



GOVERNMENT OF ODISHA
WORKS DEPARTMENT

CIVIL WORKS CONTRACT

[PACKAGE No. OSRP-CW-ICB-P04A]

For

Widening & Strengthening of existing carriageway to 2-lane road from
Jagatpur to Duhuria (Km. 0/0 to Km. 49/0 of MDR)

under

Odisha State Roads Project

between

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

and

M/s VALECHA ENGINEERING LIMITED

Valecha Chambers, 4th Floor, Plot No. -B-6,
New Link Road, Andheri (W), Mumbai-400053
Ph: +91 22 26733625, Email:ho@valecha.in

[VOLUME-I: Agreement]

Agreement Value: Rs. 151,30,58,562.00

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

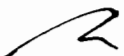
Dated: 23th September, 2013

CONTENTS of CONTRACT

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

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VALECHA ENGINEERING LIMITED
Contractor



World Bank Projects, Odisha
Bhubaneswar

भारतीय गैर न्यायिक

एक सौ रुपये

रु. 100



सत्यमेव जयते

Rs. 100

ONE
HUNDRED RUPEES

भारत INDIA
INDIA NON JUDICIAL

उड़ीसा ORISSA

D 288843

CIVIL WORKS CONTRACT

For

Widening & Strengthening of existing carriageway to 2-lane Road from Jagatpur to Duhuria
(Km. 0/00 to Km. 49/00 of MDR)

THIS AGREEMENT made the 23th day of September, 2013, between the Chief Engineer, World Bank Projects, Odisha, office of the Engineer-in-Chief(Civil), Odisha, Nirman Soudh, Unit-V, Keshari Nagar, Bhubaneswar-751001, Odisha (India). Phone : +91 239 6783 on behalf of the Government of Odisha in Works Department, Odisha Secretariat, Bhubaneswar-751001 (hereinafter "the Employer"), of the one part, and M/s Valecha Engineering Limited, Regd. Office: Valecha Chambers, 4th Floor, Plot No. B-6, New Link Road, Andheri (W), Mumbai 400053, India, Phone: +91 22 26733625, Fax : +91 22 26733945 (hereinafter "the Contractor"), of the other part for an amount of Rs. 151,30,58,562.00 (Indian Rupees One Hundred Fifty One Crore Thirty Lakh Fifty Eight Thousand Five Hundred Sixty Two) only.

VALECHA ENGINEERING LIMITED
Contractor



Volume-I: Page 2 of 100

Chief Engineer,
World Bank Projects, Odisha
On the Behalf of the Employer,
Rhubaneswa

WHEREAS the Employer desires that the Works known as “**Widening & Strengthening of existing carriageway to 2-lane Road from Jagatpur to Duhuria (Km. 0/00 to Km. 49/00 of MDR)**” 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 93 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 Works⁵ 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.




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 M/s Valecha Engineering Ltd., Mumbai

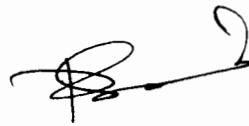

Mr. Chaitanya Keshav Chhattre,
General Manager, Valecha Engineering Limited,
Mumbai-400053

WITNESS :

1. MR. DIPAK MOHANTY,
S/o Madhu Sudan Mohanty,
At:- Madhu Sudan Nagar, Tulsipur,
Cuttack-753008, Odisha

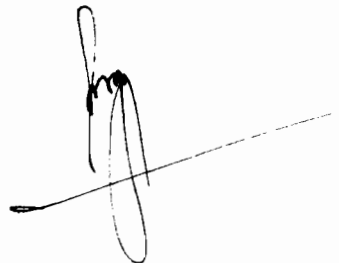


2. MR PRASANTA PADAMBUJA SAMAL,
Plot No:-BL/41, V.S.S. Nagar,
Bhubaneswar-751007, Odisha



3. ER. BINDHESWAR PATRA
Superintending Engineer-cum-Employer's Representative-P04,
O/o the EIC (Civil), Odisha

4. MR. K.B.PANDA
Financial Advisor, Project Management Unit,
Odisha State Roads Project.



NO OBJECTION OF WORLD BANK

NO OBJECTION : Odisha State Roads Project - Package No. OSRP-CW-ICB-P04A - BID Evaluation Report

rrohatgi@worldbank.org <rrohatgi@worldbank.org>

Wed, Jul 24, 2013 at 10:20 PM

To: N K Pradhan <pnuosrp@gmail.com>

Cc: Sri Kumar Tadimalla <stadimalla@worldbank.org>, Swayamsiddha Mohanty <smohanty1@worldbank.org>, Kumudni Choudhary <kchoudhary@worldbank.org>, Khabilongtshup Khumujam <kkhumujam@worldbank.org>, nvyas@worldbank.org

Dear Mr Pradhan

Thank you for your e-mail dated July 6, 2013 requesting Bank's review of the Bid Evaluation Report for "Civil Works for Widening & Strengthening of existing carriageway to 2-lane Road from Jagatpur to Duhuria (km. 0/00 to km. 49/00 of MDR) - Package - P04A" 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 Widening & Strengthening of existing carriageway to 2-lane Road from Jagatpur to Duhuria (km. 0/00 to km. 49/00 of MDR) - Package - P04A", on M/s. Valecha Engineering Limited, Mumbai at a total contract amount of INR 1,513,058,562.00, 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.(iv) Incorporating our comments(to be shared soon) on updated EA and disclosing the same.

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 Rohatgi



VALECHA ENGINEERING LIMITED
Contractor



Chief Engineer,
World Bank Projects, Odisha
Employer
Bhubaneswar

GOVERNMENT OF ODISHA
WORKS DEPARTMENT

No. 8782 W., Bhubaneswar, Dated, the
0718040086-2013

27th 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:- Widening and strengthening of existing carriageway to 2-lane Road from Jagatpur to Duhuria (Km.0/00 to 49/00 of MDR) Package No.OSRP-CW-ICB-P04A.

Sir,

I am directed to invite a reference to your letter No.32077 dt 26.7.2013 on the subject noted above and to convey approval of the Government to the lowest substantially responsive evaluated bid of M/s Valecha Engineering Ltd., Mumbai amounting to Rs.151,30,58,562.00 (Rupees one hundred fifty-one crore, thirty lakh, fifty eight thousand, five hundred sixty two) only which is 10.88% less than the corresponding estimated cost of Rs.169,77,21,365.00 with deposit of an additional performance guarantee for an amount of Rs.11.00 crore subject to the condition that the bidder be empaneled under the State.

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


07/08/2013
FA-cum-Additional Secretary to Govt.



NOTIFICATION OF AWARD

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

Letter No. PMU-WB-21/2013 - 34477

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

To

M/s Valecha Engineering Ltd.,
Valecha Chambers, 4th Floor, Plot No. -B-6,
New Link Road, Andheri (W), Mumbai
Email: ho@valecha.in; tender@valecha.in

Sub: Civil Works ICB Package No-OSRP-CW-ICB-P04A under the proposed Odisha State Roads Project with World Bank Assistance

- Widening & Strengthening of existing carriageway to 2-lane road from Jagatpur to Duhuria (Km. 0/0 to Km. 49/0 of MDR)

LETTER OF ACCEPTANCE

Ref: I. IFB No: PMU-WB-21/2013-9728 Dt. 08.03.2013
II. Your BID Dt. 31.05.2013

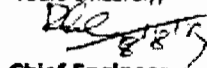
Sir,

This is to notify you that, your Bid dated 31st May, 2013 for execution of the Civil Works ICB Package No-OSRP-CW-ICB-P04A under the proposed Odisha State Roads Project with World Bank Assistance for "Widening & Strengthening of existing carriageway to 2-lane road from Jagatpur to Duhuria (Km. 0/0 to Km. 49/0 of MDR)" amounting to Indian Rs. 151,30,58,562 (Indian Rupees One hundred Fifty-one crore Thirty lakh Fifty-eight thousand Five hundred Sixty-two) 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 plus additional Performance Security pursuant to ITB Clause 34.5 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 4th December, 2016, amounting not less than Indian Rs.18,56,52,928/- (Indian Rupees Eighteen crore Fifty-six lakh Fifty-two thousand Nine hundred Twenty-eight) 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




VALECHA ENGINEERING LIMITED
Contractor


Chief Engineer,
World Bank Projects, Odisha
Bhubaneswar

LETTER of BID & ADDENDA

Bid Submission Sheet

(Agreed & Modified as per the evaluated bid)

Date: .30.05.2013

(Original submission date)

ICB No.:PMU-WB-21/2013-9728

Invitation for Bid No.: OSRP-CW-ICB-P04A

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 ;
- (b) We offer to execute in conformity with the Bidding Document the following Works: Construction for Widening & strengthening of existing carrigeway to 2-lane road from Jagatpur-Duhuria(km.0/0 to Km. 49/0 of MDR)
- (c) The total price of our Bid, excluding any discounts offered in item (d) below is:
INR 153,32,98,097 (Rupees One Hundred Fifty Three Crore Thiry Two Lakh Ninety Eight Thousand Ninety Seven Only).
- (d) The discounts offered and the methodology for their application are: **1.32%**
- (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;

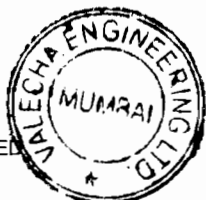
- (i) We are not participating, as a Bidder or as a subcontractor, in more than one bid in this bidding process in accordance with ITB 4.3, other than alternative offers submitted in accordance with ITB 13;
- (j) We, including any of our subcontractors or suppliers for any part of the contract, have 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./ We are a government owned entity but meet the requirements of ITB-4.5;¹
- (l) We have paid, or will pay the following commissions, gratuities, or fees with respect to the bidding process or execution of the Contract: **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 Mr. Chaitanya K Chhatre in the capacity of General Manager

Signed *Sd/- (Mr. Chaitanya K. Chhatre) &*
Round Seal of *Valecha Engineering Limited* Affixed

Duly authorized to sign the bid for and on behalf of Valecha Engineering Limited, Mumbai.

Dated on 30th May of 2013

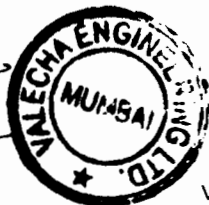


Appendix to Bid

Schedule of Adjustment Data

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	Non adjustable				a: 0.15
b	Steel Rebars	Whole sale price index for Steel(rebars) Office of Economic advisor to Govt. of India, Ministry of Commerce & Industry	171.2 May 2013		b: 0.03
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	170.4 May 2013		c: 0.16
d	Bitumen (VG 30)	Official retail price of bulk bitumen at IOC depot at Haldia	Rs.38,670 15.05.13		d: 0.25
e	Labour	Minimum wage notified by the Labour and Employee's State Insurance Department of Govt. of Odisha, India	As per Tender Document		e: 0.15
f	POL	Official retail price of HSD at IOCL/HPCL/BPCL Consumer pump depot at Kendrapara, Odisha	51.55 May 2013		f: 0.09
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	171.4 May 2013		g: 0.17
Total					1.00



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

Site Designed & Hosted by: NIC
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of the
Economic Adviser, Ministry of Commerce and Industry,
Government of India

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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
2013	168.8	170.3	172.9	171.3	170.4	170.2	169.7					
2012	160.1	160.4	163.1	164.6	164.4	167.3	169.5	171.9	171.5	170.7	168.3	164.9
2011	147.9	150.9	153.7	154.4	155.3	153.6	153	151.7	152.2	157.9	160.8	161.7
2010	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

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

Thanking you,

Yours faithfully,
 For Indian Oil Corpn Ltd.

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

VALECHA ENGINEERING LIMITED
 Contractor



Chief Engineer,
 World Bank Projects, Odisha
 State Engineering, Odisha,
 Bhubaneswar

Reference for Base Index of Labour

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

(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	Non Agriculture Sector	
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.	Agriculture Sector	
		Non-ploughing	₹ 128.00
		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.	Non Agriculture Sector	
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	Agriculture Sector	
40	Manufacture of brush and brooms	Non-ploughing	₹ 126.00
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		



VALECHA ENGINEERING LIMITED
Contractor

Chief Engineer,
World Bank Projects, Odisha
Employer
Office: 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	Non Agriculture Sector	
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	Agriculture Sector	
68	Rubber and Rubber Products Industry	Non-ploughing	₹ 126.00
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.

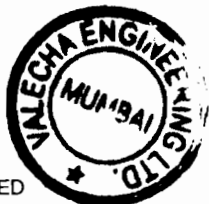
By Order of the Governor

C.T.M. SUGUNA

Commissioner-cum-Secretary to Government.



VALECHA ENGINEERING LIMITED
Contractor



Chief Engineer,
World Bank Projects, Odisha
Employer
G-10/11A, E.I. C.A. Road, Cuttack
Dist. Bhubaneswar

Reference for Base Index of POL

Indian Oil Corporation Limited

A/2, Chandasekharpur, Bhubaneswar-751024
E Mail: ppadma@indianoil.in/dmahapatra@indianoil.in



IndianOil

To,

REF: OSO/CS/BBSR/ PRICING
DATE: 05.09.2013

Sub: RETAIL HSD PRICE EX KENDRAPADA

Dear Sir,

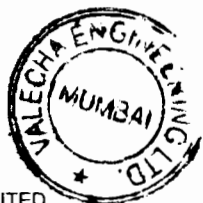
This is with regard to your mail dated 04.09.2013, we would like to inform that the Retail selling price of HSD ex Kendrapada as on 01.05.2013 was Rs.51.55 per ltr.

Thanking you.

Yours faithfully,
For Indian Oil Corpn Ltd.

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

VALECHA ENGINEERING LIMITED
Contractor



Volume-I: Page 20 of 100

Chief Engineer,
World Bank Projects, Odisha
Employer
Group Director (Civil), Odisha,
Bhubaneswar

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
2013	170.3	170.9	170.1	171.3	171.4	172.7	175.4					
2012	158.7	159.3	161	163.5	163.9	164.7	165.8	167.3	168.8	168.5	168.8	168.8
2011	148	148.1	149.5	152.1	152.4	153.1	154.2	154.9	156.2	157	157.4	157.3
2010	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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 of the
 Economic Adviser, Ministry of Commerce and Industry,
 Government of India

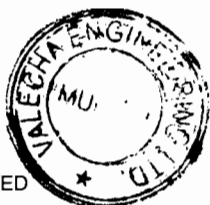
Disclaimer

Table C. Summary of Payment Currencies

Table: Alternative A

For “Widening & Strengthening of existing carriageway to 2-lane Road from Jagatpur to Duhuria (Km. 0/00 to Km. 49/00 of MDR)”

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				N.A.
Foreign currency #				N.A.
Net Bid Price In INR				153,32,98,097
Discount	1.32%			2,02,39,535
Provisional sums expressed in local currency	Nil			
BID PRICE in INR				151,30,58,562



ODISHA STATE ROADS PROJECT

(Declaration regarding customs/excise duty exemption for materials to be purchased consumption on works

(Bidder's Name and Address)

To:

The Chief Engineer,
World Bank Projects, Odisha
O/o the E.T.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: pmuosrp@gmail.com

Dear Sir:

Ref: Widening & strengthening of existing carriageway to 2-lane road from Jagatpur-Duhuria
(Km 0/0 to Km 49/0 of SH - 9A)
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:

Items	Make/ Brand Name /Class	Capacity [where applicable]	Quantity	Value	State whether it will be procured locally or imported [if so from which country]	Remarks regarding justification for the quantity and their usage in works
Goods						
[a] Bitumen (grade) Vc 10	IOCL/ BPCL	NA	5,000 MT		Procured within India	As per Mo51



Items	Make/ Brand Name (Class)	Capacity [where applicable]	Quantity	Value	State whether it will be procured locally or imported [if so from which country]	Remarks regarding justification for the quantity and their usage in works
[b] Emulsion	TAKY Tet	NA	550 MT		Procured from within India	As per MOST
[c] HSD	IOCL/ BPCL	NA	676Kiloliters		Indian Companies	As per standard
[d] LDO	IOCL	NA	705 KL		Indian Co	
[e] Cement	ISJ	43 Grade	30000MT		Indian Co	As per Max Design
[f] Steel	ISJ	FE 415	665MT		Indian Make	As per Design
[g] Others	Road Machinery Equipment & Spare Parts if required					

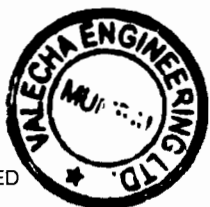
- We agree that no modification to the above list is permitted after bids are opened
- We agree that the certificate will be issued only to the extent considered reasonable by the Employer for the work, based on the Bill of Quantities and the construction programme and methodology as furnished by us along with the bid.
- 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 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 _____
Place Mumbai

(Signature) [Handwritten Signature]
(Printed Name) C. K. CHATRE
(Designation) GM
(Common Seal) [Seal]
(Common Seal) [Seal]

ELI - 1: Bidder's Information Sheet

Bidder's Information	
Bidder's legal name	M/s Valecha Engineering Limited, Mumbai.
In case of JV, legal name of each partner	N.A
Bidder's country of constitution	Indian
Bidder's year of constitution	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; border-radius: 50%; padding: 2px 5px; margin-right: 10px;">2006</div> 1993 </div> <div style="text-align: right; margin-top: 5px;"> </div>
Bidder's legal address in country of constitution	Valecha Engineering Limited, Valecha Cahmbers, 4 th Floor, Plot No B-06, Andheri New Link Road, Andheri West Mumbai-400053.
Bidder's authorized representative (name, address, telephone numbers, fax numbers, e-mail address)	<i>Mr. Chaitanya Keshav Chhatre</i> , General Manager Valecha Engineering Limited, Valecha Chambers, 4 th Floor, Plot No B-06, Andheri New Link Road, Andheri West, Mumbai -400053 Tel : 022 26733625-29/26733587 Email Id: tender@valecha.in , ho@valecha.in
Attached: <ol style="list-style-type: none"> 1. Copy of Resolution of the Board for PoA in favour of Mr. C.K. Chhatre 2. Power of Attorney for Mr. C.K. Chhatre by Mr. Jagdish K. Valecha 3. Certificate of Registration 	



EXTRACTS OF THE MINUTES OF THE BOARD MEETING OF THE BOARD OF DIRECTORS OF THE COMPANY HELD ON 12th November 2010 AT THE REGISTERED OFFICE OF THE COMPANY.

RESOLVED THAT the M/s. J.K. Infratech Private Limited, a private limited company incorporated in India and its wholly owned subsidiary, J.K. Infratech (India) Private Limited, a private limited company incorporated in India, be and they be deemed to be the joint venture partners of the Company for the purpose of the project of construction and operation of the 132 KV transmission line project in the state of Odisha, India, and the project shall be jointly owned and operated by the Company and the said joint venture partners in the ratio of 50:50. The Company shall be responsible for the overall management and operation of the project and the said joint venture partners shall be responsible for the design and construction of the project. The Company shall be responsible for the operation and maintenance of the project and the said joint venture partners shall be responsible for the design and construction of the project. The Company shall be responsible for the overall management and operation of the project and the said joint venture partners shall be responsible for the design and construction of the project. The Company shall be responsible for the operation and maintenance of the project and the said joint venture partners shall be responsible for the design and construction of the project.

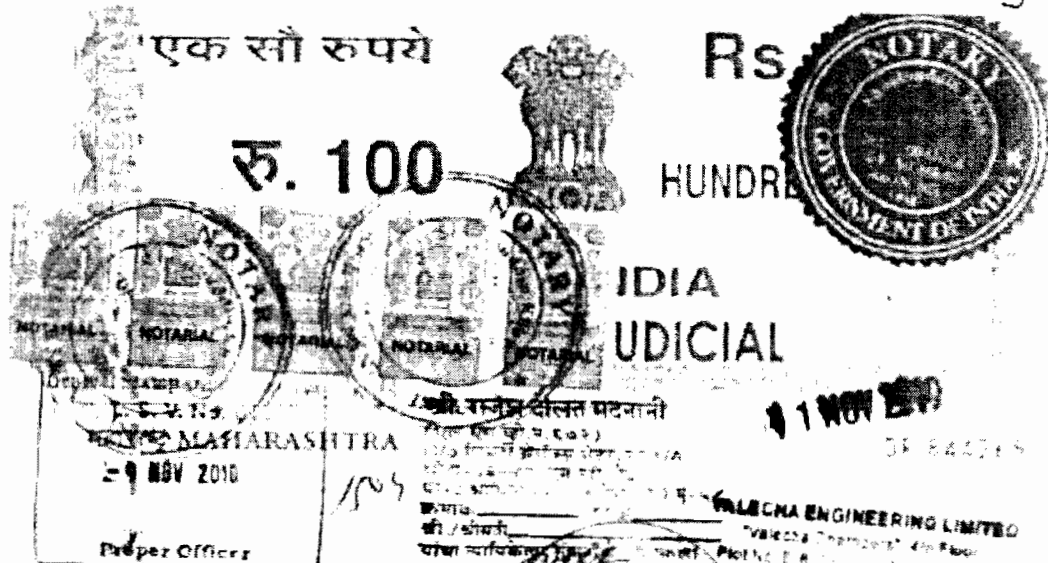
RESOLVED FURTHER THAT the said joint venture partners shall be jointly and severally responsible for the payment of the project cost and the said joint venture partners shall be jointly and severally responsible for the payment of the project cost.

For and on behalf of the Company
Director



VALECHA ENGINEERING LIMITED
Contractor

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



(MR) K. R. MADGE

SERIAL No OF ENTRY
IN MY NOTARIAL REGISTER

POWER OF ATTORNEY



I, K. R. MADGE, a resident of [Address], hereby constitute, nominate and appoint [Name of Vallecha Engineering Limited] son of [Name of Father] and residing at [Address] and holding the position of [Position] as the lawful attorney of mine to do jointly and/or severally all or any of the following acts:

- To represent the company before Govt. of India & other countries and it's all subsidiary offices, Govt. Departments, and it's subsidiary offices, Semi Govt. bodies, Govt. Bodies, Municipal Corporation, Municipalities, Government Undertaking, Enterprises, Autonomous Bodies, Statutory Boards, Authorities, Private organizations, etc. (herein after referred to as 'Authorities')
- To apply for pre-qualification, submit the pre-qualification documents, General co-operation attend meetings, plead, negotiate, satisfy and obtain pre-qualification.
- To purchase bank tender documents, submit & attend tender/Bid, offer, draft, satisfy & verify and verify the offer.
- To accept the letter of award and to sign the contract documents and enter into the same with the Authorities.
- To accept and receive the payments from the Authorities.

MANAGING DIRECTOR

MANAGING DIRECTOR



2

- 5. To form a consortium with Joint Venture for participating in bid.
- 6. To discuss, negotiate, settle and implement the terms of Agreement in Form - Joint Venture and or Consortium with partner(s) with the Joint Partner or Joint Venture of Consortium to sign and submit documents & bids on behalf of the Consortium.
- 7. To sign and submit the bid for Consortium.
- 8. To appear before the Court of law, to seek advice in relation to above, to defend the claim or company, to sign the vakalatnamas, plead, reply, answer and submit before the arbitrator, arbitrator's award and recover the amount for cost of arbiters.
- 9. To conform with the Authority for confidential compliances and execute the work.
- 10. To sub-delegate to any of employees or other person any of power vested in him specific for the purpose.

I hereby affirm and confirm that the aforesaid acts, deeds and things done by me and Power of Attorney holder as if the same are done by me.

The Power of Attorney is valid and irrevocable till such time as it is not hereby withdrawn and/or until it is revoked in writing at any time.

