifty Only
D301.2	Over 1 m 3 to 2 m 3	Hour	15.00	2500.00 Rupees Two Thousand Five Hundred Only	37,500.00 Rupees Thirty Seven Thousand Five Hundred Only
D301.3	Over 2 m 3	Hour	5.00	3500.00 Rupees Three Thousand Five Hundred Only	17,500.00 Rupees Seventeen Thousand Five Hundred Only
D302 Tractor, including bull or angle dozer:					
D302.1	Up to and including 150 kW	Hour	25.00	350.00 Rupees Three Hundred Fifty Only	8,750.00 Rupees Eight Thousand Seven Hundred Fifty Only
D302.2	Over 150 kW to 200 kW	Hour	15.00	500.00 Rupees Five Hundred Only	7,500.00 Rupees Seven Thousand Five Hundred Only
D302.3	Over 200 kW to 250 kW	Hour	5.00	750.00 Rupees Seven Hundred Fifty Only	3,750.00 Rupees Three Thousand Seven Hundred Fifty Only
D303 Tractor with ripper:					
D303.1	Up to and including 200 kW	Hour	15.00	500.00 Rupees Five Hundred Only	7,500.00 Rupees Seven Thousand Five Hundred Only
D303.2	Over 200 kW to 250 kW	Hour	5.00	700.00 Rupees Seven Hundred Only	3,500.00 Rupees Three Thousand Five Hundred Only
D304	Motor grader	Hour	20.00	2000.00 Rupees Two Thousand Only	40,000.00 Rupees Forty Thousand Only
D305	Crane- 5 tonne	Hour	20.00	300.00 Rupees Three Hundred Only	6,000.00 Rupees Six Thousand Only
D306	Diesel Road Roller, or Vibratory Compactor upto 10 t	Hour	20.00	1000.00 Rupees One Thousand Only	20,000.00 Rupees Twenty Thousand Only

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Contractor

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	50.00	850.00 Rupees Eight Hundred Fifty Only	42,500.00 Rupees Forty Two Thousand Five Hundred Only
D308	Tractor with trolley, or tractor with water tanker trailer, tractor with ripper	Tractor with hydraulic scraper			
	(a) upto 25 HP	Hour	20.00	150.00 Rupees One Hundred Fifty Only	3,000.00 Rupees Three Thousand Only
	(b) For 25-40 HP	Hour	15.00	200.00 Rupees Two Hundred Only	3,000.00 Rupees Three Thousand Only
D309	Bitumen mixture (10-14 Cft.) C.C	Hour	10.00	350.00 Rupees Three Hundred Fifty Only	3,500.00 Rupees Three Thousand Five Hundred Only
D310	Water pumping sets mounted on trolley (diesel driven)with inlet & outlet pipes.				
	a) Sets up to 10 HP	Hour	5.00	150.00 Rupees One Hundred Fifty Only	750.00 Rupees Seven Hundred Fifty Only
	b) Sets 11 to 20 HP	Hour	5.00	200.00 Rupees Two Hundred Only	1,000.00 Rupees One Thousand Only
	c) Sets above 20 HP	Hour	5.00	300.00 Rupees Three Hundred Only	1,500.00 Rupees One Thousand Five Hundred Only
D311	Generator sets mounted on trolley				
	a) Sets upto 5 Kva	Hour	5.00	100.00 Rupees One Hundred Only	500.00 Rupees Five Hundred Only
	b) Sets 5-15 Kva	Hour	5.00	200.00 Rupees Two Hundred Only	1,000.00 Rupees One Thousand Only
D312	Mobile Crane / Power winch	Hour	5.00	750.00 Rupees Seven Hundred Fifty Only	3,750.00 Rupees Three Thousand Seven Hundred Fifty Only
D313	Bull Dozer 100/110 Hp	Hour	5.00	1700.00 Rupees One Thousand Seven Hundred Only	8,500.00 Rupees Eight Thousand Five Hundred Only

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SI. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
D314	Plate compactors	Hour	5.00	250.00 Rupees Two Hundred Fifty Only	1,250.00 Rupees One Thousand Two Hundred Fifty Only
D315	Jack hammers for dismantling	Hour	5.00	150.00 Rupees One Hundred Fifty Only	750.00 Rupees Seven Hundred Fifty Only
D316	Utility Vehicles	Hour	5.00	400.00 Rupees Four Hundred Only	2,000.00 Rupees Two Thousand Only
D317	Mini Hot Mix Plant (5TPH)	Hour	5.00	1500.00 Rupees One Thousand Five Hundred Only	7,500.00 Rupees Seven Thousand Five Hundred Only
<b>271,250.00</b>					<b>Rupees Two Lakhs Seventy One Thousand Two Hundred Fifty Only</b>
D318	Allow 15% (Fifteen Percent) of Subtotal for Contractor's overhead, profit, etc., in accordance with paragraph 3 (b) above			15.00%	40,687.50 Rupees Forty Thousand Six Hundred Eighty Seven And Fifty Paise Only
<b>311,937.50</b>					<b>Rupees Three Lakhs Eleven Thousand Nine Hundred Thirty Seven And Fifty Paise Only</b>