IN WITNESS WHEREOF, I have signed these presents at this place on this 25 NOV 2010

Name: JAGDISH VALECHA

Witness 1
 CHAITANYA KESHAV CHATRE
 GENERAL MANAGER
 VALECHA ENGINEERING LIMITED
 RAJAKHURDA, Bhubaneswar

Witness 2
 ANITA KALIA
 CHIEF ACCOUNTANT
 VALECHA ENGINEERING LIMITED
 RAJAKHURDA, Bhubaneswar

ACCEPTED BY

 CHAITANYA KESHAV CHATRE
 GENERAL MANAGER
 VALECHA ENGINEERING LIMITED
 RAJAKHURDA, Bhubaneswar

For Valecha Engineering Limited
 Company Secretary

 SHYAMKRISHNA KUMAR B.S. B.S. B.
 ADVOCATE & NOTARY
 10/10, 1st Floor, T. Nagar, Bhubaneswar
 Dist. Khurda, Odisha
 PIN - 751004
 Mob: 9828011000

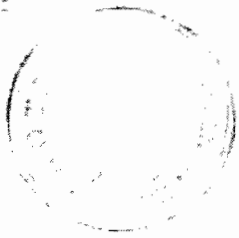


GENERAL INFORMATION

Contract No. 100/2009

VALECHA ENGINEERING LTD.

VALECHA ENGINEERING LTD.
CHANDRANIL NAGAR
ANDHERI WEST
MUMBAI 400 053

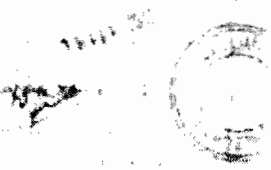


VALECHA ENGINEERING LTD. CIVIL ENGINEERS

CHANDRANIL NAGAR

TRUE COPY

441



Handwritten signature



Handwritten signature

VALECHA ENGINEERING LIMITED
Contractor

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

भारत सरकार
वित्त विभाग
आयकर विभाग
आयकर अधिनियम, 1961
अनुच्छेद 28(1) के अन्तर्गत



GOVERNMENT OF INDIA
MINISTRY OF FINANCE
DEPARTMENT OF REVENUE
INCOME TAX DEPARTMENT
INCOME TAX ACT, 1961
Section 28(1)

FORM ST-2
THE PROVISIONS OF SECTION 28(1) OF THE INCOME TAX ACT, 1961
CERTIFICATE OF REGISTRATION UNDER SECTION 28(1) OF THE INCOME TAX ACT, 1961

श्री. ए. ए. वैलेचा एंजिनियर्स लिमिटेड
श्री. ए. ए. वैलेचा एंजिनियर्स लिमिटेड, अहमदाबाद, गुजरात
श्री. ए. ए. वैलेचा एंजिनियर्स लिमिटेड, अहमदाबाद, गुजरात
श्री. ए. ए. वैलेचा एंजिनियर्स लिमिटेड, अहमदाबाद, गुजरात
श्री. ए. ए. वैलेचा एंजिनियर्स लिमिटेड, अहमदाबाद, गुजरात
श्री. ए. ए. वैलेचा एंजिनियर्स लिमिटेड, अहमदाबाद, गुजरात
श्री. ए. ए. वैलेचा एंजिनियर्स लिमिटेड, अहमदाबाद, गुजरात
श्री. ए. ए. वैलेचा एंजिनियर्स लिमिटेड, अहमदाबाद, गुजरात
श्री. ए. ए. वैलेचा एंजिनियर्स लिमिटेड, अहमदाबाद, गुजरात
श्री. ए. ए. वैलेचा एंजिनियर्स लिमिटेड, अहमदाबाद, गुजरात

Form ST-2 No. _____
Registration Number: AT/MUM/EX/1000/2000/2000
Registration Number: _____
Registration Number: _____

1. The certificate is issued to the applicant in accordance with the provisions of section 28(1) of the Income Tax Act, 1961.
2. The certificate is valid only for the purpose specified in the certificate.
3. The certificate is valid for a period of _____ months from the date of issue.
4. The certificate is valid only for the purpose specified in the certificate.
5. The certificate is valid only for the purpose specified in the certificate.
6. The certificate is valid only for the purpose specified in the certificate.
7. The certificate is valid only for the purpose specified in the certificate.
8. The certificate is valid only for the purpose specified in the certificate.
9. The certificate is valid only for the purpose specified in the certificate.
10. The certificate is valid only for the purpose specified in the certificate.



VALECHA ENGINEERING LIMITED
Contractor

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

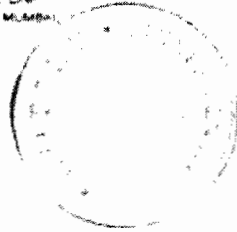
Mar. P08 Certificate

27350000483V

VALECHA ENGINEERING LTD.

VALECHA ENGINEERING LTD.

VALECHA CHAMBERS, CEHMANA VILLAGE LDP
ROAD (BY ANCHER WADI) 400017, TALKA, MUMBAI,
Dist. MUMBAI, MAHARASHTRA, India



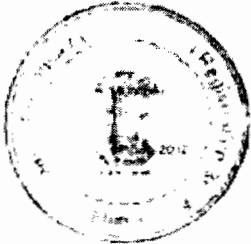
Public Ltd Co.

Others: Works Contract

* Refer to Annexure for Additional sheet of business.
Total no of Additional Price or Business: 2

1 Apr 2006

TRUE COPY
SHAMBUDDH...



SHAMBUDDH VASANT PATIL
Sales Tax Officer, (C 110),
Registration Branch, Mumbai
7 SEP 2012



[Handwritten signature]



[Handwritten signature]

VALECHA ENGINEERING LIMITED
Contractor

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

REG. NO. VAL. ENGRG. ACCOUNT NUMBER
AAACV22860



VALLECHA ENGINEERING LIMITED

08-03-1977

Philips

www.vallecha.com

VALLECHA ENGINEERING LIMITED
VALLECHA ENGINEERING LIMITED
VALLECHA ENGINEERING LIMITED
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VALLECHA ENGINEERING LIMITED
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VALLECHA ENGINEERING LIMITED



NO. 1-7774

**FRESH CERTIFICATE OF INCORPORATION
CONSEQUENT ON CHANGE OF NAME**

THE CHIEF ENGINEER OF THE RESISTANCE AND DEFENCE DEPARTMENT
BOMBAY

DO hereby certify that VALECHA ENGINEERING LIMITED
INCORPORATED IN INDIA

is a company incorporated under the provisions of section 21 of the Companies Act, 1956 (Act of 1956) and is a company registered with the Registrar of Companies, Bombay, under the provisions of the said Act, and that the said company was previously known as VALECHA ENGINEERING PRIVATE LIMITED

and that the said company was previously known as

and I hereby certify that the said company was previously known as FIFTH DAY OF MARCH, 1977

and that the said company was previously known as VALECHA ENGINEERING PRIVATE LIMITED

and that the said company was previously known as VALECHA ENGINEERING PRIVATE LIMITED

and that the said company was previously known as VALECHA ENGINEERING PRIVATE LIMITED

and that the said company was previously known as VALECHA ENGINEERING PRIVATE LIMITED

THIS CERTIFICATE IS VALID AS AT THE DATE OF ISSUANCE
Day of 15/03/77 at BOMBAY

[Signature]
CHIEF ENGINEER
BOMBAY



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)	
<p>Attached the Following Documents</p> <ul style="list-style-type: none"> ❖ Certificate of Incorporation ❖ Authorisation in the form of Power of Autorney to represent the firm or JV named in above, in accordance with ITB 20.2. ❖ In the case of government-owned entity, documents establishing legal and financial autonomy and compliance with commercial law, in accordance with ITB 4.5. 	



Technical Proposal

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



VALECHA ENGINEERING LIMITED
Contractor



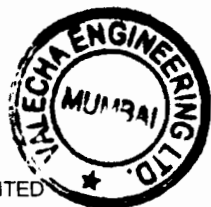
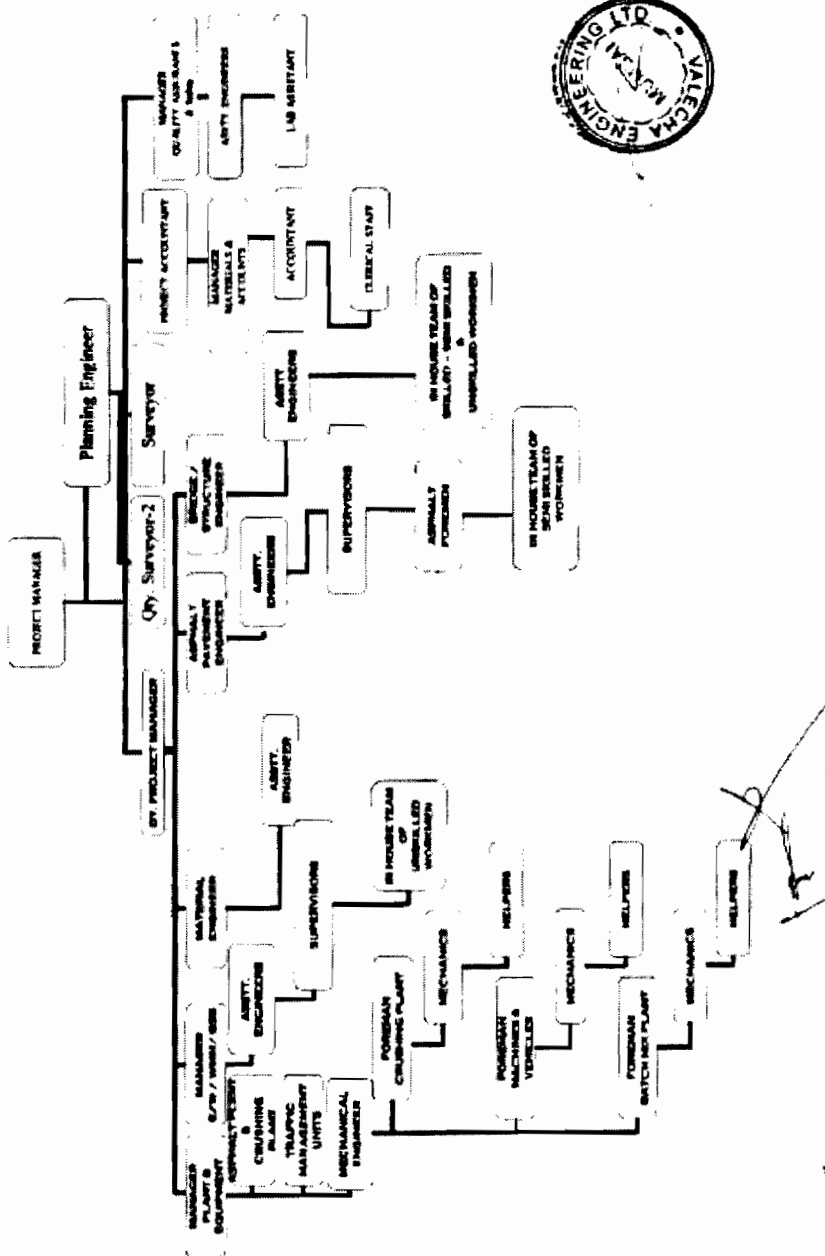
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Chief Engineer,
World Bank Projects, Odisha
Employer
Via the E.O.S.O. Odisha
Bhubaneswar.

Site Organization

VALECHA ENGINEERING LIMITED
STANDARD SITE ORGANIZATION CHART



Method Statement

1. Introduction:-

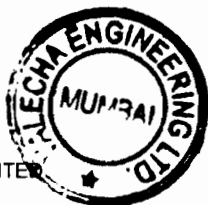
The section of Jagatpur to Duhuria Road (Km. 0/000 to Km. 49/000 of MDR is going to be widened from existing carriage to double lane (with paved shoulders as provided in the Drawings).

The work comprises of providing double lane carriage way with earthen and /or paved shoulders on either side. The principal items of work to be executed are Earthwork in embankment and sub-grade(using soil of 10% CBR), providing GSB, WMM, DBM, and BC including widening and/or new construction of CD works. The work shall be carried out with the moving traffic.

All the items of work shall be executed as per the Technical Specifications provided in the Contract.



VALECHA ENGINEERING LIMITED
Contractor



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Chief Engineer,
World Bank Projects, Odisha
Employer
Office: E.A.C. (Civil), Odisha
Bhubaneswar

Typical Organization:

A President (Projects) who reports to the Managing Director of the Company will head the project execution team. He shall be responsible for all administrative, contractual aspects, Quality Assurance and Health, Safety and Environment Monitoring of the project.

A General Manager will assist the President (Projects), with responsibility of Engineering, Procurement and Construction Management.

The Construction Team will be headed by a Project Manager who shall be a specialist Bridge Engineer. The Project Manager shall lead the construction team in their respective discipline.

The Project Manager shall be supported by Contract Managers and Site Engineers.

Planning Engineer shall be responsible for overall planning of works.

The Planning and Contract Manager shall be assisted by a team of Site Engineers and Quantity Surveyor.

REF: D:\FEND\SI\BAC\SI\IN\Methodology\Methodology 2009.doc





Quality Assurance Plan /
Quality Control:

A comprehensive Project Quality Assurance Plan shall be prepared by Project QA/QC in charge and submitted to client for approval.

Systems as per the approved Quality Assurance Plan shall be put in place before commencement of works.

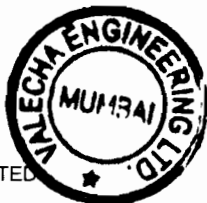
Compliance to the plan shall be ensured by frequent audits.

The QA/QC Engineer shall report to the Project Manager.

An independent laboratory from the approved list provided by the client shall be appointed to conduct the in-situ and laboratory tests. A self-sufficient lab shall be set up as a part of the project facilities to conduct field test. The lab shall be managed by an Engineer deputed by the approved with assistants provided by the Company.

The Project QA/QC Engineer shall coordinate all Quality Control activities in association with the Site Engineers.

VRP-D-TEND-SUBMISSION/Methodology/Methodology 2007.doc





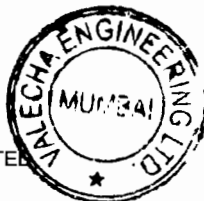
Health, Safety and Environment Plan:

An HSE plan shall be prepared by the HSE Engineer and submitted to client for approval. An approved HSE implementation and monitoring system shall be in place before commencement of works. The HSE plan shall include a Risk Hazard Analysis all activities anticipated in the project with plans mitigate the same. The plan shall be maintained as a live document and updated to include any additional activities during the course of the project.

The HSE Engineer shall report to the Project Manager. His responsibilities shall also include formation of Site Safety Committee, Chairing of Safety committee meetings, conducting induction programmed for staff, labour and equipment operators, conducting tool box meetings, ensuring compliance of approved safety plan and monitoring of Health and Environment at work site and camp.



VRP ID:19 NS-SUBMISSION Methodology Methodology 2009.doc





Execution Overview:

On award of contract, a detailed Level – 3 Project Execution Schedule shall be prepared showing the Engineering, Construction Operation and Handing over phase. Engineering phase shall be broken down to packages indicating the submission and approval process at various stages. The construction phase shall be broken down to various sections; the same shall also indicate the preparation and submission of construction method statement for various activities, utility diversion/protection proposals and approval process of the same.



VRP-D-TEND-SUBMISSION/Methodology/Methodology_7009.doc





DETAILS ABOUT QUALITY MANAGEMENT SYSTEM

Objective and Basic Principle:

One of the foremost objectives of quality assurance plan is to ensure strict adherence to quality standards, in relation to material and workmanship, in conformity with Technical Specifications and Tender Documents and to the entire satisfaction of the "Engineer". Basic principle followed is to ensure a job, which satisfy objectives behind the specifications laid. The three important constituents recognized are -

- i Preliminary survey and investigations
- ii Laboratory testing and evaluation
- iii Site Quality Control

Procedure for Implementation:

Implementation of Quality Control System is a joint responsibility of VALECHA ENGINEERING LIMITED (Construction Wing) and execution and Quality Assurance Department (EQAD). EQAD is headed by a qualified and experienced Civil Engineer and is made to function directly under the Project Manager of the work.

EQAD functions in interaction with construction wing and head of the EQAD are assisted by a number of trained and experienced laboratory assistance and technicians responsible for laboratory and in situ testing operations.

The functions of EQAD have been established as under

- i Identification of source of material for construction work. Sampling of the materials and laboratory testing to evaluate their suitability for the works.
- ii Routine sampling of the materials to be used in the permanent works jointly with Engineer's representatives.
- iii Laboratory testing of Samples received from site.
- iv Equipping the field Engineer's to carry out basic tests at field levels and provide training in methodologies, if required.
- v Maintenance records of test result and quality control observations and their onward transmission to the Project Manager.
- vi Statistical analysis of test results. Study & preparation of reports to further enhance the quality standards.
- vii Checking of application and efficiency of control system and taking necessary corrective measures required.

Methods:

One central laboratory will be established at one location. The laboratory will house all necessary equipments and instruments for conducting day to day tests on embankments / sub base soils, aggregates, sand, masonry stone, cement, bitumen, cement concrete, cement mortar, bitumen mixes, asphalt mixes etc. as specified in contract. Field-tests for different activities shall be conducted by the respective Site Engineers.

EQAD will provide facility for the following tests

<p>1 Test on Soil/Sub base material</p> <ul style="list-style-type: none"> i Grain size ii Atterburg's limits iii Proctor Density iv Field density (Field test) v CBR test vi Rapid moisture determination 	<p>2 Test on Aggregate</p> <ul style="list-style-type: none"> i Impact value ii Gradation or sieve analysis iii Water absorption, specific gravity and bulk density iv Flakiness index and elongation tests v Soundness tests vi Striping value vii Sand Equivalent test viii Stone Polishing value
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CERTIFICATE OF REGISTRATION

VALECHA ENGINEERING LIMITED

**ADDRESS:- VALECHA CHAMBERS, 4TH FLOOR, NEW LINK ROAD, ANDHERI (WEST),
MUMBAI - 400063**

Certificate No: QA / IND / 0478

Here in after called the company, the right to be listed in the Directory of Registered Companies in respect of the services listed below. These services shall be offered by the QA TECHNIC from only the address given below in accordance with the quality management system in compliance with ISO 9001:2008

ISO 9001:2008

**CONTRACTS AND EXECUTION OF INFRASTRUCTURAL CONSTRUCTION PROJECTS LIKE
ROADS, FLYOVERS, BRIDGES, TUNNELS, RUNWAYS, DAMS, BARRAGES, WATER
CANALS AND WORKS LIKE DIAPHRAGM WALLS, HYDRAULIC
ROTARY PILED FOUNDATION AND BUILDING WORKS**

**OUT OF SCOPE: 1A
EA 28**

Further clarifications regarding the scope of this certificate of ISO 9001:2008 requirements may be obtained by consulting the organization

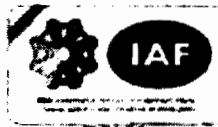
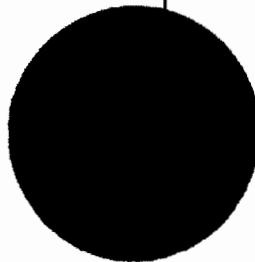
Certificate Issue Date : 1st June 2012

Certificate Expiry Date : 1st June 2015

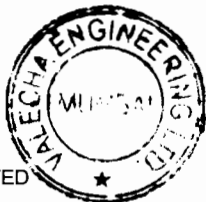
Date of Initial Registration : 1st June 2009

Re-assessment Period : 3 Years

**General Manager
Latif Murat YILMAZ**



ALBERT QA INTERNATIONAL TECHNICAL
CONTROL AND CERTIFICATION LTD
Tel : +90 216 572 49 10-11-12
Fax : +90 216 572 49 14
www.aqsterbest.com





CERTIFICATE OF REGISTRATION

VALECHA ENGINEERING LIMITED

ADDRESS: VALECHA CHAMBERS, 4TH FLOOR, NEW LINK ROAD, ANDHERI (WEST), MUMBAI - 400063

Certificate No: QAIND/14001/0024

Here in after called the company, the right to be listed in the Directory of Registered Companies in respect of the services listed below. These services shall be offered by the QA TECHNIC from only the address given in accordance with the environmental management system in compliance with ISO 14001:2004.

ISO 14001:2004

CONTRACTS AND EXECUTION OF INFRASTRUCTURAL CONSTRUCTION PROJECTS LIKE ROADS, FLYOVERS, BRIDGES, TUNNELS, RUNWAYS, DAMS, BARRAGES, WATER CANALS AND WORKS LIKE DIAPHRAGM WALLS, HYDRAULIC ROTARY PILED FOUNDATION AND BUILDING WORKS.

EA 28

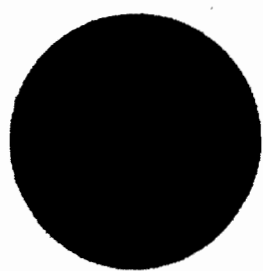
Further clarification regarding the scope of this certificate of ISO 14001:2004 requirements may be obtained by consulting the organization.

Certificate Issue Date : 10th August 2012
Date of Initial Registration : 1st August 2009

Certificate Expiry Date : 10th August 2015
Re-assessment Date : 3 Years

General Manager
Latif Murali PLMAZ

ALBERE QA INTERNATIONAL TECHNICAL CONTROL AND CERTIFICATION LTD.
www.albereqa.com
Tel : +91 8216 872 49 10-11-12
Fax : +91 8216 872 49 14



VALECHA ENGINEERING LIMITED
Contractor



Chief Engineer,
World Bank Projects, Odisha
Employer
Water Resources Dept., Odisha
Government
Bhubaneswar



CERTIFICATE OF REGISTRATION

VALECHA ENGINEERING LIMITED

ADDRESS: VALECHA CHAMBERS, 4TH FLOOR, NEW LINK ROAD, ANDHERI (WEST), MUMBAI - 400063

Certificate No: QA/TND/18001/8005

Here in after called the company, the right to be listed in the Directory of Registered Companies in respect of the services listed below. These services shall be offered by the QA TECHNIC from only the address given below in accordance with the occupational health & safety management system in compliance with OHSAS 18001:2007

OHSAS 18001:2007

CONTRACTS AND EXECUTION OF INFRASTRUCTURAL CONSTRUCTION PROJECTS LIKE ROADS, FLYOVERS, BRIDGES, TUNNELS, RUNWAYS, DAMS, BARRAGES, WATER CANALS AND WORKS LIKE DIAPHRAGM WALLS, HYDRAULIC ROTARY FILED FOUNDATION AND BUILDING WORKS.

EA 28

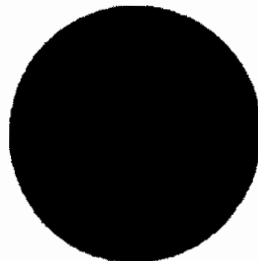
Further clarifications regarding the scope of this certificate of OHSAS 18001:2007 requirements may be obtained by consulting the organization

Certificate Issue Date : 10th August 2012
Date of Initial Registration : 1st August 2009

Certificate Expiry Date : 10th August 2015
Re-assessment Period : 3 Years

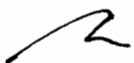
General Manager
Latif Murtaza YILMAZ

ALBERK QA INTERNATIONAL TECHNICAL CONTROL AND CERTIFICATION LTD.
Tel : +91 216 972 49 10-11-12
Fax : +91 216 972 49 14
www.qacertindia.com



Mobilization Schedule

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



VALECHA ENGINEERING LIMITED
Contractor



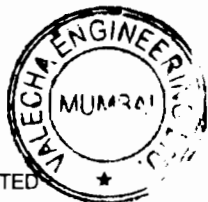
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Chief Engineer,
World Bank Projects, Orissa
Employee
for the L.N.Civil, Odisha
Bhubaneswar
1000000

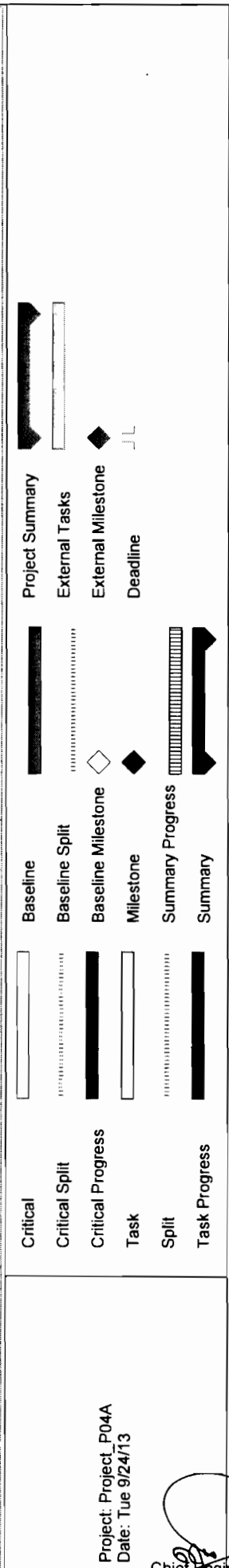
CONSTRUCTION SCHEDULE


VALECHA ENGINEERING LIMITED
Contractor




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

ID	Task Name	Duration	Start	Finish	2014				2015				2016				2017	
					Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1
1	Mobilization	60 days	Tue 9/24/13	Sat 11/23/13														
2	Section I : 11.850 km	304 days	Fri 11/1/13	Sat 11/29/14														
3	Site Clearance	30 days	Fri 11/1/13	Sun 12/1/13														
4	Earth Work	180 days	Thu 11/7/13	Tue 5/6/14														
5	SubBase	200 days	Fri 11/22/13	Tue 6/10/14														
6	GSB	200 days	Wed 11/1/14	Fri 10/17/14														
7	WMM	200 days	Mon 1/6/14	Wed 10/22/14														
8	DBM	200 days	Tue 1/14/14	Thu 10/30/14														
9	BC	100 days	Sat 5/24/14	Sat 11/29/14														
10	CD Works	280 days	Mon 11/11/13	Sat 11/15/14														
11	Retaining , Drainage Sirt	280 days	Mon 11/11/13	Sat 11/15/14														
12	Road Safety Amenities	60 days	Tue 9/30/14	Sat 11/29/14														
13	Maintenance	320 days	Fri 11/8/13	Mon 12/22/14														
14	Environmental Measures	320 days	Fri 11/8/13	Mon 12/22/14														
15	Section II : 11.000 km	327 days	Sat 3/1/14	Tue 4/21/15														
16	Site Clearance II	30 days	Sat 3/1/14	Mon 3/31/14														
17	Earth Work II	180 days	Fri 3/7/14	Mon 12/1/14														
18	SubBase II	200 days	Sat 3/22/14	Mon 1/5/15														
19	GSB II	200 days	Thu 5/1/14	Sat 2/14/15														
20	WMM II	200 days	Tue 5/6/14	Thu 2/19/15														
21	DBM II	200 days	Wed 5/14/14	Fri 2/27/15														
22	BC II	100 days	Fri 12/19/14	Sun 3/29/15														
23	CD Works II	270 days	Tue 3/11/14	Thu 3/5/15														
24	Retaining , Drainage Sirt II	280 days	Tue 3/11/14	Sun 3/15/15														
25	Road Safety Amenities II	60 days	Wed 1/28/15	Sun 3/29/15														
26	Maintenance II	320 days	Sat 3/8/14	Tue 4/21/15														
27	Environmental Measures II	320 days	Sat 3/8/14	Tue 4/21/15														



ID	Task Name	Duration	Start	Finish	2014				2015				2016				2017				
					Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	
28	Section III : 13.750 km	327 days	Tue 7/1/14	Thu 11/5/15																	
29	Site Clearance III	30 days	Tue 7/1/14	Wed 10/15/14																	
30	Earth Work III	180 days	Sun 9/21/14	Fri 3/20/15																	
31	SubBase III	200 days	Mon 10/6/14	Fri 4/24/15																	
32	GSB III	200 days	Sat 11/15/14	Wed 6/3/15																	
33	WMM III	200 days	Thu 11/20/14	Mon 6/8/15																	
34	DBM III	200 days	Fri 11/28/14	Tue 6/16/15																	
35	BC III	100 days	Tue 4/7/15	Tue 10/13/15																	
36	CD Works III	270 days	Thu 9/25/14	Sat 9/19/15																	
37	Retaining , Drainage Sirt III	280 days	Thu 9/25/14	Tue 9/29/15																	
38	Road Safety Amenities III	60 days	Sun 5/17/15	Tue 10/13/15																	
39	Maintenance III	320 days	Mon 9/22/14	Thu 11/5/15																	
40	Environmental Measures III	320 days	Mon 9/22/14	Thu 11/5/15																	
41	Section IV : 12.400 km	327 days	Sat 11/1/14	Tue 12/22/15																	
42	Site Clearance IV	30 days	Sat 11/1/14	Mon 12/1/14																	
43	Earth Work IV	180 days	Fri 11/7/14	Wed 5/6/15																	
44	SubBase IV	200 days	Sat 11/22/14	Wed 6/10/15																	
45	GSB IV	200 days	Thu 1/1/15	Sat 10/17/15																	
46	WMM IV	200 days	Tue 1/6/15	Thu 10/22/15																	
47	DBM IV	200 days	Wed 1/14/15	Fri 10/30/15																	
48	BC IV	100 days	Sun 5/24/15	Sun 11/29/15																	
49	CD Works IV	270 days	Tue 11/1/14	Thu 11/5/15																	
50	Retaining , Drainage Sirt IV	280 days	Tue 11/1/14	Sun 11/15/15																	
51	Road Safety Amenities IV	60 days	Wed 9/30/15	Sun 11/29/15																	
52	Maintenance IV	320 days	Sat 11/8/14	Tue 12/22/15																	
53	Environmental Measures IV	320 days	Sat 11/8/14	Tue 12/22/15																	
54	Completion	30 days	Sat 1/2/16	Sun 1/31/16																	

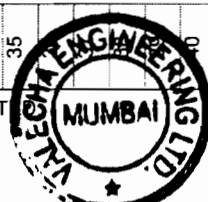
Project: Project_P04A
Date: Tue 9/24/13

[Signature]
Chief Engineer

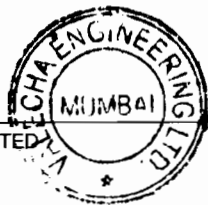
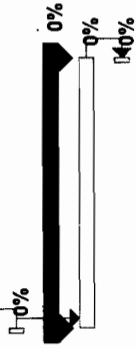
World Bank Projects, Odisha
Employer
World Bank Project
to the E.I.C.(Civil), Odisha
Bhubaneswar

Legend:

- Baseline
- Baseline Split
- Critical Progress
- Task
- Split
- Task Progress
- Project Summary
- External Tasks
- External Milestone
- Deadline



ID	Task Name	Duration	Start	Finish	2014				2015				2016				2017								
					Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4						
55	Misc works	30 days	Sat 1/2/16	Sun 1/31/16																					
56	Hand over	7 days	Mon 1/25/16	Sun 1/31/16																					
57	Defect Liability Period	365 days	Mon 2/1/16	Mon 1/30/17																					
58	DLP	365 days	Mon 2/1/16	Mon 1/30/17																					
59	Close Contract	7 days	Tue 1/24/17	Mon 1/30/17																					

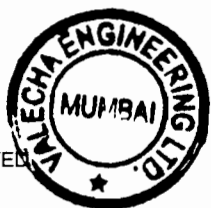


Project: Project_P04A Date: Tue 9/24/13		<ul style="list-style-type: none"> Project Summary External Tasks External Milestone Deadline Baseline Baseline Split Baseline Milestone Milestone Summary Progress Summary
	<ul style="list-style-type: none"> Critical Critical Split Critical Progress Task Split Task Progress 	

Equipment Schedule as per Requirement of Bidding Document

The Bidder shall demonstrate that it has the key equipment listed hereafter:

No.	Equipment Type and Characteristics	Minimum Number required
1	Mechanical Bitumen Sensor Paver - 100 TPH	01
2	Motor Grader - 200 cum/Hr	02
3	Hydraulic Excavator - 60 cum/Hr	02
4	Vibratory Roller (Tandem) - 8 T [100 cum/Hr]	03
5	Pneumatic Tyred Roller - 25 cum/Hr	01
6	Hot Mix Plant (Batch Mix only) - 100 TPH	01
7	Concrete Batch-mix Plant - 75 Cum/Hr	01
8	Transit Mixer - 6 cum	05
9	Front End Loader	03
10	Dozer - 150 cum/Hr	01
11	Tipper (of different capacities)	30
12	Cone Crushing Unit - 200 TPH	01
13	Bitumen Sprayer - 1750 sqm/hour	01
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



**PLANTS AND EQUIPMENTS OWNED AND PROPOSED FOR THE PROJECT
BY M/s Valecha Engineering Limited, Mumbai.**

1.

Item of equipment:- MECHANICAL BITUMEN SENSOR PAVER - 1 No.		
Equipment information	Name of manufacturer: Apollo	Model and power rating AP-600
	Capacity 600 TPH	Year of manufacture 2010
Current status	Current location Srinagar	
	Details of current commitments Srinagar	
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 – 2 Nos.		
Equipment information	Name of manufacturer L&T	Model and power rating GA-511 A-1
	Capacity 200 Cum/Hr	Year of manufacture 2001, 2004
Current status	Current location Pune, Mizoram, Sonapat	
	Details of current commitments Pune, Mizoram, Sonapat road projects	
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 - 2 Nos		
Equipment information	Name of manufacturer Tractor India Limited	Model and power rating 320CL
	Capacity 60 Cum / hour	Year of manufacture 2006
Current status	Current location Mizoram	
	Details of current commitments Mizoram State Highway	
Source	Indicate source of the equipment <input checked="" type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	

VALECHA ENGINEERING LIMITED
Contractor



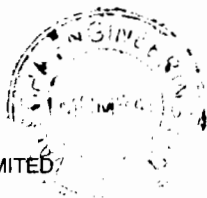
Chief Engineer,
World Bank Projects, Odisha
Employer
Bhubaneswar

4.

Item of equipment: Vibratory Roller (Tandem) - 3 Nos		
Equipment information	Name of manufacturer Ingersoll Rand	Model and power rating DD-90
	Capacity 8 T(1000Cum/Hr)	Year of manufacture 2006, 2007
Current status	Current location Chittorgarh Bypass	
	Details of current commitments Chittorgarh Bypass NHA1 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 - 1 Nos		
Equipment information	Name of manufacturer Ingersoll Rand	Model and power rating -
	Capacity 25 Cum/Hr	Year of manufacture 2007
Current status	Current location Sonepat	
	Details of current commitments Haryana Sonepat Road	
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 with Electronic Sensor – 1 No		
Equipment information	Name of manufacturer Zhenjiang Co., China	Model and power rating LIB -1500
	Capacity 125 TPH	Year of manufacture 2007
Current status	Current location Haryana	
	Details of current commitments Haryana Sonapat Road	
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.

Item of equipment: Concrete Batching Plant –		
Equipment information	Name of manufacturer Zhenjiang Huachen Huatong Road Machinery Co. Ltd.	Model and power rating MODU 150
	Capacity 150 Cum / Hr.	Year of manufacture 2006
Current status	Current location Pune	
	Details of current commitments Pune Concrete Road 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 – 5 NOS		
Equipment information	Name of manufacturer GREAVES, Ashok Leyland, AMW	Model and power rating
	Capacity 06 CUM	Year of manufacture 2008, 2007
Current status	Current location DELHI	
	Details of current commitments Pramukh Road over Bridge Work	
Source	Indicate source of the equipment <input checked="" type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	

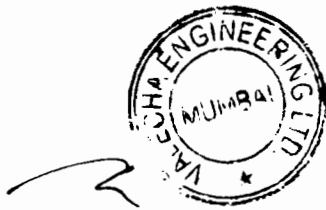


9.

Item of equipment: FRONT END LOADER – 2 NOS		
Equipment information	Name of manufacturer CATERPILLAR	Model and power rating Hindustan 2021z
	Capacity -	Year of manufacture 2006
Current status	Current location Pune	
	Details of current commitments Pune Municipal Roads	
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.

Item of equipment: DOZER - 1 NO.		
Equipment information	Name of manufacturer -	Model and power rating -
	Capacity 150 cum/hr	Year of manufacture -
Current status	Current location Pune	
	Details of current commitments Pune Municipal Roads	
Source	Indicate source of the equipment <input type="checkbox"/> Owned <input checked="" type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	



WORK ORDER

Ref: WO/Hire/Orissa/Dozer/Sunrise Earthmovers- 0015

24th May, 2013

To

SUNRISE EARTHMOVERS

Sion Trombay Road, opp. Bezzola
Complex,
Near Suman Nagar,
CHEMBUR,
MUMBAI-400071

Mob: Anil Chawla Proprietor

Dear Sir,

Sub: Hiring of One no. BULLDOZER CATERPILLAR D8H for our Orissa Road Project Jagatpur to Duhuria Works Site

With reference to your offer vide E-mail dated 03.05.2013, and the negotiations you had with the undersigned, we are pleased to award this contract to you for hire of your Bulldozer as per the description and terms and conditions as mentioned below:

1 DESCRIPTION OF MACHINERY AND HIRE CHARGES:

1 No. BULLDOZER CATERPILLAR D8H @ Rs. 5,75,000/- Per Month of flexible 300 hours working in day and night shifts. The above hire charges are inclusive of the cost of operators in both the shifts, who shall be available at the site of work at and for any time as per our requirement.
Service Tax @ 12.36% shall be paid extra by us.
The above charges are inclusive of all other taxes / Government levies /Permit and License fees payable, if any, on the dozer / hire charges.

2 ACCESSORIES

A Ripper attachment at the rear for boulders buried if any

3 SHIFTS & WORKING HOURS

The above monthly charges are on the basis of working for 24 hours per day and 26 days per month inclusive of Lunch break of 1 hour and Dinner break of 1 Hour per day. Charges for working for extra hours in excess of 300 hours per month will be paid extra on pro-rata basis.

4	FUEL AND LUBRICANTS
	The above charges are exclusive of diesel, engine oil and grease required for operation and lubrication of the dozer for smooth operation and the same will be supplied by us at our cost (top up only). Fuel consumption shall be fixed after joint monitoring by the people at site on the basis of entries of fuel supply / consumption in the Daily Log-book. However, any excessive consumption above the norms due to any reason such as poor maintenance / defectives parts or due to pilferage, theft etc. will be debited to your account.
5	SAFETY REGULATIONS
	The contract is subject to safety regulations wherein Reverse Alarm, Strobe Light and Night Lighting are mandatory requirements on the Dozer and shall be approved for safe operation by Inspector appointed by the respective Client. Additional safety features if required shall be provided at no extra cost to us.
6	TRANSPORTATION
	Part of Mobilization charges not exceeding Rs.1,20,000.00 (Rupees One Lakh Twenty Thousand only) , and additional detention charges if any, at the loading end shall be entirely to your account. De-mobilization beyond Six months the charges for demobilizing shall be to your account. In case of premature termination of the contract for reasons as mentioned in clause 14b, 14c and 14d the return freight shall be to your account. We may, at our discretion, shift the Dozer to any other location at Site and the cost of such shifting including the time required for actual shifting will be to our account.
7	PERFORMANCE
	The performance of the dozer shall be as per the capacity and availability of 85% uptime is expected. We reserve our right to claim compensation or to terminate the contract without any liability on us if the performance is not found to the satisfaction of the site.
8	BREAK -DOWN & MAINTENANCE
	You shall ensure that the dozers are regularly and continuously maintained. Running maintenance shall, as far as possible, be carried during non-operating hours like Sundays and holidays with permission of our site officer at the site. You shall be allowed maximum 24 hours' idle time per month cumulatively towards break down. If the total break-down time in a month exceeds 24 hours then the time in excess of 24 hours will be deducted from your monthly hire charges, on pro rata basis. In case of a major break-down, you shall immediately arrange for the replacement. In case you fail to make the replacement within a reasonable time (to be decided by our Site officer) we shall arrange such replacement at any rate prevailing at that particular time and the entire cost of such replacement and the hire charges for the period of replacement shall be recovered from your bills / retention amount.

9	PERIOD OF CONTRACT
	<p>This contract will be valid for an initial period of 08 (Eight) months with an option to extend for a further suitable period at same rates, for which we will give you at least 30 days' advance notice.</p> <p>The entitlement of hire charges shall commence only on the satisfaction of our Site in Charge that the dozer has been received in good operating condition and is commissioned satisfactorily.</p>
10	INSURANCE
	You shall arrange a suitable insurance cover for your dozer and for your operators / supervisors/ workers deputed at our site for operation / maintenance/ supervision of the dozer.
11	ACCOMMODATION
	We shall arrange to provide at / nearby our site labour type accommodation for your operators and other staff which will be necessary for operation of the dozer.
12	LOG-SHEET AND ATTENDENCE
	<p>You shall arrange to maintain at the site a daily Log-Sheet which shall be daily signed by your Dozer operator and our site officer confirming the daily working hours, fuel consumption etc. of the dozer.</p> <p>Further, you shall ensure that the operator and other concerned staff are available at the site exactly as per our requirements. Any loss of operating time due to absence / late reporting of the operator / other staff shall not be counted for calculation of the hire charges.</p>
13	BILLING , PAYMENT AND RETENTION MONEY
	<p>You shall submit your hire bills/ Tax Invoices on monthly basis before 10th of every calendar month.</p> <p>The bills should be submitted to our Site with all necessary supporting documents/ reports.</p> <p>Payment against the same will be released by our Site, in 30 days.</p>
14	TERMINATION
	<p>We shall be entitled for premature termination of this contract on the basis of any one or more of the following reasons</p> <ol style="list-style-type: none"> a. Two week's written notice from either side b. Improper behavior of your operators / labours or other staff c. Unsafe practices by operators d. Continued/frequent break-downs and unsatisfactory performance of the dozer. e. Work gets suspended or terminated

15	GOVERNMENT LEVIES
	You shall arrange for all necessary Government Levies, permits, licenses, taxes etc, in respect of the dozer and its operation, at your cost. You shall ensure that our site operations do not suffer due to failure / delay on this account.
16	SETTLEMENT OF DISPUTES
	Any disputes in respect of the execution / interpretation of this contract shall be amicably settled by the senior officials of both the parties.
17	JURISDICTION
	This contract is subject to Mumbai Court jurisdiction.

Please sign (with seal of your firm) the enclosed duplicate of this agreement in token of your acceptance of the above terms and conditions, and arrange to send back the same to us at the earliest.

Thanking you,

For **Valecha Engineering Limited**

Confirmed and Accepted

For **Sunrise Earthmovers**

Anil Chawla
Proprietor

with
C.M.Vidhushekharan
Manager (Purchase)



11.

Item of equipment: TIPPERS – 30 NOS		
Equipment information	Name of manufacturer Unitech, Tata, Ashok Leyland	Model and power rating -
	Capacity 08 Cum	Year of manufacture 2006
Current status	Current location Various Location	
	Details of current commitments W-255 Road work, Kota, Mizoram, Delhi	
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: CONE CRUSHING UNIT- 1 NO		
Equipment information	Name of manufacturer Voltas	Model and power rating MC2XA4005-II
	Capacity 200 TPH	Year of manufacture 2011
Current status	Current location Bhuj	
	Details of current commitments Bhuj Bachau Road	
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 Apollo	Model and power rating -
	Capacity 1750 m²/hr.	Year of manufacture 2009
Current status	Current location Mizoram, Pune	
	Details of current commitments Mizoram State Highway, Pune Road	
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: EARTH COMPACTOR - 3 Nos		
Equipment information	Name of manufacturer Cosmos	Model and power rating -
	Capacity 8-10 TON	Year of manufacture 2006
Current status	Current location Pune, Mizoram	
	Details of current commitments Road Works – Pune, Mizoram	
Source	Indicate source of the equipment <input checked="" type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	



Ingersoll-Rand (India) Ltd
 PHASE I, PEEPIYA INDUSTRIAL AREA
 BANAJI CHATE ROAD
 TEL: 22192900 TO 22192510 FAX: 9844-5020
 FAX: 28994651 GRAVE INGENSRIER
 E-MAIL

REGISTRATION NO. 1805
 BILL OF SALE / TAX INVOICE

VALECHA ENGINEERING LTD
 VALECHA CHAMBERS, 7TH FLOOR
 PLOT NO. B-6, ANDHERI NEW LINK
 ROAD, ANDHERI (W)
 MUMBAI 400052

NO. DATE
 P0036 31/10/2006
 AUTHENTICATION
 ORIGINAL FOR BUYER

VALECHA ENGINEERING LTD
 ALZAM-WUJIFANG SECTION
 OF ALZAM-THENZAL-LUNGEI
 ROAD VIA WUJIFANG,
 ALZAM
 CONSIGNEE EGYPT

CLIENT'S NO. P07ALZAM/IR-SD-176 DT:31/08/06
 INVOICE NO. P5007623
 IN ADDRESS NO. 8430
 SUB IN ADDRESS NO. 8430.6100
 SAVANI TRANSPORT LTD
 CONSIGNEE TIN: IS120860033
 DATE OF REMOVAL 31/10/2006
 TIME OF REMOVAL 21:11 HRS

AS DETAILED IN ORDER

CONSIGNEE LIST:
 CONSIGNEE EGYPT

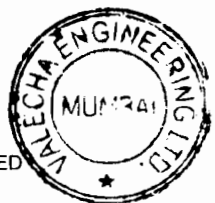
DESTINATION	DATE	ORDER NO.	CLST CODE	PROD CODE
ITALY		0150062	C02231	10

QTY	DESCRIPTION OF GOODS	UNIT RATE	AMOUNT
1	INGERSOLL RAND MODEL SD-110 VIBRATOR+ SOIL COMPACTOR S/N NO. 06 110 10 800 1 SET KEYS, 1 FREE SERVICE COMPON NO. 01012 1 SET INSTRUCTION MANUAL, PARTS DATA, 05 TEST CERTIFICATE, BATTERY CARD 1 KIT TOOL SK100, 1 KIT TOOL SPECIAL 1 BAGHP AIR TYPE PRESSURE 0-120 PSI 2 MIRROR COMPACTORS 1 MANUAL INSTRUCTION AND PARTS 00110 6 STOPPER M/C TRANSPORT 2 KIT SERVICE 000MS 150100 COMPLETE "EXERCISE DUTY EXEMPTED VIDE NOTIFICATION NO. 108/95 AND SUBSEQUENT AMENDMENTS" ONE COMPACTOR / THREE CARDBOARD BOXES / ONE KEY PURSE WITH KEY B/LR NO: P5007623/545	1758000.00	0.001 1758000.00

Bank of Baroda
 Branch: ...
 Account No: ...
 Date: 31/10/2006

DESCRIPTION	TOTAL
Free Paid Bill Customer	1758000.00
GST @ 4%-Ag. Form C/D no.	76320.00
TOTAL	1834320.00

DISPUTES ARISING OUT OF THIS TRANSACTION ARE SUBJECT TO JURISDICTION OF BANK OF BARODA
 INGERSOLL-RAND (INDIA) LIMITED
 AUTHORIZED SIGNATORY



IR Ingersoll Rand
 Ingersoll Rand (India) Limited
 PLEERVA INDUSTRIAL AREA
 PLOT NO. 9-6, ANDHERI NEW LANE
 ROAD, ANDHERI (W)
 MUMBAI - 400 053

VALECHA ENGINEERS LTD
 VALECHA CHAMBERS, 7TH FLOOR
 PLOT NO. 9-6, ANDHERI NEW LANE
 ROAD, ANDHERI (W)
 MUMBAI - 400 053

VALECHA ENGINEERING LTD
 ATZMAL - HINDIYANG SECTION
 OF ATZMAL - THENZVAL - LUNGET
 ROAD VIA HUIYANG,
 ATZMAL -

BILL OF SALE / TAX INVOICE
 NO: 07PA0199
 DATE: 26 05/2006

KST - 00800238 Dated 15-4-77
 CST - 00850238 Dated 15-4-77
 TIN - 28790099272

EXCISE NO: PD/ATZMAL/IR. 60-110/008 DT. 13/04/06
 PREL. NOTE NO: PS006487
 H.A. APPROV. NO: B430
 SERIAL NO. B430-100
 Ravi Transport services

DATE OF REMOVAL: 26/05/2006
 TIME OF REMOVAL: 18:18:18

As Detailed in Order		Consignee LST- Customer CST			
DESCRIPTION	QUANTITY	UNIT RATE	TOTAL	TAX	AMOUNT
ATZMAL	LR NO. 10668 dt. 26/05/06		B150031	C02231	10

QTY	DESCRIPTION	UNIT RATE	TOTAL	TAX	AMOUNT
1	INGERSOLL RAND MODEL 60-110 VIBRATORY SOIL COMPACTOR S/N NO. 06 110 05 641 1 SET KEYS, 1 FREE SERVICE COUPON NO. 01132 1 SET INSTRUCTION MANUAL, PARTS CATALOG TEST CERTIFICATE, BATTERY CARD 1 SET TOOL 60100, 1 KIT TOOL: SPECIAL 1 GAUGE AIR TYPE PRESSURE / 0-120 PSI 1 TIRED CONDUCTIONS 1 MANUAL INSTRUCTION AND PARTS 60110 1 KIT SERVICE 300HRS, AS 100 COMPLETE *EXCISE DUTY EXEMPTED VIDE NOTIFICATION NO. 108/95 AND SUBSEQUENT AMENDMENTS* ONE COMP. TOP / 2 CARDBOARD BOXES ONE KEY RISE S.P. NO: 006487/4/4	1758000.00	0.001	1758000.00	

IN WORDS: Rupees Zero and Zero Paise
 Method of Payment: ROAD
 Date: 26/05/2006
 Time: 18:30 MRS
 EXCISE DUTY IN WORDS: Rupees Zero and Zero Paise

Pre-Paid Bill Customer	TOTAL	1758000.00
CST @ 4% on	1758000.00	70320.00
FREIGHT		123672.00
INVOICE TOTAL		1951952.00
NET PAYABLE		1951952.00

DISPUTES ARISING OUT OF THIS TRANSACTION ARE SUBJECT TO JURISDICTION OF BANGALORE
 INGERSOLL RAND (INDIA) LIMITED

VALECHA ENGINEERING LIMITED
 Contractor



Chief Engineer,
 World Bank Projects, Odisha
 Employer

World Bank Project
 Odisha
 Bhubaneswar

VOLVO

BILL OF SALE / TAX INVOICE

VOLVO INDIA PVT. LTD., Plot No. 7, 8 & 12, Phase I, Peenya Industrial Area, Bangalore - 560 058.

VALECHA ENGINEERING LTD VALECHA CHAMBERS, 7TH FLOOR PLOT NO. B-6, ANDHERI NEW LINK ROAD, ANDHERI (W) MUMBAI - 400 053 W/C/SRE Infrastructure Finance Ltd.		NO 08VA0941	DATE 29/03/2008	KST : 00408580 CST : 00458582 TIN : 29910140792	ECC NO : A-ACV6747KXMO08 ST GOLD CARD NO : 399-EXP
CONSIGNEE VALECHA ENGINEERING LTD S.NO. 396, KATHEWADI, NEAR SONY GODOWN, PUNE NAGAR RD, LDNIKAND TAL:HAVELI, DIS:PUNE PUNE -		CUST P.O NO PD/CAP/SD-110/COMPACTOR/PUNE(110707)VOLVO/0E1 DT:07/02/08 PKG NOTE NO P5010340 HEADING NO 8430 SUB HEADING NO 8430.6100 SOUTH EASTERN ROADWAYS		DATE OF REMOVAL TIME OF REMOVAL	
TERMS As Detailed In Order		Consignee TIN- 27350000483V Division : The Dy. Commissioner of Central Excise, Large Tax Payers Unit, JSS Towers, 100 Ft Ring Road, Banashankari III Stage, Bangalore - 560 085		Range : Superintendent of Central Excise, Large Tax Payers Unit, JSS Towers, 100 Ft Ring Road, Banashankari III Stage, Bangalore - 560 085	
		Consignee LST- 27350000483V Consignee CST- 27350000483C			

DESTINATION	DESPATCH DETAILS	DATE	ORDER NO	CUST CODE	PROD CODE
PUNE	LR NO. 1233713 Dt. 29/03/08		8450029	002231	10

QUANTITY	DESCRIPTION OF GOODS	UNIT RATE	AMOUNT	
1	70913009 VOLVO MODEL SD110 VIBRATORY SOIL COMPACTOR SL.NO. 09 110 03 1358 1 SET KEYS, 1 FREE SERVICE COUPON NO.01968 1 SET INSTRUCTION MANUAL, PARTS CATALOG TEST CERTIFICATE, BATTERY CARD 1 KIT TOOL SD100, 1 KIT TOOL:SPECIAL 1 GAUGE AIR TYRE PRESSURE(0-120 PSI) 2 MIRROR COMPACTORS, 6 STOPPER M/C TRANSPORT 1 MANUAL PARTS SD110 SOIL COMPACTOR 1 MANUAL OPERATION AND MAINTENANCE SD110 3 KIT SERVICE 250HRS.1SD110 ONE COMPACTOR/1 C.BOX/1 KEY PURSE BLR NO: P5010340/375	1830000.00	0.00%	1830000.00

Certified that the particulars given above are true & correct of the amount indicated represents the price actually charged & that there is no flow of additional consideration directly or indirectly, from the buyer.	FREIGHT To - Pay	TOTAL	1830000.00
Excise Duty Paid in words Rupees Two Lakh Fifty Six Thousand Two hundred Only	EXCISE DUTY @ 14% on 1830000.00 Cess on ED @ 2% on 256200.00 Higher Edu.Cess @ 1% on 256200.00 CST @ 3%-Ag. Form C/D on 2093886.00	256200.00 5124.00 2562.00 62817.00	1830000.00 256200.00 5124.00 2562.00 62817.00
RG23/A/C/PART II/PLA ENTRY NO Mode of Transport : Road If by Motor Vehicle, its Regn. No. : Date of Prep : 29/03/2008 Time of Prep : 12:01 HRS Place : BANGALORE	CESS ON EXCISE DUTY IN WORDS Rupees Five Thousand One hundred Twenty Four Only SEC ON EXCISE DUTY IN WORDS Rupees Three Thousand One hundred Fifteen Only		

Please take care of the Transit Insurance of the Consignment as per our Intimation of Date.	INVOICE TOTAL LESS ADVANCE ADJUSTED NET PAYABLE	2186000.00 2156703.00 222553.00 1934150.00
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PURCHASE ORDER

Ref: PO/CAP/SOIL COMPACTOR/ETAWAH (224213)/WIRTGEN/008 Date: 18-06-2013

To:

WIRTGEN INDIA PRIVATE LIMITED
Branch Address:
A/38, Road No.11, Behind Passport Office,
Wagle Industrial Estate, Thane (West) 400604.

Tel:	022-4123 7064 / 65
Fax:	022-4123 7066
E-mail:	mahesh.chandran@wirtgenindia.com
Mobile:	+91 98672-06114

Kind Attn: Mr. B. Mahesh Chandran (Manager – Sales)

Dear Sir,

Sub: Supply of Soil Vibratory Compactor Model HAMM 311 – 12 nos. for our **ETAWAH (U.P.)** Site.

With reference to your Proforma Invoice no. Sales/PI/AMM-311/2013 dated 08 June 2013, the subsequent e-mails and negotiations with you, we are pleased to confirm this order on you for supply of Roller Vibratory (Soil Compactor) Model HAMM 311 – 12 nos. for our Etawah (U.P.) Project Site, as per the description / specifications and terms and conditions as detailed below:

1.	SI.No	DESCRIPTION / SPECIFICATIONS	QTY	RATE [Rs]	AMOUNT [Rs.]
	01.	Roller Vibratory (Soil Compactor) Model HAMM 311 Detailed scope of supply and technical features as per annexure 1 and other features as mentioned in your leaflet enclosed with the Proforma Invoice.	12 Nos.	18,75,000.00	2,25,00,000.00
		Add: E.Duty & Education Cess 12.36%		2,31,750.00	27,81,000.00
		Total Before C.S.T.		21,06,750.00	2,52,81,000.00
		Add: C.S.T. against Form "C" @2%		42,135.00	5,05,620.00
		Total Order Price (F.O.R. Site)	12	21,48,885.00	2,57,86,620.00

Total Order Price: Rupees Two Crore Fifty Seven Lacs Eighty Six Thousand Six Hundred Twenty only.

PO/CAP/SOIL COMPACTOR/ETAWAH (224213)/WIRTGEN/ 008 dated 18.06.13

2.	PRICES : F.O.R. Etawah (U.P.) Site.	
A)	The above price is inclusive of :	
	a.	Excise Duty @ 12 % & Education Cess on E.D. @ 3 %
	b.	C.S.T. @2 % against Form "C", which shall be provided by us at the completion of the current quarter.
	c.	Loading at your works at Pune.
	d.	Road freight from your works at Pune to our Site at Etawah in U.P. or other locations which shall be intimated before the delivery
	e.	Transit Insurance upto our Site at Etawah (U.P.).
B)	The above price is exclusive of :	
	a.	Unloading at our Etawah (U.P.) Site.
	b.	Octroi, Entry Tax as applicable.
C)	Credit Note :	
	a.	You shall provide credit note of Rs.1,75,000/- for each machine within 30 days from the date of Invoice.

3.	FIRM PRICE :
3.01	The prices shall remain firm for the quantity ordered till March,2014
3.02	Changes if any, in the rates of Govt. Taxes & levies will be to our account.

4.	DELIVERY :
	As mutually agreed you shall deliver the 04 nos. machines immediately within 2 days from the date of delivery order from financier.
	Balance 8 nos. machines shall be delivered as per schedule of requirement of Site. However, as mutually agreed the last date of delivery shall be on or before 31 March 2014.

5.	PAYMENT :
	As mutually agreed we shall release the payment against this order as under.
	<p>a) For immediate delivery 4 nos. machines 10% advance on acceptance of this order and balance 90% against delivery thru confirmed delivery order from approved Financier with 180 days credit.</p> <p>b) Payment of balance 04+04 nos. machines shall be released at the time of scheduled delivery thru financier against Proforma Invoice.</p>

6.	INSPECTION :
	We reserve our right to inspect the Compactor at your works prior to dispatch. However, you shall carry out in-house inspection and furnish a copy of the same with the supply.



PO/CAP/SOIL COMPACTOR/ETAWAH (224213)/WIRTGEN/ 008 dated 18.06.13

7.	ERECTION / INSTALLATION & COMMISSIONING You shall provide us with 02 sets of Operators Manual along with each machine. You shall provide FREE Commissioning at our Project Site in Etawah and other sites as and when the deliveries happen. Your Commissioning Engineer shall impart training to our personnel during commissioning.
8.	WARRANTY: You shall give warranty that the equipment to be supplied by you will be free from functional defects in material and/or workmanship, for a period of 36 months from the date of commissioning or 3000 working hours, whichever is earlier. This warranty will not apply to failures occurring as a result of abuse, misuse, negligent repairs, corrosion, erosion and normal wear and tear, alterations or modifications made to the product without express written consent from you or failure to follow the recommended operating practices and maintenance procedure as provided in the Product's Operating and maintenance Manuals. Accessories and equipment supplied by WIRTGEN but manufactured by others namely, tyres, batteries, belts, electrical equipment, hydraulic transmissions, carriers, gear boxes, electric motors, electrical items, hydraulic pumps, hydraulic valves etc. shall carry warranty as per the respective manufacturer's terms with WIRTGEN which you shall pass on to us. You shall arrange for repairs / replacement of any components / parts which, up on inspection are found to be defective, and shall arrange for such inspection / repairs / replacement within 12 hours from the time of intimation to you, so that the down time of the machines is restricted to 12 hours.
9.	AFTER SALES SERVICE : You shall ensure that your trained Representative / service engineer is exclusively posted at our Sites where minimum 04 machines shall be in use to attend break down or unsatisfactory performance of the machine. You shall also ensure that the spare parts / components are made available and replaced from your nearest warehouse / dealer within 12 hours from the time of demand / intimation, in order to minimize the down time of the machine – during warranty period as well as afterwards. As mutually agreed, the spares consumption for the preventive/periodic maintenance should not exceed beyond Rs. 75,000(as per the attached sheet) for upto 2000 working Hrs. However Wirtgen India will not be accountable to supply spares free of charge in following cases : Usage of machine for other applications which are not defined for Soil compactors. Operation of machine by unskilled operators. Physical damages, accident, natural calamity or other events of similar nature.

PO/CAP/SOIL COMPACTOR/ETAWAH (224213)/WIRTGEN/ 008 dated 18.06.13

	Usage of right quality of fuel, lubricants etc. Usage of parts other than recommended by Wirtgen Service Engineers. Delay in preventive maintenance. (Preventive maint to be done by Wirtgen). The fuel consumption of each machine shall be jointly checked at Site. Any increase in fuel consumption above 10 ltrs/hr under any condition shall be immediately brought to your notice and shall be mutually discussed and resolved as deemed fit along with your Managing Director
--	---

10.	OUR SALES TAX REGISTRATION NUMBERS in UTTAR PRADESH
	TIN NO. 09865712830

11.	DELIVERY ADDRESS / INSTRUCTIONS :
	Valecha Engineering Limited C/o. Smt. Ram Murthi Devi, Vinod Nagar, ITI, On State Highway 83, Etawah – 206002, UTTAR PRADESH. Contact Person - Mr. Manoj Pandey (+918392916601) OR ALTERNATE ADDRESS SHALL BE COMMUNICATED.

12.	OTHER TERMS :
	We will prepare a separate Buyback Agreement for initial 8 machines supply till December 2013. The buyback agreement duly signed by your Managing Director, presently Mr. Ramesh Palagiri shall be co-related with this purchase order. For balance 4 nos. machines we shall discuss and decide in December 2013.

13.	JURISDICTION :
	This contract shall be subject to the jurisdiction of Mumbai High Court.

Please sign (with date and stamp) the duplicate copy of this order in token of your acceptance of the same and return it to us under your covering letter.

Thanking you,
Yours truly,

For Valecha Engineering Limited

All terms and conditions
Accepted by
For WIRTGEN INDIA PVT. LTD.

End: Annexure 1 – Scope of supply and Technical Features.



PO/CAP/SOIL COMPACTOR/ETAWAH (224213)/WIRTGEN/ 008 dated 18.06.13

**ANNEXURE 1 TO THE PURCHASE ORDER OF
ROLLER VIBRATORY SOIL COMPACTOR MODEL HAMM 311
SCOPE OF SUPPLY AND TECHNICAL FEATURES**

01	ROLLER VIBRATORY SOIL COMPACTOR MODEL HAMM 311 (12 NOS.)																																																				
	<p>• <u>Technical Specifications :</u></p> <p>Weights :</p> <table> <tr> <td>Operating Weight</td> <td>11100 kgs</td> </tr> <tr> <td>Drum module Weight</td> <td>6800 kgs</td> </tr> <tr> <td>Rear module weight</td> <td>4300 kgs</td> </tr> <tr> <td>Static Linear Load</td> <td>31.8 kg /cm</td> </tr> </table> <p>Drive :</p> <table> <tr> <td>Speed</td> <td>0 – 10 km / hour</td> </tr> <tr> <td>Steering Articulation</td> <td>±40 deg</td> </tr> <tr> <td>Oscillation</td> <td>±10 deg</td> </tr> <tr> <td>Tyre size</td> <td>23.1x26-8PR</td> </tr> <tr> <td>Gradeability</td> <td>34%</td> </tr> </table> <p>Vibration :</p> <table> <tr> <td>Mode of operation</td> <td>Electronic</td> </tr> <tr> <td>Nominal amplitude, high/low</td> <td>1,78/0,75 mm</td> </tr> <tr> <td>Vibration frequency,</td> <td>32/40 hz</td> </tr> <tr> <td>Centrifugal force, high/low</td> <td>240/158 KN</td> </tr> <tr> <td>Total Applied force high/low</td> <td>308/226 KN</td> </tr> </table> <p>Engine :</p> <table> <tr> <td>Make :</td> <td>Cummins</td> </tr> <tr> <td>Type</td> <td>4BTAA3.9, BSIII</td> </tr> <tr> <td>Cooling</td> <td>Liquid</td> </tr> <tr> <td>Rated Output @ RPM</td> <td>99 hp (74 kw) @ 2200 rpm</td> </tr> <tr> <td>Electrical system</td> <td>12 V @ 150 AH</td> </tr> </table> <p>Overall Dimensions :</p> <table> <tr> <td>Length Overall</td> <td>5695 mm</td> </tr> <tr> <td>Width Overall</td> <td>2250 mm</td> </tr> <tr> <td>Drum Diameter</td> <td>1504 mm</td> </tr> <tr> <td>Drum Width</td> <td>2140 mm</td> </tr> <tr> <td>Drum shell thickness</td> <td>25 mm</td> </tr> <tr> <td>Inside turning radius</td> <td>4005 mm</td> </tr> <tr> <td>Wheel base</td> <td>3005 mm</td> </tr> </table>	Operating Weight	11100 kgs	Drum module Weight	6800 kgs	Rear module weight	4300 kgs	Static Linear Load	31.8 kg /cm	Speed	0 – 10 km / hour	Steering Articulation	±40 deg	Oscillation	±10 deg	Tyre size	23.1x26-8PR	Gradeability	34%	Mode of operation	Electronic	Nominal amplitude, high/low	1,78/0,75 mm	Vibration frequency,	32/40 hz	Centrifugal force, high/low	240/158 KN	Total Applied force high/low	308/226 KN	Make :	Cummins	Type	4BTAA3.9, BSIII	Cooling	Liquid	Rated Output @ RPM	99 hp (74 kw) @ 2200 rpm	Electrical system	12 V @ 150 AH	Length Overall	5695 mm	Width Overall	2250 mm	Drum Diameter	1504 mm	Drum Width	2140 mm	Drum shell thickness	25 mm	Inside turning radius	4005 mm	Wheel base	3005 mm
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Wheel base	3005 mm																																																				



15

Item of equipment: WATER TANKER – 5 NOS		
Equipment information	Name of manufacturer TATA	Model and power rating -
	Capacity 10 KL	Year of manufacture 2006
Current status	Current location Haryana, Pune, Mizoram	
	Details of current commitments Haryana Sonepat Road, Pune Roads, Mizoram State Highway 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	

16.

Item of equipment: WMM mixing plant - 3(Three) No		
Equipment information	Name of manufacturer Shivshakti	Model and power rating WM -100
	Capacity 100 TPH	Year of manufacture 2001
Current status	Current location Kota, Rajsthan	
	Details of current commitments Kota Bridge Work	
Source	Indicate source of the equipment <input checked="" type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	



I. O 9001 : 2008 Certified Company

RETAIL / TAX INVOICE

E-mail: info@kaushikengineeringworks.com
 Ph.: +91-79-22901989, 22902714
 Fax : +91-79-22902815

Trading Invoice



KAUSHIK
ENGINEERING WORKS

Plot 520, Road No.14, Kathwada G.I.D.C., Odhav Road, Ahmedabad - 382 430, INDIA.

Name & Address of Consignee

M/s. Valecha Engineering Ltd.
 C/o.Smt. Ram Murthi Devi,
 Vinod Nagar, ITI, on State Highway 83,
 Etawah (KM 42), Uttar Pradesh
 P.O. NO. PO/CAP/224313-Etawah-MainPuri
 Mr. Viplav Choudhary - 097194-09799

Comm. Invoice No.: **02**
 Date : 21/05/2013
 Del. Challan No. : 34/2013/2014
 Date : 21/05/2013
 Order No. :
 Date :

Consignee's TIN / C. S. T. No.: 09865712830

No.	Description & Specification of goods	Quantity	Rate	Amount in ₹
4	Wet Mix Macadam Plant KEW-100 with Accessories	01 No	4,95,000.00	4,95,000.00
2	100 TPH Pugmill	01 No	10,000.00	10,000.00
3	Printer Epson (LX 300)	01 Coil	1,275.00	1,275.00
4	0.50 Sq mm 3 Core Flexible Wire	02 Coil	2,900.00	5,800.00
5	1.50 Sq mm 3 Core Flexible Wire	30 Mtr	120.00	3,600.00
6	6.00 Sq mm 3 Core Flexible Wire	25 Mtr	49.00	1,225.00
6	2.5 Sq mm 3 Core Flexible Wire			

Received
24/5/13

Material Received
Valecha Engg. Ltd.
 Etawah To Mainpuri Road Project
 Gr. No. *214*.....Date: *25.5.2013*
 Time.....Sign.....*[Signature]*

Manner of Transport		TOTAL	
If by Motor Vehicle, its Registration No.	HR-38-N-3522	Add. VAT / C.S.T	5 % 5,16,900.00
If by Rail, Air, T.R. / T.P.R. / A.W. Bill No.	010-2151	Add. Addi. V.A:T	5 % 25,845.00
Etawah To Mainpuri Road Project		GRAND TOTAL	5,42,745.00

Total Amount (in Words)
 Name of the Party **Kaushik** Rupees Five Lakhs Forty Two Thousand Seven Hundred Forty Five Only



Terms & Condition
 No order will be taken back
 responsibility ceases after the goods leave our premises.
 18% amount will be charged on bill within 15 days

Material Received
Valecha Engg. Ltd. For, KAUSHIK ENGINEERING WORKS
 Etawah To Mainpuri Road Project
 Gr. No. *214*.....Date: *25.5.13*
 Time.....Sign.....*[Signature]*

[Signature]
 Authorised Signatory
 Chief Engineer,
 World Bank Projects, Odisha
 Chief Engineer,
 World Bank Project
 On the E.I.C.(Civil), Odisha
 Bhubaneswar

VALECHA ENGINEERING LIMITED
 Store Receipt Site Incharge Director
542745200
28.5.13
[Signature]

ISO 9001 : 2008 Certified Company

Invoice under Rule-11 of the Central Excise Rules, 2007
Removal of Excisable goods from a factory

Duplicate For Transporter

E-mail: info@kaushikengineeringworks.com
Ph.: (91) 79-22901989, 22902714
Fax : 91-79-22902815

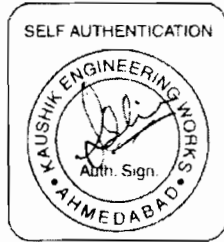
RETAIL / TAX-INVOICE
Under Rule-42 (3&4) of Gujarat Value Added
Tax Rules 2006

Plot 520, Road No.14, Kathwada G.I.D.C., Odhav Road, Ahmedabad - 382 430, INDIA.



Name & Address of Consignee

M/s. Valecha Engineering Ltd.
C/o Smt. Ram Murthi Devi,
Vinod Nagar, ITI, on State Highway 83,
Etawah (KM 42), Uttar Pradesh
P.O. NO. PO/CAP/224313-Etawah-MainPuri
Mr. Viplov Choudhary - 097194-09799
TIN NO. 09865712830
Description of Excisable commodity : Construction Machinery
Tariff Heading / Sub-Heading No. : 8474.32.00



Invoice Serial No. : **33**
Date of Issue : 21/05/2013
Time of Issue : 12:00 HRS
Date of Removal of Goods : 21/05/2013
Time of Removal of Goods : 12:30HRS
Delivery Challan No. : 33/2013/2014
Date :

Sr. No.	Description & Specification of goods With H.S.N. Code	Total Quantity	Assessable Value Per unit Rs.	Amount in Rupees
1	Wet Mix Macadam Plant KEW-100 with Accessories Electrical Control Panel with Control Cabin	01 Set	2,40,000.00	2,40,000.00
<p>Received Date: 21/5/13 Gr. No. 33 Etawah To Mainpuri Road Project Valecha Engg. Ltd. Material Received</p>		<p>Total Assessable Value 2,40,000.00 Add. Excise Duty 12 % 28,800.00 Add. Edd Cess 2 % 576.00 Add. S&H Edu. Cess, % 288.00 TOTAL 2,69,664.00 Add. VAT / C.S.T 5 % 13,483.00 Add. Addi. V.A.T % 0.00 GRAND TOTAL 2,83,147.00</p>		
<p>Consignee's C.S.T. No. 09865712830 Document Through Direct Goods Despatched from Ahmedabad to Etawah, U.P. Manner of Transport By Road If by Motor Vehicle, Its Registration No. HR-38-N-3512 If by Rail / Air T.R. / L.R. / R.R. / A.W. Bill No. 010-2150 Bill Passed: Valecha Engg. Ltd.</p>		<p>Total Amount (in Words) Etawah To Mainpuri Road Project Rupees Two Lakhs Eighty Three Thousand One Hundred Forty Seven Only</p>		

Total Excise Duty Payable Rs. 29,664.00
Vide Debit Entry No. In P.L.A.
Range : V, Division III.
Full Postal Add. :
Sahjanand Arcade, Nr. Helmat Circle, Ahmedabad.

Name of the Party Kaushik Engineering Works
(In Words) Rupees Twenty Nine Thousand Six Hundred Sixty Four Only
Date
Date
Date

Bill No. 33 Date 21-5-13
Gr. No. 33 Date 21-5-13
City Checked by On 21/5/13

Verified For KAUSHIK ENGINEERING WORKS
Amount Pass Rs. 283147.00
Date 21-5-13

Subject to Ahmedabad Jurisdiction
Volume I Page 72 of 100
Chief Engineer, Authorised Bank Projects, Odisha Employee

VALECHA ENGINEERING WORKS LTD. Contractor
Stamp: VALECHA ENGINEERING WORKS LTD. Ahmedabad

ISO 9001 : 2008 Certified Company

Invoice under Rule-11 of the Central Excise Rules, 2007
Removal of Excisable goods from a factory

Duplicate For Transporter

E-mail: info@kaushikengineeringworks.com
Ph.: (91) 79-22901989, 22902714
Fax : 91-79-22902815

RETAIL / TAX-INVOICE

Under Rule-42 (3&4) of Gujarat Value Added Tax Rules 2006



KAUSHIK
ENGINEERING WORKS

Plot 520, Road No.14, Kathwada G.I.D.C., Odhav Road, Ahmedabad - 382 430, INDIA.

Name & Address of Consignee

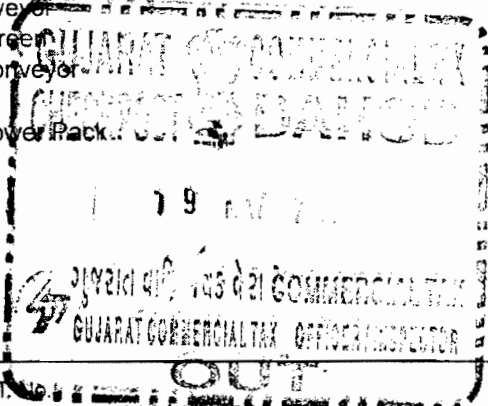
M/s. Valecha Engineering Ltd.
C/o.Smt. Ram Murthi Devi,
Vinod Nagar, ITI, on State Highway 83,
Etawah (KM 42), Uttar Pradesh
P.O. NO. PO/CAP/224313-Etawah-MainPuri
Mr. Viplav Choudhary - 097194-09799
TIN NO. 09865712830



Invoice Serial No. : **30**
Date of Issue : 18/05/2013
Time of Issue : 17:00 HRS
Date of Removal of Goods : 18/05/2013
Time of Removal of Goods : 17:30HRS
Delivery Challan No. : 30/2013/2014
Date :

Description of Excisable commodity : Construction Machinery
Tariff Heading / Sub-Heading No. : 8474.32.00

Sr. No.	Description & Specification of goods With H.S.N. Code	Total Quantity	Assessable Value Per unit Rs.	Amount in Rupees
1	Wet Mix Macadam Plant KEW-100 with Accessories Four Bin Feeder Gathering Conveyor Slinger Conveyor Vibrating Screen Load Out Conveyor Gob Hopper Hydraulic Power Pack	01 Unit	8,00,000.00	8,00,000.00
Consignee's C.S.T. No. 09865712830 Document Through Direct Goods Despatched from Ahmedabad to Etawah, U.P. Manner of Transport By Road If by Motor Vehicle. Its Registration No. HR-38-L-0415 If by Rail / Air T.R. / L.R. / R.R. / A.W. Bill No. 010-2		Total Assessable Value Add. Excise Duty 12 % 96,000.00 Add. Edd. Cess 2 % 1,920.00 Add. S&H Edu. Cess % 960.00 TOTAL Add. VAT / C.S.T 5 % 8,98,880.00 Add. Addi. VAT % 44,944.00 GRAND TOTAL 9,43,824.00		8,00,000.00
Total Amount (in Words) Rupees Nine Lakhs Forty Three Thousand Eight Hundred Twenty Four Only		Name of the Party: <u>Kaushik</u>		



Bill Passed
Valecha Engg. Ltd.
Etawah To Mainpuri Road Project

Material Received

Total Excise Duty Payable Rs. 88,880.00 (In Words) Rupees Ninety Eight Thousand Eight Hundred Eighty Only

Vide Debit Entry No. 171 Date 21.5.13

Range : V, Division Etawah To Mainpuri Road Project

Full Postal Address Sahjanand Arcade, Nr. Helmat Circle, Ahmedabad.

Gr. No. 171 Date 21.5.13

Time 11:30 AM Sign [Signature]

C.Ex. Reg. No. : AAAP/224313 EXM 0011

G.S.T. Tin No. 2431313000721 16-9-2005

C.S.T. Tin No. 09865712830 16-9-2005

Checked by: [Signature] Contractor

For: **KAUSHIK ENGINEERING WORKS**

Amount Pass Rs. 9,43,824.00

Date 21.5.13

Authorized Signatory [Signature] Chief Engineer, Works Bank Projects, Odisha

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18.

Item of equipment: CONCRETE PUMPS		
Equipment information	Name of manufacturer Schwing Stetter	Model and power rating BP 350D
	Capacity 25 Cum/Hr.	Year of manufacture 2009
Current status	Current location Delhi	
	Details of current commitments Anand Vihar	
Source	Indicate source of the equipment <input checked="" type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	

19.

Item of equipment: CONCRETE FIXED FORM PAVER		
Equipment information	Name of manufacturer Multiquip	Model and power rating Wrs 1400lp
	Capacity 100 TPH	Year of manufacture 2008
Current status	Current location Kota, Rajsthan	
	Details of current commitments Kota Bridge Work	
Source	Indicate source of the equipment <input checked="" type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	



VALECHA ENGINEERING LIMITED
Contractor




Chief Engineer,
World Bank Projects, Odisha
Employer
Rajnagar, Bhubaneswar

**PERSONNEL REQUIREMENT AS PER REQUIREMENT
OF BIDDING DOCUMENT**

The Bidder shall demonstrate that it has the personnel for the key positions that meet the following requirements:

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	3	1	Graduate with skill and experience in handling the Health, Environment, Safety issues



Form PER – 1: PROPOSED PERSONNEL

1.	Title of position* PROJECT MANAGER	Name – Mr. Rajeev Agrawal
2.	Title of position* HIGHWAY ENGINEER	Name –Mr. Shivmurty L.
3.	Title of position* BRIDGE ENGINEER	Name-Mr. J.N. Chandrashekhar
4.	Title of position* MATERIAL ENGINEER	Name-Mr. Sunli Shinde
5.	Title of position* QUANTITY SURVEYOR	Name-Mr. Mahavir Sangave
6.	Title of position* EQUIPMENT MAINTENANCE ENGINEER	Name-Mr. P.L. Kamble
7.	Title of position* ENVIRONMENT AND SAFETY MANAGER	Name-Mr.Rajech Kumar



Resume of Proposed Personnel-1

Position-PROJECT MANAGER		
Personnel information	Name- Mr. Rajeev Agrawal	Date of birth-07.06.1966
	Professional qualifications- B.E. Civil Engineering	
Present employment	Name of employer- Valecha Engineering Limited	
	Address of employer – Valecha Cahmbers, 4 th Floor, Plot No B-06, Andheri New Link Road, Mumbai-400053	
	Telephone: 022- 42633200	Contact (manager / personnel officer) HR Department
	Fax No: 022- 26733945	E-mail:-ho@valecha.in
	Job title:- Project Manager	Years with present employer: From 2006 to till date

Summariss professional experience over the last 20 years, in reverse chronological order.

From	To	Company / Project / Position / Relevant technical and management experience
16.11.2006	Till Date	M/s Valecha Engineering Ltd. – AGM (Projects)MCGM roads.
April 2005	Nov' 2006	M/s Unity Infraprojects Limited-Project Manager-MCGM Roads within Mumbai
Jn 04	March 2005	M/s Cemacon Consultants, Vashi, Navi Mumbai-Sr Residential Engineer-MMRDA Various road projects within Mumbai.
Dec 1993	Dec 2003	<ol style="list-style-type: none"> 1. Jus Electronics(April 2003 Dec 2003)-Dy. Project Manager:- An Industrial building for the production of electronics produts, having G+3 stories with stilts, involving construction of industrial cum residential building, site development, boundary wall, plumbing & sanitation and flooring of the building at Electronic Zone, Mhape, Navi Mumbai. 2. Worked as a Sr. Engineer Borivli Flyover. 3. Cray valley Resin India Limited (April 99-Dec 2002)-Dy. Proeject Manager civil works for entire factory invloving administrative buildings, resin plant, utility bldg., R&D centre, solvent tank yard, underground water tank with pump house, Drum storage yard, ETP, Boundary wall, roads, and drainage at Shiravane, Navi Mumbai. 4. Mazda Dye-Chem Ltd/ Mazda Colours Ltd (May 1996-Dec 2003) Dy. Project Manager – Civil works involving construction of ETP, Engineering store, canteen crude plant, extension of crude plant, undergorund water tank Beta blue plant, Emulsion Plant, Transformer Yard & Boundary wall at Turbhe, Navi Mumbai.



From	To	Company / Project / Position / Relevant technical and management experience
Dec 1993	Dec 2003	<p>5. Indian Petrochemical Corporation Ltd 1997-Dy. Project Manager- All civil & structural works involving dehydrogenate catalyst plant, PSA unit, effluent drainage work for the catad division at Rabale, Navi Mumbai.</p> <p>6. Air Freight Logistic Limited-Dy. project Manager</p> <p>a) Trimix Floor at Turbhe (1996) Consultants: Prabhuraj & Associates</p> <p>b) Trimix Floor, Taloja warehouse(2000) Consultant: Prabhuraj & Associates Description : Trimix Concrete floor with construction chemicals & floor hardeners</p> <p>7. Lubrizol India Limited (April 1994) to Dec 2003) Dy. Project Manager construction of civil & structural works pertaining to their nitrogen plant, administrative building, car park, effluent treatment plant, bulk storage facility, scrap yard, QA Lab R&D centre, Fabrication Yard, tank farm, roads & drainage etc.</p> <p>8. Indo Borex Limited (Dec 1993 to March 1994) Sy. Project Manager Description Civil, Mechanical & Structure work of entire chemical industry at pithampur (MP) having plan, utility, boiler house, administrative buildings, O.H. water tank, boundary wall, roads, drainage etc.</p>
March 92	Dec 1993	<p>Madhumilan Syntax Ltd., Indore Civil Engineer at Soya Bean Division at Dewas.</p> <p>Civil & structural works involving land development, survey and construction of residential multistoried buildings, industrial shed, boiler house, refinery, laboratory, canteen, administrative building, ETP, roads & drainage system for the company's soya bean extraction plant at Dewas.</p>
Dec' 88	Feb 92	<p>Indian Prestressed Corporation Pvt. Ltd., Mumbai –Civil Engineer (Site Incharge) in Western Railway.</p> <p>Description :-1 Construction of Pre-stressed road over bridge with approaches for western Railway at Dara, District Kota, Raj (June 1988-1989)</p> <p>Construction of pre-stressed fly over bridge with approaches for western Railway at Ratlam, MP (1989-1992)</p>
Aug' 87	May' 88	<p>Consultancy Concern Engineering Supervisor - Civil works involving construction of residential buildings having pile foundations, road & bridges drainage etc.</p>



Resume of Proposed Personnel-2

Position- HIGHWAY ENGINEER		
Personnel information	Name – Mr. Shivmurty L.	Date of Birth-03.06.1967
	Professional qualifications:- B.E. Civil Engineering	
Present employment	Name of employer- M/S Valecha Engineering Limited	
	Address of employer- Valecha Cahmbers, 4 th Floor, Plot No B-06, Andheri New Link Road, Mumbai-400053	
	Telephone: 022- 42633200	Contact (manager / personnel officer) HR Department
	Fax No: 022- 26733945	E-mail:-ho@valecha.in
	Job title:- Site Engineer	Years with present employer: From 2008 to till date

From	To	Company / Project / Position / Relevant technical and management experience
Apr-2009	Nov 2009	Name of the Project- D-wall & Piling works for Underground Parking at High Court, Contractor-Valecha Engineering Limited., Working as Senior Engineer DMRC.
Dec 2008	Apr 2009	Name of the Project: Anand Vihar Grade Separator & Fly Over Project Valecha Engineering Limited Working as Site Engineer Public works Department (PWD)
Jan 08	Dec 08	Construction of D-wall for Metro Train Station at New Delhi station & Shivaji Stadium Station Valecha Engineering Limited working as site Engineer.
Jan 06	Dec 07	Rehabilitation & up gradation of Chitradurga-Davangere section of Package 3 (km 189.000 to 250.000) Supreme-MBL(JV) working as Site Engineer, NHAI
Jan 04	Dec 05	Executed office & Residential Buildngs & Road Works KSR Groups workings as site Engineer PWD (Karnataka)
Apr 01	Dec 03	Construction of Vikas Soudha at Bangalore B.G. Sherke Construction Ltd PWD (Karnataka)



Resume of Proposed Personnel-3

Position- : BRIDGE ENGINEER	
Personnel information	Name- MR. J. N. Chandrashekhar Date of birth-24.03.1966
	Professional qualifications- : B.E. Civil Engineering
Present employment	Name of employer- M/S Valecha Engineering Limited
	Address of employer- Valecha Cahmbers, 4th Floor, Plot No B-06, Andheri New Link Road, Mumbai-400053
	Telephone: 022- 42633200 Contact (manager / personnel officer) HR Department
	Fax No: 022- 26733945 E-mail:-ho@valecha.in
	Job title:- General Manager Years with present employer: From 2011 to till date

From	To	Company / Project / Position / Relevant technical and management experience
1990	1991	Sri Dasaratharma Reddy Co./ Execution of Residential Building of all category i.e. LIG, MIG Development Authority under HUDCO/Site Engineer.
1991	1994	Afcons/Survey 1200 daimeter cast insitue pile, pile caps, piers, pier caps. Bearing pedestals, hand Rails, expansion joints /Junior Engineer
1994	1996	Afcons / Survey Controlling of stone dumping for the construction of breakwaters / Junior Engineer.
1996	1997	Afcons/Cast-in-Situ piles, precast, beams and in-situ concerting/Site Engineer.
1997	1998	Afcons/On Shore Intake struture, discharge structure, precast units/ Site Engineer.
1998	2000	Afcons/ Cast-in-situ piles of 1000 dia, 1200 dia and 1500 dia precast beams casting and erection, In-situ slabs, mooring dophins, service plantform/ Senior Engineer.
2000	2003	Afcons/1500 Diamater insitu piles, well foundation, pile cap, cast insitu box Girders/ Resident Engineer.
2003	2011	Afcons/Planning & Execution of Diaphragm wall and all civil works related the construction of Delhi Metro Rail Corporation U/G Station/Manager.
2011	Till Date	Valecha Engineering Ltd/ In-charge of Prem Bari Pul Underpass at New Delhi DTTC Proeject/In-charge of Mangolpuri Grade separator at New Delhi PWD Delhi Project.



Resume of Proposed Personnel-4

Position- : MATERIAL ENGINEER	
Personnel information	Name – Mr.Sunil Shinde Date of Birth:- 04.02.1970
	Professional qualifications- B.E. Civil Engineering
Present employment	Name of employer- M/S Valecha Engineering Limited.
	Address of employer- Valecha Cahmbers, 4th Floor, Plot No B-06, Andheri New Link Road, Mumbai-400053
	Telephone: 022- 42633200 Contact (manager / personnel officer) HR Department
	Fax No: 022- 26733945 E-mail:-ho@valecha.in
	Job title:- Material Manager Years with present employer: From 2006 to till date

From	To	Company / Project / Position / Relevant technical and management experience
	Over 10 years	<i>Valecha Engineering Limited Proeject Engineer Roads and Bridges</i>
2003	2004	<p>a) Sr. Engineer:- Proeject Construction of cross drain work Vita Peth. Malkarpur Road winding WBM Carpet sillcoat.</p> <p>Job Profile:- Supervision & Executing the following ativity independently Finalising alignment profile cross drain junction signs boards safety measures. Taking Final pit for finalising strata work as per drawing provided by PWD & EE Construction abutment walls casting mass concretee checking of work as per tender making RA Bills road winding W.B.M. bituminous carpet, sillcoat will done as per JE & EE.</p>
2002-	2003	<p>b) Executive Engineer, PWD (Miraj) : - Supervision & Execution.</p> <p>Proeject:a) Construction of WBM road in Kupwad (Miraj) b) Construction of WBM road in Mhaisal(Miraj)</p> <p>Job Profile:- Supervision & Executing follwing activity independently. Finalising alignment , levelling, preparing 60mm aggregate 40mm aggregate rolling measuring qty of materail R.A. bill checking of work as per drawing & cross section provided by division under JE & EE</p>
		<p>c) Panchaya Samati Tasgaon(Sangli)</p> <p>Job Profile:- Taking trial pit for the foundation deciding pile or footing and working as per trial pit casting GI beam, columns, steel structure which will design as per IS code 1999 and location.</p>
1999	2002	<p>d) Executive Engineer PWD Division (Miraj)</p> <p>Project Construction of the shed.</p> <p>Job Profile Yaking trial pit for the foundation for pile or footing and working as per trial pit Mass Concrete, casting GI beams columns, steel structure which will design as per IS Code 1999 and location</p>



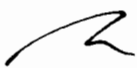
From	To	Company / Project / Position / Relevant technical and management experience
1997-	1999	<p>e) Executive Engineer PWD Division (Miraj) Supervision & Execution Project Construction of multipurpose Gymnasium hall at Bhanu Talim, Miraj Dist-Sangli.</p> <p>Job profile:- Supervision & Executing following activity independently. Taking trial pit design footing isolated with RCC, PCC Casting checking with drawing consulting JE & Dy. Engineer casting RC Beams column 10mtr ht steel struts as per span(20mtr) with GI sheets and flooring with wooden court.</p>
1997	2003	<p>f) Self</p> <p>Job Profile Construction of row houses, residential buildings such Mhaisal, Miraj Sangli Ashta Islampur, Tasgaon.</p>
1996-	1997	<p>g) M/s A.V. Associates, Sangli Jr. Engineer</p> <p>Job Profile:- Responsible for supervision of buildings (Residential Commercial) planning preparing working drawing RCC designs estimating & preparing bills</p>
		<p>h) M/s Parekh Associates, Sangli site Engineer</p> <p>Job Profile Responsible for supervision of building (Residential, Commercial) planning preparing working drawing RCC designs estimating & preparing bills.</p>



Resume of Proposed Personnel-5

Position- : QUANTITY SURVEYOR	
Personnel information	Name – Mr.Mahavir Sangave Date of Birth:- 01.06.1967
	Professional qualifications - Diploma in Civil Engineering,
Present employment	Name of employer- M/S Valecha Engineering Limited.
	Address of employer- Valecha Cahmbers, 4th Floor, Plot No B-06, Andheri New Link Road, Mumbai-400053
	Telephone: 022- 42633200 Contact (manager / personnel officer) HR Department
	Fax No: 022- 26733945 E-mail:-ho@valecha.in
	Job title:- Quantity Surveyor Years with present employer: From 2001 to till date

From	To	Company / Project / Position / Relevant technical and management experience
May 89	Oct 90	M/s Mehta Associates, Sangli/Civil Works/Civil Engineer/ Structural Works
Oct-90	May 94	M/s Pheroze Kudinaaala Consultant Engineers, Mumbai/Civil Engineer/ Building works
May 94	Feb 01	M/s Kavi Engineers & Consultants, 901, Tapasya Bldg, D'sliva wadi, Prabhadevi Mumbai-25/Civil Engineer/Roads and Bridge works
Fe01	Till Date	M/s Valecha Engineering Ltd., Mumbai/Civil Engineer, Flyover at National Park Junction Borivli, Pile foundation with hydraulic rotary rigs for flyover and buildings



VALECHA ENGINEERING LIMITED
Contractor




Chief Engineer,
World Bank Projects, Odisha
Chief Engineer - Employer
World Bank Projects
Chief Engineer (Civil), P. O.
Bhubaneswar

Resume of Proposed Personnel-6

Position- : EQUIPMENT MAINTENANCE ENGINEER	
Personnel information	Name – Mr.P. N. Kamble Date of birth:- 01.06.1969
	Professional qualifications :- B.E.(Mechanical)
Present employment	Name of employer- M/S Valecha Engineering Limited.
	Address of employer- Valecha Cahmbers, 4th Floor, Plot No B-06, Andheri New Link Road, Mumbai-400053
	Telephone: 022- 42633200 Contact (manager / personnel officer) HR Department
	Fax No: 022- 26733945 E-mail:-ho@valecha.in
	Job title:- Plant Engineer Years with present employer: From 2006 to till date

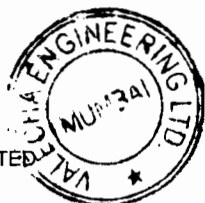
From	To	Company / Project / Position / Relevant technical and management experience
Mar 2012	Till date	Co-ordination to all 8 sites of Valecha engineering ltd. For plant & Equipment like piling Rings, cranes, Concrete plants, Boom Placers, Concrete Pumps, TM's, DG-Sets, Compressors, Automobile vehicle etc. Co-ordination to VP & Project in-charges for plant & Equipments. Mobilisation & Commissioning of Plant & Equipments for new site. To ensure preventive maintenance of plants & equipments to make man power arrangement to all site. To ensure inventory of spares, plants & Equipments.
Apr 2010	Jan 2012	Co-ordination to all 24 sites of GDCL for maintenance & repairs of plant & Machinery like concrete Batching plants, Boom placers, Concrete pumps, Transit Mixers, DG-sets, Automobile vehicle, cranes, crusehrs and other minor machineries etc. To Co-ordiante with VP & Co-ordinators of sites related to plant & Machinery. Mobilization & commissioning of plant & Machinery for New Sit4es. To ensure preventive maintenace, Down times, ISO documentations Monthly inventory of plant & Machiery, spares, Diesel. Lubircants & their costs. To cordinate for amjor sparres & new machineries to all sites. To depute/ Transfer Manpower (Engineer, Foremans Machancis. Optrs) to all sites. Transfer Idle/Major repairahble machineries to centralized workshop, get it repaired and send to requred site.
July 1994	March 2008	Maintenace and Repairs of all types of construction plants & Equipments like, Concrete Batching plants, Boom placers, Concrete Pumps, Transit Mixers,
Dec. 2008	March 2010	Earth moving equipments, pile Boaring Equipments, Automobile vehicles, Cranes, DG Sets, Crushers, Air, compressors and other minor equipments. Erection & commissioning of above all plants & Equipments. Planning & Monitoring of preventive Maintenance/Repairs of Plants Equipments. To ensure optium utilization, cost budgeting, reduce down time Root cause failure anasysts and inventory control of spres, plants & equipments various site.



Resume of Proposed Personnel-7

Position- : MATERIAL ENGINER	
Personnel information	Name – Mr.Rajesh Kumar Date of birth:- 25.12. 1972
	Professional qualifications - : B.E.(Civil), Post Graduate Diploma in Advance Construction Management from NICMAR, Master in Business Admn.(Mkt.) from IGNOU. MS Project, PRIMAVERA
Present employment	Name of employer- M/S Valecha Engineering Limited.
	Address of employer- Valecha Cahmbers, 4 th Floor, Plot No B-06, Andheri New Link Road, Mumbai-400053
	Telephone: 022- 42633200 Contact (manager / personnel officer) HR Department
	Fax No: 022- 26733945 E-mail:-ho@valecha.in
	Job title:- Civil Engineer Years with present employer: From 2006 to till date

From	To	Company / Project / Position / Relevant technical and management experience
April 2006	Till Date	M/s Valecha Engineer Ltd /Roads & Bridges/Sr. Engineer/National Highway Project.
Dec 2003	2006	M/s Hindustan Construction Company (HCC) <ul style="list-style-type: none"> Saurashtra Barnach Canal Project , Gujarat-150 Cr//QC Engineer In Central Lab. Allahabad Bypass world Bank Project (NHAI)/447 Cr. /Lab Incharge, ISO representative for the Quality Management System,ISO 9001:2004. Responsibilities:- responsible for the quality control system for all of the constriction activites in the Proeject, source approval of materails, preparation fo segment quality plant and internal test plan-ITP, and accordingly testing of the materails in the central lan as well as site labs. co-ordinationwith the site engineerrs and liasoring with the engineer, Materail Engineer for the same timely testing and submission of the test result for the final approval. JOB, MIX for the DL, GSB, WMM Filter materail etc. ISO, Representative for the Quality Management System ISO 9001:2004 Internal auditor for the intergrated management system IMS. i.e ISO 90014001 and OHSAS 18001
April 2002	April 2003	M/s Mukund Ltd.(Bajaj Group) in association with Centrodorstroy, Russia/ National Highway(B/W Allahabad & Varanasi) of NHAI-Rs. 300 Cr./Quality Control Engineer. Job Responsibilities Design of WMM, GSB, Drainage Layer etc various tests related to soil (CBR, atterberg limit etc.) Aggregates (Coarse & Fine), Bitumen, Concrete etc. Interaction with consultants.



From	To	Company / Project / Position / Relevant technical and management experience
Oct-2000	March-2002	M/s Mukund Ltd. (Bajaj Group) in association with Centrodorstroy, Russia/ National Highway-06 Amaravati - Rs. 40 Cr./Assistant Engineer. Job Responsibilities Quality Control – Soil Testing, Design of WMM, GSB etc. Overall supervision of various activities on site such as clearing and grubbing Earth works, Sub base-GSB, Drainage layer, WMM etc. (Dumping, Dozing, Grading field density test etc.), Drainage work, Fencing, Turfing, etc.) various tests related to soil (CBR, atterberg limit etc.)
May 1999	Oct.2000	Diploma in Asvance Construction Management from NICMAR, Delhi in the year of 2001 with GD-A
Dec.1995	April 1999	Bhagwati Pd.&Co.(P) Ltd., Newada, Bihar/District Roads for PWD – Rs.5 Crs / Site Engineer Job Responsibilities Quality Control – Soil testing, Design of WMM, GSB etc. Overall supervision of various activities on site such as clearing and grubbing Earth works, Sub base-GSB, Drainage layer, WMM etc. (Dumping, Dozing, Grading field density test etc)



Performance Bank Guarantee



VALECHA ENGINEERING LIMITED
Contractor



Chief Engineer,
World Bank Projects, Odisha
Employer

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

STATE BANK OF INDIA
Industrial Finance Branch
Andheri,102,Natraj Building.194
Andheri (East), MUMBAI

TEL NO:9122 26819759
FAX NO:912226831648
SWIFT NO:SBININBB197
PIN CODE:400069

THE CHIEF ENGINEER
WORLD BANK PROJECTS, ODISHA,
NIPMAN SCUDHA, KESHARI NACAR, UNIT B
BRUBANESHWAR 751001

07/09/2013

DEAR SIRs,

GUARANTEE NO :0473213BG0000677
AMOUNT OF GUARANTEE :INR7,56,53,000.00
GUARANTEE COVER FROM :07/09/2013 TO 06/09/2014
LAST DATE FOR LODGEMENT OF CLAIM :06/09/2014

THIS DEED OF GUARANTEE IS EXECUTED BY THE STATE BANK OF INDIA,
CONSTITUTED UNDER THE STATE BANK OF INDIA ACT , 1955 HAVING THE CENTRAL OFFICE
AT NARIMAN POINT , MUMBAI AND AMOUNGST OTHER PLACES. A BRANCH AT
Industrial Finance Branch HEREIN AFTER REFERRED TO AS 'THE BANK'). IN
FAVOUR OF THE CHIEF ENGINEER
(HEREIN AFTER REFERRED TO AS 'BENEFICIARY') FOR AN AMOUNT NOT EXCEEDING
INR 7,56,53,000.00
Rupees seven crore fifty six lakh fifty three thousand only

AT THE REQUEST OF VALECHA ENGINEERING LTD
AND THE GUARANTEE SHALL REMAIN IN FULL FORCE UPTO 06/09/2014
AND CANNOT BE INVOKED OTHERWISE THAN BY WRITTEN DEMAND OR CLAIM UNDER THIS
GUARANTEE SERVED ON THE BANK ON OR BEFORE THE 06/09/2014

SUBJECT TO AS AFORESAID

NOTWITHSTANDING ANYTHING CONTAINED HEREIN ABOVE, OUR LIABILITY UNDER THIS
GUARANTEE IS RESTRICTED TO
INR 7,56,53,000.00
Rupees
seven crore fifty six lakh fifty three thousand only

OUR GUARANTEE SHALL REMAIN IN FORCE UNTIL 06/09/2014. UNLESS A DEMAND OR
CLAIM UNDER THE GUARANTEE IS MADE ON OUR BANK IN WRITING ON OR BEFORE
06/09/2014 ALL YOURS RIGHTS UNDER THE SAID GUARANTEE BE FORFEITED AND WE SHALL
BE RELIEVED AND DISCHARGED FROM ALL LIABILITES THEREUNDER.

AUTHORISED SIGNATORY



AUTHORISED SIGNATORY

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

VALECHA ENGINEERING LIMITED
Contractor



Volume-I: Page 88 of 100

Chief Engineer,
World Bank Projects, Odisha
Employer

World Bank Projects, Odisha
Employer

भारतीय गैर न्यायिक

एक सौ रुपये

Rs. 100

रु. 100



सत्यमेव जयते

ONE HUNDRED RUPEES

भारत INDIA
INDIA NON JUDICIAL

श्री. गणेश कृष्णचंद्र दळवी

महाराष्ट्र MAHARASHTRA

एक सौ रुपये का बैंक ग्यारंटी का चेक
जिस पर श्री. गणेश कृष्णचंद्र दळवी
आपका खाता नंबर 5023
करीबी श्री. गणेश कृष्णचंद्र दळवी
मुंबई

HS 449580

आयुक्त मुद्रांक कार्यालय, मुंबई
प. सु. विक्रेता क्र. 993

18 JUL 2013

सक्षम अधिकारी

20 JUL 2013
20 JUL 2013

State Bank of India,
Industrial Finance Branch,
Natraj Building, 201, 1st Floor,
194, Sir M.V. Road, Andheri (East),
Mumbai - 400 069

श्री. ए. रा. मद्दो

STATE BANK OF INDIA,
INDUSTRIAL FINANCE BRANCH,
NATRAJ BUILDING, 102, 1ST FLOOR, 194, SIR M.V. ROAD,
WESTERN EXPRESS HIGHWAY, ANDHERI (EAST),
MUMBAI - 400 069.
TEL. : 26819760 / 730
FAX : 26831648

PERFORMANCE SECURITY BANK GUARANTEE

Mumbai,
Date : 7/11/2013

TO,
THE CHIEF ENGINEER
WORLD BANK PROJECTS, ODISHA
NIRMAN SOUDHA,
KESHARI NAGAR, UNIT - V,
BHUBANESHWAR - 751 001

DEAR SIRs,

GUARANTEE NO :
AMOUNT OF GUARANTEE : INR 7,56,53,000/-
GUARANTEE COVER FROM : 01.09.2012 TO 06.09.2014
LAST DATE FOR LODGEMENT OF CLAIM : 06.09.2014

0473213BG0000677

Cont...2

VALECHA ENGINEERING LIMITED
Contractor



Chief Engineer,
World Bank Projects, Odisha
Employer

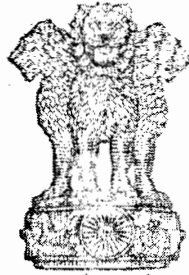
Chief Engineer,
World Bank Projects, Odisha
Employer

भारतीय गैर न्यायिक

एक सौ रुपये

Rs. 100

₹. 100



ONE HUNDRED RUPEES

सत्यमेव जयते

भारत INDIA
INDIA NON JUDICIAL

श्री. राजेश हरिहरचंद्र दळवी

महाराष्ट्र MAHARASHTRA

प्रधान मुद्रांक कार्यालय, मुंबई
प. मु. विक्रेतांक. १९३

18 JUL 2013

सक्षम अधिकारी

प्रमाणित मुद्रांक...
आमंत्रण...
महाराष्ट्र...
मुद्रांक...

HS 449581

20 JUL 2013
20 JUL 2013

State Bank of India,
Industrial Finance Branch,
Natraj Building, 201, 1st Floor,
191, Sh. M. V. Road, Andheri (East),
Mumbai - 400 069

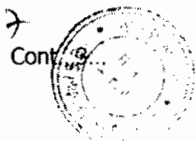
-2-

THIS DEED OF GUARANTEE IS EXECUTED BY THE STATE BANK OF INDIA, CONSTITUTED UNDER THE STATE BANK OF INDIA ACT, 1955 HAVING THE CENTRAL OFFICE AT NARIMAN POINT, MUMBAI AND AMONGST OTHER PLACES A BRANCH AT INDUSTRIAL FINANCE BRANCH, ANDHERI (E) (HEREIN AFTER REFERRED TO AS 'THE BANK') IN FAVOUR OF **THE CHIEF ENGINEER, WORLD BANK PROJECTS, ODISHA** (HEREIN AFTER REFERRED TO AS 'BENEFICIARY') FOR AN AMOUNT NOT EXCEEDING **INR 7,56,53,000/- (RUPEES SEVEN CRORES FIFTY SIX LACS FIFTY THREE THOUSAND ONLY)** AT THE REQUEST OF **VALECHA ENGINEERING LIMITED**.

THIS GUARANTEE IS ISSUED SUBJECT TO THE CONDITION THAT THE LIABILITY OF THE BANK UNDER THIS GUARANTEE IS LIMITED TO A MAXIMUM OF **Rs.7,56,53,000/- (RUPEES SEVEN CRORES FIFTY SIX LACS FIFTY THREE THOUSAND ONLY)** AND THE GUARANTEE SHALL REMAIN IN FULL FORCE UP TO **06.09.2014** AND CANNOT BE INVOKED OTHERWISE THAN BY A WRITTEN DEMAND OR CLAIM UNDER THIS GUARANTEE SERVED ON THE BANK ON OR BEFORE THE **06.09.2014**.

SUBJECT TO AS AFORESAID

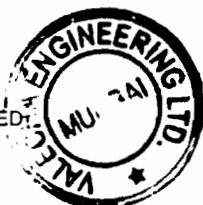
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M.C. Gaud

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VALECHA ENGINEERING LIMITED
Contractor



Chief Engineer,
World Bank Projects, Odisha
Employer

Handwritten signature

We have been informed that **M/s.Valecha Engineering Limited** having its Registered Office at 'Valecha Chambers', 4th Floor, New Link Road, Andheri (West), Mumbai – 400053 (hereinafter called "the Contractor") is awarded with Letter of Acceptance no.PMU-WB-21/2013 - 34477 dated 08.08.2013 by you, for the execution of the Civil Works ICB Package No.OSRP-CW-ICB-P04A under the proposed Odisha State Roads Project with World Bank Assistance for "Widening & Strengthening of existing carriageway to 2-lane road from Jagatpur to Duhuria (Km. 0/0 to Km. 49/0 of MDR)" (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 **State Bank of India, Industrial Finance Branch, Natraj Building, 102, 1st Floor, 194, Sir M.V.Road, Western Express Highway, Andheri (East), Mumbai – 400 069** hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of **Rs.7,56,53,000/- (Rupees Seven Crores Fifty Six Lacs Fifty Three Thousand 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 **6th day of September, 2014** 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) is hereby excluded.

The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed 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.

Notwithstanding anything contained hereinabove :

- Our liability under this Bank Guarantee shall not exceed **Rs.7,56,53,000/- (Rupees Seven Crores Fifty Six Lacs Fifty Three Thousand Only)**
- This Bank guarantee shall be valid upto **06.09.2014**; and
- We are liable to pay the guaranteed amount or any part thereof under this bank guarantee only and only if you serve upon us a written claim or demand on or before **06.09.2014**.



0473213BG000 0677 dt. 7/7/2017



तपे / कृतं भारतीय स्टेट बैंक / बैंक
For STATE BANK OF INDIA

M. K. Mehta
Authorized Signatory
Industrial Finance Branch,
102 Natraj, W.E. Highway,
Andheri (East), Mumbai-400 069.

तपे / कृतं भारतीय स्टेट बैंक / बैंक
For STATE BANK OF INDIA

M. K. Mehta
Authorized Signatory
Industrial Finance Branch,
102 Natraj, W.E. Highway,
Andheri (East), Mumbai-400 069.

[Signature]

VALECHA ENGINEERING LIMITED
Contractor



[Signature]
Chief Engineer,
World Bank Projects, Odisha
Employer

World Bank Projects, Odisha
Chief Engineer
27, Jubaneswar

STATE BANK OF INDIA
Industrial Finance Branch
Andheri,102,Natraj Building.194
Andheri (East), MUMBAI

TEL NO:9122 26819759
FAX NO:912226831648
SWIFT NO:SBININBB197
PIN CODE:400069

THE CHIEF ENGINEER
WORLD BANK PROJECTS ODISHA NIRMAN
SOUDHA KESHARI NAGAR UNIT-V
BHUBANESHWAR -751001

19/09/2013

DEAR SIRs,

GUARANTEE NO :0473213BG0000701
AMOUNT OF GUARANTEE :INR11,00,00,000.00
GUARANTEE COVER FROM :19/09/2013 TO 18/09/2014
LAST DATE FOR LODGEMENT OF CLAIM :18/09/2014

THIS DEED OF GUARANTEE IS EXECUTED BY THE STATE BANK OF INDIA,
CONSTITUTED UNDER THE STATE BANK OF INDIA ACT , 1955 HAVING THE CENTRAL OFFICE
AT NARIMAN POINT , MUMBAI AND AMOUNGST OTHER PLACES. A BRANCH AT
Industrial Finance Branch HEREIN AFTER REFERRED TO AS 'THE BANK').IN
FAVOUR OF THE CHIEF ENGINEER
(HEREIN AFTER REFERRED TO AS 'BENEFICIARY') FOR AN AMOUNT NOT EXCEEDING
INR 11,00,00,000.00
Rupees eleven crore only

AT THE REQUEST OF VALECHA ENGINEERING LTD
AND THE GUARANTEE SHALL REMAIN IN FULL FORCE UPTO 18/09/2014
AND CANNOT BE INVOKED OTHERWISE THAN BY WRITTEN DEMAND OR CLAIM UNDER THIS
GUARANTEE SERVED ON THE BANK ON OR BEFORE THE 18/09/2014

SUBJECT TO AS AFORESAID

NOTWITHSTANDING ANYTHING CONTAINED HEREIN ABOVE, OUR LIABILITY UNDER THIS
GUARANTEE IS RESTRICTED TO
INR 11,00,00,000.00
Rupees
eleven crore only

OUR GUARANTEE SHALL REMAIN IN FORCE UNTIL 18/09/2014. UNLESS A DEMAND OR
CLAIM UNDER THE GUARANTEE IS MADE ON OUR BANK IN WRITING ON OR BEFORE
18/09/2014 ALL YOURS RIGHTS UNDER THE SAID GUARANTEE BE FORFEITED AND WE SHALL
BE RELIEVED AND DISCHARGED FROM ALL LIABILITES THEREUNDER.

AUTHORISED SIGNATORY

AUTHORISED SIGNATORY

PLEASE CONTACT **नावीन चितारा** BRANCH FOR eTradeSBI FACILITY-INTERNET ACCESS TO TRADE FINANCE
NAVEEN CHITARA
C - 4872

VALECHA ENGINEERING LIMITED
Contractor



Volume-I: Page 92 of 100

Chief Engineer,
World Bank Projects, Odisha
Employer
to the E.O. (Civil), Odisha
Bhubaneswar



महाराष्ट्र MAHARASHTRA

स्थान मुद्रांक कार्यालय, मुंबई
 प. सु. विक्रेता क्र. १९३
 18 JUL 2013
 सक्षम अधिकारी

परमाणु धारक मुद्रांक विक्रेता क्र. १९३
 दिनांक २० जुल २०१३, भा.रा. शोभम जवळ,
 आणखणर चौक, नाराज बिल्डिंग (प.स. मं. १९३)
 क्रमांक ५०२०
 मध्यां श्री. श्रीमती
 मुद्रांक
 20 JUL 2013S 449584
 20 JUL 2013

State Bank of India,
 Industrial Finance Branch,
 Natraj Building, 201, 1st Floor,
 194, Sir M. V. Road, Andheri (East),
 Mumbai - 400 069.

श्री. राजेंद्र दळवे

STATE BANK OF INDIA,
 INDUSTRIAL FINANCE BRANCH,
 NATRAJ BUILDING, 102, 1ST FLOOR, 194, SIR M.V.ROAD,
 WESTERN EXPRESS HIGHWAY, ANDHERI (EAST),
 MUMBAI - 400 069.
 TEL. : 26819760 / 730
 FAX : 26831648

PERFORMANCE SECURITY BANK GUARANTEE

Mumbai,
 Date : 19-09-2013

TO,
 THE CHIEF ENGINEER
 WORLD BANK PROJECTS, ODISHA
 NIRMAN SOUDHA,
 KESHARI NAGAR, UNIT - V,
 BHUBANESHWAR - 751 001


DEAR SIRs,

GUARANTEE NO
 AMOUNT OF GUARANTEE
 GUARANTEE COVER FROM
 LAST DATE FOR LODGEMENT OF CLAIM

0473213BG0000701
 :
 : INR 11,00,00,000/-
 : 19-09-2013 TO 18.09.2014
 : 18.09.2014

Cont...2...



(Signature)
 धितारा
 धितारा
 VALECHA ENGINEERING LIMITED
 Contractor


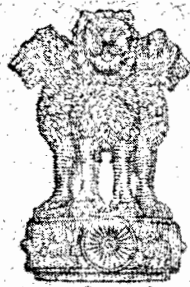
(Signature)
 Chief Engineer,
 World Bank Projects, Odisha
 Employer
 07a The E.I.C. Civil, Odisha
 Bhubaneswar

भारतीय गैर न्यायिक

एक सौ रुपये

Rs. 100

रु. 100



सत्यमेव जयते

ONE HUNDRED RUPEES

भारत INDIA
INDIA NON JUDICIAL

श्री. गजेंद्र हरिश्चंद्र दत्ता

महाराष्ट्र MAHARASHTRA

प्रधान मुद्रांक कार्यालय, मुंबई
प. मु. चिके का क्र. १९३

18 JUL 2013

सक्षम अधिकारी

परमाना धारक मुद्रांक निकाश क्र. १९३

शिव श्यामी दुर्गा देवता मठ, नारायण जयकु

आगरा चौक, नारायण जयकु (प.), मुंबई

क्रमांक. १९३

मन्त्री श्री/श्रीमती

मुद्रांक

परमाना धारक मुद्रांक निकाश

हरी

State Bank of India,
Industrial Finance Branch,
Natraj Building, 201, 1st Floor,
194, Sir M. V. Road, Andheri (East),
Mumbai - 400 089

HS 449585

20 JUL 2013

20 JUL 2013

-2-

THIS DEED OF GUARANTEE IS EXECUTED BY THE STATE BANK OF INDIA, CONSTITUTED UNDER THE STATE BANK OF INDIA ACT, 1955 HAVING THE CENTRAL OFFICE AT NARIMAN POINT, MUMBAI AND AMOUNGST OTHER PLACES A BRANCH AT INDUSTRIAL FINANCE BRANCH, ANDHERI (E) (HEREIN AFTER REFERRED TO AS 'THE BANK') IN FAVOUR OF **THE CHIEF ENGINEER, WORLD BANK PROJECTS, ODISHA** (HEREIN AFTER REFERRED TO AS 'BENEFICIARY') FOR AN AMOUNT NOT EXCEEDING **INR 11,00,00,000/- (RUPEES ELEVEN CRORES ONLY)** AT THE REQUEST OF **VALECHA ENGINEERING LIMITED.**

THIS GUARANTEE IS ISSUED SUBJECT TO THE CONDITION THAT THE LIABILITY OF THE BANK UNDER THIS GUARANTEE IS LIMITED TO A MAXIMUM OF **Rs.11,00,00,000/- (RUPEES ELEVEN CRORES ONLY)** AND THE GUARANTEE SHALL REMAIN IN FULL FORCE UP TO **18.09.2014** AND CANNOT BE INVOKED OTHERWISE THAN BY A WRITTEN DEMAND OR CLAIM UNDER THIS GUARANTEE SERVED ON THE BANK ON OR BEFORE THE **18.09.2014.**

SUBJECT TO AS AFORESAID

Cont...3...

0473213BG0000701 dt 19-09-2013

Noted

Chitara
नवीन चितारा
NAVEEN CHITARA
C-48

VALECHA ENGINEERING LIMITED
Contractor



Volume-I: Page 94 of 100



Chief Engineer,
World Bank Projects, Odisha
Employer
World Bank Project
Civil, Udr
Bhubaneswar

We have been informed that **M/s.Valecha Engineering Limited** having its Registered Office at 'Valecha Chambers', 4th Floor, New Link Road, Andheri (West), Mumbai – 400053 (hereinafter called "the Contractor") is awarded with Letter of Acceptance no.PMU-WB-21/2013 - 34477 dated 08.08.2013 by you, for the execution of the Civil Works ICB Package No.OSRP-CW-ICB-P04A under the proposed Odisha State Roads Project with World Bank Assistance for "Widening & Strengthening of existing carriageway to 2-lane road from Jagatpur to Duhuria (Km. 0/0 to Km. 49/0 of MDR)" (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 **State Bank of India, Industrial Finance Branch, Natraj Building, 102, 1st Floor, 194, Sir M.V.Road, Western Express Highway, Andheri (East), Mumbai – 400 069** hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of **Rs.11,00,00,000/- (Rupees Eleven Crores 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 **18th day of September, 2014** 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) is hereby excluded.

The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed 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.

Notwithstanding anything contained hereinabove :

- Our liability under this Bank Guarantee shall not exceed **Rs.11,00,00,000/- (Rupees Eleven Crores Only)**
- This Bank guarantee shall be valid upto **18.09.2014**; and
- We are liable to pay the guaranteed amount or any part thereof under this bank guarantee only and only if you serve upon us a written claim or demand on or before **18.09.2014**.

0473213BG0000701 dt 19-09-2013



वॉलेच / कृते भारतीय स्टेट बैंक / बैंक
For STATE BANK OF INDIA
Authorised Signatory
Industrial Finance Branch,
102, Nataraj, W.E. Highway,
Andheri (East), Mumbai-400069.



वॉलेच / कृते भारतीय स्टेट बैंक / बैंक
For STATE BANK OF INDIA
Authorised Signatory
Industrial Finance Branch,
102, Nataraj, W.E. Highway,
Andheri (East), Mumbai-400069

VALECHA ENGINEERING LIMITED
Contractor

नवीन चितारा
NAVEEN CHITARA
C - 4872

Chief Engineer,
World Bank Projects, Odisha
Chief Engineer,
World Bank Projects,
Civil Engineering Division,
Government of Odisha,
Bhubaneswar.

Form FIN – 3: Financial Resources

[Specify proposed sources of financing, such as liquid assets, unencumbered real assets, lines of credit, and other financial means, net of current commitments, available to meet the total construction cash flow demands of the subject contract or contracts]

Financial Resources		
No.	Source of financing	Amount in INR
1	Current Commitments Rs. 1897.99 crore	Rs. 1897.99 crore Cash flow required Rs. 189 crore. Available credit lines Rs. 289 crore from State Bank of India. So, net available credit lines : Rs. 289-Rs. 189 = Rs. 100 crore
2	State Bank of India Credit Amount Rs. 289 crore	
3		



भारतीय स्टेट बैंक
भारतीय स्टेट बैंक
State Bank of India

ऑफिसियल विक्रेता, अधरी-102, पदसाल-194, एन.ए. रोड, न.ए. 400 069
प.सू. भाग-स्टेट बैंक ऑफ इंडिया, मुंबई-400 069
ऑफिसियल विक्रेता, अधरी-102, पदसाल-194, एन.ए. रोड, न.ए. 400 069
प.सू. भाग-स्टेट बैंक ऑफ इंडिया, मुंबई-400 069
Industrial Finance Branch, Andhra, 102, Andra, 194, S. No. 102,
W. T. Highway Metro Junction, Andhra, Mumbai, S. No. 102

Tel: 2681 8700, 2682 3370, 2682 1010 • Fax: 2681 648, 2682 300 • Email: sbi@sbicoinfotech.com • Website: sbi.co.in

IFB-AND-FRM 11/2012 13-110

Date
13/09/2017

Ref No.

SOLVENCY CERTIFICATE

TO WHOM IT MAY CONCERN

This is to certify that to the best of our knowledge and information furnished by Mr. Vailecha Engineering Ltd. having their registered office at Vailecha Chambers, 4th Floor, E-6, New Link Road, Andheri West, Mumbai 400059, a customer of our Bank can be considered solvent up to Rs. 289.00 Crores (Rupees Two Hundred Eighty Nine Crores Only).

It is further notified that this certificate is issued without attaching any risk and responsibility on the part of the Bank or its officers in any respect whatsoever more particularly as either a guarantor or otherwise. This certificate is issued at the specific request of the above named customer.

FOR STATE BANK OF INDIA

CHIEF MANAGER & RELATIONSHIP MANAGER



VAILECHA ENGINEERING LIMITED
Contractor



Chief Engineer,
World Bank Projects, Odisha
Employer
World Bank Project
Civil (E.C.Civil), Odisha
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]' 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 _____,

¹ 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.


VALECHA ENGINEERING LIMITED
Contractor




Chief Engineer,
World Bank Projects, Odisha
Employer

2____,² whichever is earlier. Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date..

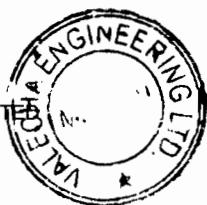
This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 458.

[signature(s)]

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

² *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 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."*

VALECHA ENGINEERING LIMITED
Contractor



Chief Engineer,
World Bank Projects, Odisha
Employer
Office of the Chief Engineer,
World Bank Projects, Odisha
P.O. No. 100, Bhubaneswar

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])¹ 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].

¹ The Guarantor shall insert an amount representing the amount of the second half of the Retention Money or 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.



VALECHA ENGINEERING LIMITED
Contractor



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

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.



VALECHA ENGINEERING LIMITED
Contractor



Volume-I: Page 100 of 100



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



GOVERNMENT OF ODISHA
WORKS DEPARTMENT

CIVIL WORKS CONTRACT

[PACKAGE No. OSRP-CW-ICB-P04A]

For

Widening & Strengthening of existing carriageway to 2-lane road from
Jagatpur to Duhuria (Km. 0/0 to Km. 49/0 of MDR)

under

Odisha State Roads Project

between

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

and

M/s VALECHA ENGINEERING LIMITED

Valecha Chambers, 4th Floor, Plot No. –B-6,
New Link Road, Andheri (W), Mumbai-400053
Ph: +91 22 26733625, Email:ho@valecha.in

[VOLUME-II: Conditions of Contract]

Agreement Value: Rs. 151,30,58,562.00

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

Dated: 23th September, 2013

CONTENTS of CONTRACT

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

CONTENTS of VOLUME - II


Sl.	Description	Page No.
1	PARTICULAR CONDITIONS	1
	PART – A : Contract Data	2
	PART B : Specific Provisions	7
	Annexure – A1 : Salient features of some major Labour Laws applicable to establishments engaged in Construction of Civil works	14
	Annexure All : Safety and Welfare Provisions for labour to be employed by the Contractor.	17
2	GENERAL CONDITIONS	23

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.


VALECHA ENGINEERING LTD.
Contractor




Chief Engineer,
World Bank Projects, Odisha
the E.I.C., Civil, Odisha
Shubaneswar.
Employer

Part A - Contract Data

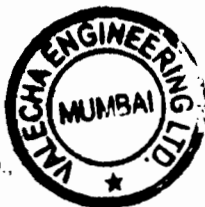
Conditions	Sub-Clause	Data
Employer's name and address	1.1.2.2 & 1.3	Chief Engineer, World Bank Projects, Odisha, O/o the E.I.C(Civil), Odisha, Nirman Soudha, Unit-V Bhubaneswar – 751 001
Engineer's name and address	1.1.2.4 & 1.3	To be intimated later
Bank's name	1.1.2.11	International Bank for Reconstruction 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> 11.850 Kms in different stretches, will be handed over for execution prior to issuance of advance payments under Clause 14.2 as detailed below. Km. 11/000 to Km.16/000 & Km 28/400 to Km 35/250 <u>Section-II</u> 11.00 Kms in different stretches, will be handed over for execution within 4 months of date of commencement as detailed below. Km 3/000 to Km 6/000, Km 8/000 to Km



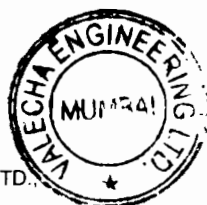
Conditions	Sub-Clause	Data
		<p>10/000 & Km 20/000 to Km 26/000 <u>Section-III</u> 13.750 Kms in different stretches, will be handed over for execution within 8 months of date of commencement as detailed below. Km 35/250 to Km 49/000</p> <p>Section-IV Balance 12.400 Km in different stretches will be handed over for execution within 12 months of date of commencement as detailed below. Km 0/000 to Km 3/000, Km 6/000 to Km 8/000, Km 10/000 to Km 11/000, Km 16/000 to Km 20/000 & Km 26/000 to Km 28/400</p> <p>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.</p> <p>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.</p>
Engineer's Duties and Authority	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 imposed pursuant to Sub-Clause 3.1 of Particular Conditions
Performance Security	4.2	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



Conditions	Sub-Clause	Data
		<p>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 and</p> <p>(b) additional security for unbalanced bids determined in accordance with the Cl.34.5 of ITB</p>
Normal working hours	6.5	<p>08:00 Hours to 18:00 Hours</p> <p>Except otherwise stipulated by the Government of Odisha in exceptional climatic conditions.</p>
Commencement of Works	8.1 (c)	Possessions of sites shall be given as mentioned in Sub-Clause 2.1 above.
Delay damages for the Works	8.7 & 14.15(b)	Refer to Table: Summary of Sections below
Maximum amount of delay damages	8.7	10 % of the final Contract Price.
Provisional Sums	13.5.(b)(ii)	NIL
Adjustments for Changes in Cost	13.8	Period "n" applicable to the adjustment multiplier "Pn": 3 months
Total advance payment	14.2	<p><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.</p> <p>The Bank Guarantee required towards security of 'advance payment for mobilization' shall be 110% of the amount of advance.</p> <p>If the contract is terminated due to default of the contractor under Clause 15, the advance towards mobilization would be deemed as interest bearing advance at an interest rate of 15.5% p.a to be compounded quarterly.</p>



Conditions	Sub-Clause	Data
Repayment amortization rate of advance payment	14.2(b)	10 % Repayment will begin when amount of work certified by the Engineer attains 30% of the Contract Price
Percentage of Retention	14.3	10 %
Limit of Retention Money	14.3	5 % of the Accepted Contract Amount
Plant and Materials	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.
Minimum Amount of Interim Payment Certificates	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.
Publishing source of commercial interest rates for financial charges in case of delayed payment	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.
Maximum total liability of the Contractor to the Employer	17.6	The accepted contract amount
Periods for submission of insurance: a. evidence of insurance.	18.1	14 days



Conditions	Sub-Clause	Data
b. relevant policies		28 days
Maximum amount of deductibles for insurance of the Employer's risks	18.2(d)	<i>US\$ 5000 or Rs. 250,000 per occurrence</i>
Minimum amount of third party insurance	18.3	<i>Rs. 50,00,000 per occurrence with unlimited number of occurrences</i>
Date by which the DB shall be appointed	20.2	84 days after the Commencement date
The DB shall be comprised of	20.2	Three Members from IRC panel
List of potential DB sole members	20.2	<i>None</i>
Appointment (if not agreed) to be made by	20.3	<i>Secretary General of Indian Roads Congress.</i>
Rules of arbitration	20.6(a)	<i>Rules and Procedures laid out for Arbitration & Reconciliation Act, 1996 of Government of India</i>

Table: Summary of Sections

Section Name/Description (Sub-Clause 1.1.5.6)	Time for Completion (Sub-Clause 1.1.3.3)	Damages for Delay (Sub-Clause 8.7)
Section-I: 11.85 Kms as mentioned in Cl. 2.1	14 (Fourteen) Months from Commencement of Works	<u>INR. 210,000 per day</u>
Section-II: 11.00 Kms	17 (Seventeen) Months from Commencement of Works	<u>INR. 200,000 per day</u>
Section-III: 13.75 Kms	23 (Twenty-three) Months from Commencement of Works	<u>INR. 250,000 per day</u>
Section-IV: Balance 12.40 Kms	27 (Twenty-seven) Months from Commencement of Works	<u>INR. 220,000 per day</u>



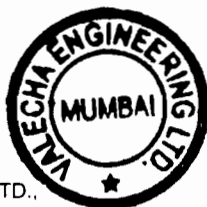
Part B - Specific Provisions

<p>Clause 1.5 Priority of Documents</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"> a. the Contract Agreement (if any), b. the Letter of Acceptance, c. the record of pre-award clarifications (if any), d. the letter of Tender, e. the addenda (if any) f. the Particular Conditions- Part-A-Contract Data g. the Particular Conditions-Part-B-Specific Provisions, h. the General Conditions i. Works Requirement <ul style="list-style-type: none"> (a) Part-I General Specifications (b) Part-II-Supplimentary Technical Specifications including additional Technical Specifications. (c) Part-III-Technical Specifications for Building Work j. the Drawings (k) the Priced Bill of Quantities (l) the Environment Management Plan (EMP) and (m) any other documents forming part of the Contract
<p>Sub-Clause 4.1 Contractor's General Obligations</p>	<p>Add the following at the end of 5th 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>

	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.
Clause 4.2 Performance Security	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'
Clause 4.4 Sub-Contractors	Replace the words 'the whole of Works' with 'more than 30% of the Works in terms of value including the Work subcontracted to
Clause 4.7 Setting Out	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."
Clause 4.14 Avoidance of Interference	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.
Sub-Clause 6.4 Staff and Labour	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



Sub-Clause 7.3 Inspection	Amend the first line of last para as follows: The Contractor shall give “ not less than 48 (forty eight) hours ” notice to the Engineer whenever any...
Clause 8.3 Programme	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.
Clause 10.1 Taking Over of Works and Sections	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.’
Clause 12.3 Evaluation	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.
Sub-Clause 14.1 The Contract Price	(Alternative paragraph) (a) Notwithstanding the provisions of subparagraph (b), Contractor's Equipment, including essential spare parts



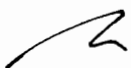
	<p>therefore, imported by the Contractor for the sole purpose of executing the Contract shall be temporarily exempt from the payment of import duties and taxes upon initial importation, provided the Contractor shall post with the customs authorities at the port of entry an approved export bond or bank 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 exported; and (b) on the initial imported value that 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>Clause 14.8 Delayed Payment</p>	<p>Delete 2nd paragraph of Sub-Clause 14.8 and substitute with the following: 'These financing charges shall be calculated at 1% over the PLR rate fixed by Reserve Bank of India to commercial banks for payments in local currencies (INR) and at 2 % over the 3-month's London Inter Bank Offer Rate (LIBOR) for foreign currencies. Delete the words 'and without prejudice to any other right or remedy' from the last paragraph of Sub-Clause 14.8.</p>



<p>Clause 14.13 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</p> <p>Replace the word '28' with '42' in the last paragraph of Sub-Clause 14.13</p>
<p>Clause 14.15 Currencies of Payment</p>	<p>Replace sub paragraph (e) of sub-Clause 14.15 with the following:</p> <p>'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>17.2 Contractor's Care of the Works</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"> 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. 2. Shoulders : In case of failure to maintain the shoulders , a penalty shall be levied at the rate Rs.500/- per km per day. <p>(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> <p>1.Diversion:- (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.</p>



	<p>2.Part Road Barricading:- (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.</p> <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"> 1. Not filling up of the post of Environment and Safety Officer- Penalty @ Rs. 50,000/- per month 2. No proper sanitation & waste disposal arrangements at the labour camp site- Penalty @ Rs. 10,000/- per single violation compounded to Rs. 50,000/- at any single instance 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 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 5. Improper disposal of debris/ residues- Penalty @ Rs. 10,000/- per single violation compounded to Rs. 50,000/- at any single instance 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 7. Persons not using Personal Protective Equipments (PPE)- Penalty @ Rs. 200/- per single violation per person 8. Burrow area/ quarry management not done- Penalty @ Rs. 10,000/- per location per instance.
<p>Clause 20.6 Arbitration</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 & 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</p>




	<p>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. If agreed to by both the parties, the disputes shall be settled in accordance with the Arbitration and Reconciliation Act, 1996 or any statutory amendment thereof. The arbitral tribunal shall consist of three Arbitrators, one each to be appointed by the Employer and the Contractor. The third Arbitrator shall be chosen by the two Arbitrators so appointed by the parties, and shall act 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 Authority specified in the Bid Data Sheet. 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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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.



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:

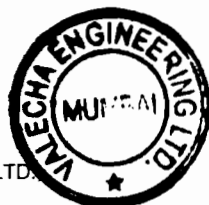
- a) All roads and open areas adjacent to the work site shall either be closed or suitably protected.
- b) No electric cable or apparatus, which is liable to be a source of danger other than a cable or apparatus used by operators, shall remain electrically charged:
- c) All practical steps shall be taken 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

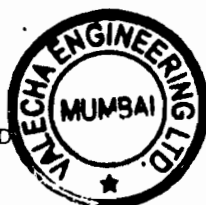
The contractor shall not employ Child Labour for any works or in any manner under the Contract at any time. In the event that the Contractor uses child labour, the Employer shall terminate the Contract.

(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

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Section VII. General Conditions (GC)

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

***Widening & Strengthening of existing carriageway to 2-lane Road from
Jagatpur to Duhuria (Km. 0/00 to Km. 49/00 of MDR)***

***under
Odisha State Roads Project***

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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).

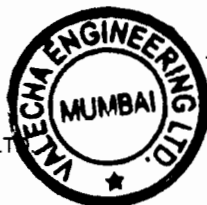

1.1.2.4 “Engineer” means the person appointed by the Employer to act as the Engineer for the purposes of the Contract and named in the Contract Data, or other person appointed from time to time by the Employer and notified to the Contractor under Sub-Clause 3.4 [Replacement of the Engineer].

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



VALECHA ENGINEERING LTD
Contractor

Chief Engineer,
World Bank Projects, Odisha
Employer
The Engineer's Office
Bhubaneswar

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 Money and Payments

- 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].



- 1.1.4.6 “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.



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.



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.

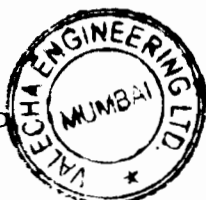
However, if and to the extent that the Engineer's failure was caused by any error or delay by the Contractor, including an error in, or delay in the submission of, any of the Contractor's Documents, the Contractor shall not be entitled to such extension of time, Cost or profit

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



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:



- (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



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.

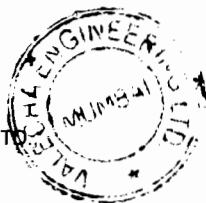
Except as otherwise stated in these Conditions:

- (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



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.

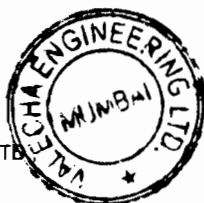
The Contractor shall comply with the instructions given by the Engineer or delegated assistant, on any matter related to the Contract. Whenever practicable, their instructions shall be given in writing. If the Engineer or a delegated assistant:

- (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.

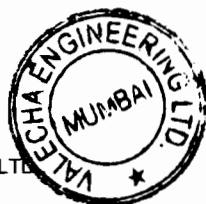

VALECHA ENGINEERING LTD
Contractor




Chief Engineer,
World Bank Projects, Odisha
Employer
World Bank Proj. Odisha
to the E.I.C. Civil, Odisha
Bhubaneswar

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.



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



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:



- (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

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.

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

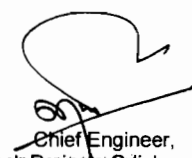
- 6.1 Engagement of Staff and Labour** Except as otherwise stated in the Specification, the Contractor shall make arrangements for the engagement of all staff and labour, local or otherwise, and for their payment, feeding, transport, and, when appropriate, housing.
- The Contractor is encouraged, to 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.



VALECHA ENGINEERING LTD.,
Contractor



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Chief Engineer,
World Bank Projects, Odisha
Employer
Dated: 10/05/2017
3/2/2017

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.



- 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.



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.



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



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:

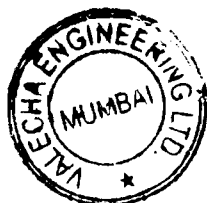
- (a) the Contractor has diligently followed the procedures laid down by the relevant legally constituted public authorities in the Country,
- (b) these authorities delay or disrupt the Contractor's work, and
- (c) the delay or disruption was Unforeseeable,

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
Remedying
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
Remedying
Defects**

All work referred to in sub-paragraph (b) of Sub-Clause 11.1 [Completion of Outstanding Work and Remedying 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.

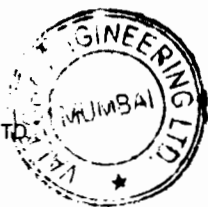
If delivery and/or erection of Plant and/or Materials was suspended under Sub-Clause 8.8 [Suspension of Work] or Sub-Clause 16.1 [Contractor's Entitlement to Suspend Work], the Contractor's obligations under this Clause shall not apply to any defects or damage occurring more than two years after the 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



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_n” 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_n”, “E_n”, “M_n”, ... 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_o”, “E_o”, “M_o”, ... 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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Employer
World Bank Project
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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



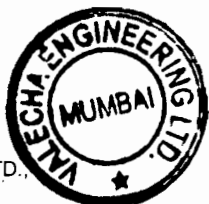
Contractor's Documents produced up to the end of the month (including Variations but excluding items described in sub-paragraphs (b) to (g) below);

- (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 sub-paragraph (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].

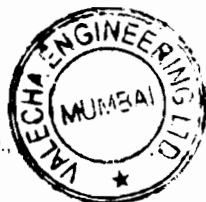
If the lists referred to in sub-paragraphs (b)(i) or (c)(i) below are not included in the Schedules, this Sub-Clause shall not apply.

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.


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Chief Engineer,
World Bank Projects, Odisha
Employer

Chief Engineer
World Bank Project
for the Bank of India, Odisha
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.

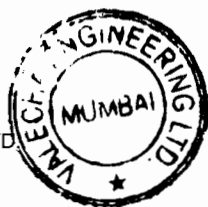
14.9 Payment of Retention Money

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


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

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".

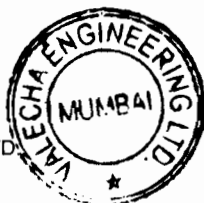
However if, following discussions between the Engineer and the Contractor and any changes to the draft final statement which are agreed, it becomes evident that a dispute exists, the Engineer shall deliver to the Employer (with a copy to the Contractor) an Interim Payment Certificate for the agreed parts 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



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Employer
D/o the E.P.O. Odisha
Bhubaneswar

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:



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Contractor





Chief Engineer,
World Bank Projects, Odisha
Employer
Unit 10, Bhubaneswar, Odisha
751 005

- (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:


VALECHA ENGINEERING LTD
Contractor




Chief Engineer,
World Bank Projects, Odisha
Employer
Plot No. 10, Sector 10,
Indraprastha Extension, Odisha
Bhubaneswar

- (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

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 party⁷;

⁷ "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 obligation⁸;
- (iii) “collusive practice” is an arrangement between two or more parties⁹ 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 party¹⁰ 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

⁸ “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.

⁹ “Parties” refers to participants in the procurement process (including public officials) attempting to establish bid prices at artificial, non competitive levels.

¹⁰ “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

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



- 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:



- (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



Contract.

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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Contractor

Chief Engineer,
World Bank Projects, Odisha
Employer
Bhubaneswar

**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

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.

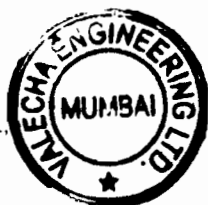
The insuring Party shall maintain this insurance to provide cover until the date of issue of the Performance Certificate, for loss or damage for which the Contractor is liable arising from a cause occurring prior to the issue of the Taking-Over Certificate, and for loss or damage caused by the Contractor 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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World Bank Projects, Odisha
Employer
Chief Engineer,
World Bank Projects,
at the L.C. Chowdhury, Odisha
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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,

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



Personnel

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



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



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



- (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

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

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



VALECHA ENGINEERING LTD.
Contractor

Chief Engineer,
World Bank Projects, Odisha
Employer

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

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.

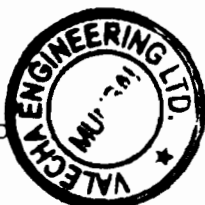
For a DB of three persons, the DB shall be deemed to have received such reference on the date when it is received by the chairman of the DB.

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



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



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].



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



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

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



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-



VALECHA ENGINEERING LTD.,
Contractor




Chief Engineer,
World Bank Projects, Odisha
Employer

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

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

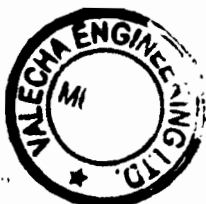
If the Member fails to comply with any of his obligations under Clause 4 (a) - (d) above, he shall not be entitled to any fees or expenses hereunder and shall, without prejudice to their other rights, reimburse each of the Employer and the Contractor for any fees and expenses received by the Member and 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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Chief Engineer,
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Employer
World Bank Project
Orissa
Orissa Civil, Odisha
Bhubaneswar

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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Employer
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Odisha
751005

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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Employer
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Bt. Mansarovar.



GOVERNMENT OF ODISHA
WORKS DEPARTMENT

CIVIL WORKS CONTRACT

[PACKAGE No. OSRP-CW-ICB-P04A]

For

Widening & Strengthening of existing carriageway to 2-lane road from Jagatpur to
Duhuria (Km. 0/0 to Km. 49/0 of MDR)

under

Odisha State Roads Project

between

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

and

M/s VALECHA ENGINEERING LIMITED.

Valecha Chambers, 4th Floor, Plot No. -B-6,
New Link Road, Andheri (W), Mumbai-400053
Ph: +91 22 26733625, Email:ho@valecha.in

[VOLUME-III: Specifications]

Agreement Value: Rs. 151,30,58,562.00

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

Dated: 23th September, 2013

CONTENTS of CONTRACT

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

CONTENTS of VOLUME - III

SPECIFICATIONS

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.



1.2.6 Additional Specifications

The following Clauses have been added to the 'SPECIFICATIONS FOR ROAD AND BRIDGE WORKS (FOURTH REVISION – 2001, Reprint 2006)'.

- A-1 Diversion and filling of existing water courses along the road alignment.
- A-2 Plantation of trees.
- A-3 Void Former.
- A-4 Embankment Construction with Fly Ash Modified Soil

1.2.7 In the absence of any definite provisions on any particular issue in the aforesaid Specifications, reference may be made to the latest codes and specifications of IRC and IS in that order. Where even these are silent, the construction and completion of the works shall conform to sound engineering practice as approved by the Engineer and in case of any dispute arising out of the interpretation of the above, the decision of the Engineer shall be final and binding on the Contractor.

1.2.8 The provisions of special conditions of contract, those specified elsewhere in the tender document, as well as execution drawings and notes, or other specifications issued in writing by the Engineer shall form part of the technical specifications of this project.

1.3 PART – III- Specifications for Building Works

1.4 PART – IV- Specifications and Guidelines for Environment Mitigation Plan



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PART – I

The General Technical Specifications shall be the “SPECIFICATIONS FOR ROAD AND BRIDGE WORKS” (FOURTH REVISION – 2001, Reprint 2006), as corrected in the original issued by the Ministry of Shipping , Road Transport & Highways(MORTH), Government of India and published by the Indian Roads Congress (IRC), with a cross reference to relevant Bureau of Indian Standards (BIS) for materials, testing acceptance or other such aspects not covered by the IRC.

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



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.

Clause 109 Setting Out

**Clause 109.8 Add the following Para in the end of Clause 109.8
Surveying Equipments and Personnel**

The Contractor shall provide the necessary surveying equipment, accessories, and surveyors and labours required for setting out and related measurements, including making available these to the Engineer and his representatives at different stages of the work. The surveying equipments shall meet the quality standards and shall be approved by the Engineer, in good working condition, available in adequate numbers and shall include interaila the following.

- i) Precision automatic level with micrometer attachment with tripods and leveling staff reading to 5mm accuracy by direct observation 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.”



Clause 110 Public Utilities**Clause 110.2 Revise the clause as under**

The Contractor's programme must take into account the period of notice and duration of diversionary works of each body as existing at site. The Contractor must also allow for any effect or these services and alterations upon the Works and for arranging regular meetings with the various bodies at the commencement of the Contract and throughout the period of the Works in order to maintain the required co-ordination. During the period of the Works, the contractor shall have no objection if the public utility bodies vary their decisions in the execution of their proposals in terms of programme and construction, provided that, in the opinion of the Engineer, the Contractor has received reasonable notice thereof before the relevant alterations are put in hand.

Clause 110.3 Add the following paragraph at the end of this Sub-clause.

Any utility services likely to be affected by the contractor's work shall be brought to the notice of the Engineer/ employer and such work shall be undertaken only after getting written clearance from the Engineer.

Clause 111 Precautions for Safeguarding the Environment

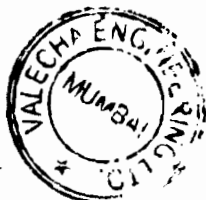
This whole clause shall be modified by following.

Clause 111.1 General**The clause shall be read as follows**

The contractor shall take all precautions for safeguarding the environment during the course of the construction of works. He shall abide by all rules, regulations and laws in force governing pollution and environmental protection that are applicable to the area where the works are situated.

On completion of the Works, all areas disturbed by the Contractor's construction activities shall be restored in their original condition, or as per the plan agreed prior to commencement of construction activities.

The cost of 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 borrow pit. The contractor shall operate strictly adhering to the Borrow 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 Borrow 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).

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 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 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	84 Nos

	with 3nos reflecting sticker in each	
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.

Clause 112.3

Passage of Traffic along a Temporary Diversion

Replace the clause with following

Temporary diversion to carry traffic, either at the site of cross drainage structures which are to be replaced or at any other locations, shall comply with the following:

- a) Embankments as per clause 305. The use of fly ash in temporary diversions will not be permitted.
- b) Pavement 5.5m wide consisting of 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.

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)	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 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.

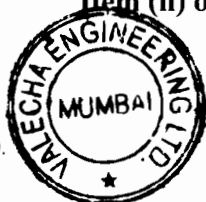
Clause 113 General Rules for the Measurement of Works for Payment:**Clause 113.2 Measurements for Lead of Materials**

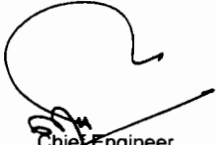
Delete this Clause and replace with

“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**


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Chief Engineer,
World Bank Projects, Odisha
Employer
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No. 100, Bhubaneswar, Odisha

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 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.

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

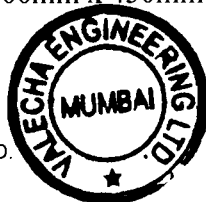
1 No.

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

i)	Liquid limit and plastic limit	
a)	Liquid limit device with Casagrande and grooving tools and as per IS – 2720	2 Nos.
b)	Single point LL device	1 No.
c)	Moisture content cans	50 Nos.
d)	Ground glass plate with rounded edges 600mm x 600mm x 10mm	2 Nos.
ii)	Hydrometer analysis	
a)	High speed stirrer with stainless still beaker	1 No.
b)	Soil hydrometer set including jar	1 Set
iii)	Sampling pipettes fitted with pressure and suction inlets, 10ml. Capacity	1 Set
iv)	Laboratories compaction	
a)	Compaction apparatus (Proctor) complete with collar, base plate & 2.5kg rammer	2 Nos.
b)	Compaction apparatus (heavy) complete with collar, base plate and 4.5kg rammer	3 Nos.



v)	Sand pouring cylinder (150mm) with conical funnel and top and base plate (with 152mm dia of sand cone)	4 Sets
vi)	Sampling tins with lids 100mm dia x 75mm ht. 1/2kg capacity	30 Nos.
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. |
| v) | Marshall compaction apparatus and complete with electrically operated automatic loading unit, compaction pedestal, heating unit, head breaking assembly, flow meter, load transfer bar, specimen moulds 100mm dia with base plate, collars, specimen extractor, compaction hammer 4.53kg x 457mm fall, (excluding constant temperature bath) | 1 Set |
| vi) | Digital type thermometer reading 0-300° C range, accuracy 2° C | 2 Nos. |
| viii) | Ring and Ball Apparatus as per IS 1205 - 1978 | 1 Set |
| x) | Tar Viscometer IS 1206 (Part III) – 1978 | 1 Set |
| xi) | Apparatus for Determination of Ductility Test as per IS 1208 – 1978 | 1 Set |
| xii) | Pen Sky – Marten closed Tester for testing flash and fire point as per IS 1209 – 1978 | 1 Set |
| xv) | Apparatus for Determination of Loss on Heating IS-1212-1978 | 1 Set |
| xvi) | Apparatus of Determination of specific Gravity IS-1202-1978 | 1 Set |
| xv) | Automated Asphalt content gauge (Nuclear or equivalent) | 1 Set |

D. For control of profile and surface evenness

- | | | |
|------|--|---------|
| iii) | Towed Fifth Wheel Bump Integrator | 1 No. |
| iv) | Camber templates 3-lane straight run cross-section | 4 Sets. |

E. For Cement, Cement Concrete and other Materials

- | | | |
|-----|---|---------|
| i) | Vicat needle apparatus for setting time with plungers, as per IS-269-1968 | 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.
ix)	Core cutting machine with 10cm dia diamond cutting tool	1 No.
x)	Needle vibrator	1 No.
xi)	Air entrainment meter	1 No.
xii)	Le-Chatelier apparatus for Soundness testing of cement	1 Set
xiii)	Blain Air Permeability apparatus	1 No.

All equipments shall confirm to accepted National/ International standards and shall be subject to the approval of the Engineer.

Full complement of listed equipment procured from an internationally reputed manufacturer, after procurement and approval of Engineer shall be incidental to the work and no payment shall be made to the Contractor.

Clause 121.3.5 Add New Sub-Clause:

For Control of Profile and Surface Evenness

i)	Theodolite	2 sets
ii)	Total Station	2 sets
iii)	Precision automatic level	4 sets
iv)	Precision staff	4 sets
iv)	Camber templates full width and half width	
	a) Crown type cross-section	4 sets each
	b) Straight run cross-section	4 sets each
	Invar /Steel Tape a) 3 m long	4 sets
	b) 5 m	4 sets
	c) 10 m	4 sets
	d) 20 m	4 sets
	e) 30m	4 sets
	f) 50m	4 sets

Clause 121.3.6 Add New Sub-Clause:



In addition to clause 121.3, any equipment which is not mentioned in this clause but which is necessary for the work for complying with the provisions of the contract and Section 900 of MORTH specifications or as required by the engineer shall be provided by the contractor. No extra payment shall be made to the contractor and it will be considered as incidental to the work.

Clause 121.6 Deleted.

Clause 121.7 Substitute this Sub-Clause by the following:

“There is no separate item in the Bill of Quantities for establishing and maintenance of the laboratory and supply, erection maintenance of equipment and also running cost of testing. The rates quoted for the items in the BOQ by the Contractor shall be deemed to cover the cost of all these items.”

Clause 122 Deleted

Clause 124 Deleted

Clause 125.2 Replace the last but one line with :

The contractor shall supply the digital form of the printed photographs clearly recorded in 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 1st line of the last para

The photographs and materials including digital version in CD shall form a part

Clause 126.1 Replace the last line of the 1st para

The video 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.”

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


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World Bank Project, Odisha
Employer
District Engineer, Civil
Bhubaneswar

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.”

Clause 305 Embankment Construction

Clause 305.2 Materials and General Requirements

Clause 305.2.1 Physical requirements

Clause 305.2.1.5 Add the following at the end of first sentence

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.

Clause 305.4.4 Embankment and Sub-grade around structures.

Para-3 delete the last line and substitute it with

“compacted thoroughly to 98% MDD”.

Clause 305.4.6 Embankment construction under water.

Insert the following as the second para

At locations where water table is high and the soil has potential for rapid and relatively great migration of moisture by capillarity, provision of sand blanket of 100mm thickness of approved grain size shall be provided at a level of 200 mm below bottom of subgrade by way of cut off extending across the full width of the embankment so that the same will act as an effective capillary cut off as per IRC:34

Clause 305.4.7 Earth work for High embankment

The second para shall be read as follows

To ensure stability during construction, it is necessary to control rate of construction especially in both side approaches of ROB's and Bridges which is achieved by stage construction i.e. each period of construction activity is followed by a period of inactive period. The embankment foundation shall be prepared and a drainage layer provided.

No embankment work shall proceed until the foundation have been inspected by the Engineer-in-Charge and approved. In the first month the total height of construction should be limited to maximum 6.0metre only. The balance embankment construction should be done after a rest period of two months for strength gain and consolidation. The rest period need not be given in case the construction of initial 6-metre height of embankment takes more than 4 months time. However, based on the available subsoil data the contractor may suggest his loading schedule or any other method to take care of the excessive settlement problem for approval of the engineer.

Clause 305.9.1 Add “including removal of top soil” after word “materials” appearing in first line of item (v).

Clause 306 Soil Erosion and Sedimentation Control

Clause 306.4 Measurement for payment

Substitute Clause 306.4 as follows

“ All temporary sedimentation and pollution control works shall be deemed as incidental to the earthwork and other items of work and as such no separate payment shall be made for the same.”

Clause 306.5 Rates

This Clause shall be deleted

SECTION 400 SUB-BASES, BASES (NON-BITUMINOUS) AND SHOULDERS

Clause 401 GRANULAR SUB BASE

Clause 401.2 Materials
Replace the clause with the following.

The Materials to be used for the work shall be crushed stone aggregate only. The materials shall be free from organic or other deleterious constituent and confirm to Grading I of Table 400-2.

Clause 406. WET MIX MACADAM SUB-BASE/BASE

Clause 406.2. MATERIALS

Clause 406.2.1 Aggregate

Clause 406.2.1.1 Physical requirements:

Add at the end of first paragraph

The fraction of materials passing through 4.75 mm sieve shall be crusher run screening only. The river sand or quarry sand shall not be

permitted either as such or mixed with crusher-run-screening in the Wet Mix Macadam.

Add the following at the end of the paragraph:

Soundness test shall be carried out in accordance with IS : 2386 (Part-5). The average loss of weight of coarse aggregate after 5 cycles shall not exceed 12% when tested with sodium sulphate and 18% when tested with magnesium sulphate as specified in IS: 383.

Clause 406.3. CONSTRUCTION OPERATIONS

Clause 406.3.1. Preparation of base

404.3.1 shall be applicable by replacing the work “Water Bound Macadam” by “Wet Mix Macadam”.

Clause 406.3.3 Replace first para with :

Wet Mix Macadam shall be prepared in an approved mixing plant of suitable capacity having provision for controlled addition of water and forced/positive mixing arrangement like pugmill.

Add the following at end of 2nd para

Unless otherwise instructed by the Engineer , the moisture content at the time of compaction shall be between 80% and 120% of the optimum moisture content

Clause 406.3.4 Add after the second para with the following:

All the layers of WMM course shall be spread only by a 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 consist 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/m².

The correct quantity of primer will be the maximum amount that can be absorbed by the surface without causing run-off of excessive primer (some times referred as "finger" to form at the lower edges of the primed area) and is to be decided by the supervising engineer at the site.

Clause 502.3 Weather and Seasonal limitations

Replace the clause as follows

Bitumen emulsion grade SS-1 as well as Cutback Bitumen as Primer shall not be applied on wet surface. The moisture content in the



surface to be primed shall not exceed 3.5%. Primer shall not be applied during dust storm, rainy, foggy or windy weather. The ambient temperature during priming by bitumen emulsion should be above 10⁰C.

Clause 502.4 Construction

Clause 502.4.1 Equipment

Replace the clause as follows

All equipment required for execution of priming work shall be in good working condition at site. The primer distributor shall be a self propelled or towed bitumen pressure sprayer equipped for spraying the material uniformly at specified rates and temperature. Hand spraying of small areas using pressure hand sprayer may be permitted at specific strategic locations, where distributor is not accessible or if narrow strips of granular surface are to be primed. Pouring of Primer using perforated can should not be permitted. SS-1 grade bitumen emulsion stored at site in the tank shall have arrangement like circulation pump to ensure its proper mixing before withdrawal from tank and transfer to browser.

Clause 502.4.2 Preparation of road surface

Replace the clause as follows

The base course surface to be primed shall be swept clean and made free from dust. All loose material and other foreign material on the surface shall be removed completely. Power brooms or mechanical sweepers may be used for cleaning of surface. The surface to be primed (whether with SS-1 emulsion or cutback bitumen) should be kept dry. If Soil /Moorum binder has been used in the WBM surface, part of this should be brushed and removed up to a depth of 2mm so as to provide good bond.

The dilution of SS-1 bitumen emulsion is not permitted.

Clause 502.4.3 Application of Primer

Replace the clause as follows

After the base to be primed has been prepared as in section 502.4.2, the primer shall be uniformly applied using the appropriate equipment at application rate. The spraying should preferably be carried out using pressure sprayer or distributor. The quantity of primer shall be checked periodically using tray coating test. The method of application of primer will also depend on the type of equipment to be used, size of nozzles, pressure at spray bar and speed of the forward

movement of vehicle. A trial section shall be laid to check the efficacy of equipment and penetration depth of the primer.

Temperature of Application of primer

No heating of SS-1 Bitumen Emulsion is permitted at site.

In case of cutback bitumen, temperature of application of primer should be high enough to permit the prime to be sprayed effectively through the jets of the spray bar and to cover the base course surface effectively. The temperature of product at the time of application should be more than 10⁰C.

Clause 502.4.4 Curing of Primer and opening for traffic

Replace the clause as follows

The primed surface shall be allowed to cure for at least 24 hours or such other period as is found to be necessary to allow all the volatiles to evaporate before any subsequent surface treatment or mix is laid. Excessive and unabsorbed primer if any shall be blotted with an application of sand using the minimum quantity possible. A primed surface shall not be opened for traffic other than that necessary to lay the next bituminous course.

Clause 503 Tack Coat

Clause 503.1 Scope

Replace the clause as follows

The work shall consist of a very light application of liquid bituminous material to an existing bituminous, cement concrete or primed granular surface to ensure a bond between the surface being paved and the overlaying course. The tack coat material is not expected to penetrate into pavement and for this reason; the applications should be very light to provide adequate bond strength between two layers.

Clause 503.2 Materials

Replace the clause as follows

The binder used for tack coat shall be Cationic Bitumen Emulsion RS-1 confirming to IS 8887.

Clause 503.3 Weather and Seasonal Limitations

Replace the clause as follows

Bituminous material shall not be applied during a dust storm or when the weather is foggy, rainy or windy or when the ambient temperature is less than 10⁰C.

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-I Bitumen Emulsion is not permitted. The quantity of bitumen emulsion to be applied over primer treated WMM surfaces shall be 0.25-.35 Kg/m².

Clause 503.4.4 Curing the tack coat

Replace the clause as follows

After application of the Emulsion as tack coat, allow the bitumen emulsion to break i.e. turn black before placing the bituminous mixture or overlay. Traffic should be kept off of the area where tack coat is being sprayed. No Plant or vehicles shall be allowed on the tack coat other than those essential for construction.

Clause 503.8 Rate

Replace 0.2 kg /m². with 0.30 kg/m² in fourth line.

Clause 507.3.4 Add the following line at the end of the clause.

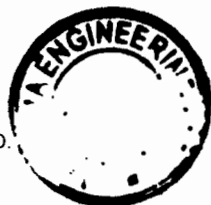
The mix shall be produced only in a batch type hot mix plant of required capacity. In no case materials from drum type hot mix plants shall be entertained.

Clause 509.1 Add the following after 2nd line of this para.

Where modified bitumen is specified to be used as a binder shall have a softening point not less than 60⁰ C & specification as prescribed in IRC SP 2002 Cl.7 for CRMB or PMB as approved by the Engineer. "Modified bitumen shall be product from the refinery".

Clause 509.2.5 In Table 500.18, for grading 2 ,for 13mm nominal size aggregate, the cumulative % by weight of total aggregate passing against 13.2 sieve will be 90-100 instead of 79-100 .

Clause 509.3 Mixture Design



Clause 509.3.1 The requirements set out in table 500-19 will be replaced by table 500-11(A) & 500-11(B).

SECTION 600 CONCRETE PAVEMENTS

Clause 601 Dry Lean Cement Concrete sub-base

Clause 601.1 Scope

Clause 601.1.1 The para will be replaced as follows:

The work shall consist of construction of dry lean concrete sub base for cement concrete pavement in accordance with the requirements of these Specifications as well as of IRC:15 and in conformity with the lines, grades and cross-sections shown on the drawings or as directed by the Engineer. The work shall include furnishing of all plant and equipment, materials and labour and performing all operations, in connection with the work, as approved by the Engineer.

Clause 601.5. Construction

Clause 601.5.2 Batching and Mixing

Add as new sub-clause

Clause 601.5.2.1 Semi-Mechanised and Labour-Oriented Construction Technique

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

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, 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 required	Nil

ment	
-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 m².

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.

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 (UNTESTED)

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 use. Fluid mixes can be pumped satisfactory after adding plasticizers and super plasticizers. Suitability of concrete shall be verified by trial mixes and by performing pumping test.

Clause 1707 Equipment**Para 1 of this Clause shall read as under**

“Unless specified otherwise, equipment for production, transportation and compaction of concrete shall be as under:

- a) For production of concrete: Batching and mixing of the concrete shall be done in a concrete batching and mixing plant fully automatic of a suitable capacity. The plant shall be approved by the Engineer. 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

Clause 2816

Railing / Parapets

Cast-in-situ railing/ parapets shall be constructed in accordance with the requirements of structural concrete section 1700. The reinforcement shall conform to section 1600. The formwork shall conform to section 1500. The work in general shall conform to section 2700 clause 2703.

The reinforcement of the railings/ parapets shall be welded with the existing reinforcement of the deck slab and with the dowel bars as shown in the drawings or as directed by the Engineer.



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


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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 ± 1 percent. The particle shall be of nearly spherical shape with a diameter of 0.35 ± 0.05 micrometer. The manufacturer shall certify the above requirements about solid content and grain size. In order to keep control over the quality, the manufacturer shall provide infra red absorption spectrum analysis for the materials (polymer latex) to be supplied by them.

Portland Cement conforming to IS:8112 shall be used for production of polymer modified cement repair mortar and polymer modified cementitious coating system, which is to be used as a bonding medium concrete substrata.

Acrylic polymer latex shall be used as the polymer for modifying and improving the properties of cement. The same product is to be used for various purposes such as in a slurry form with cement to form a bonding /priming medium and with sand to form PMC repair mortar. However, no additional water is to be added to PMC slurry or PMC repair mortar as the water which is present in the latex is sufficient for cement hydration and for this reason the latex cement ratio remain constant for all applications.

The sand which is to be used for constituting the PMC repair mortar should be Silica sand as the basic material which is categorized in two groups:

- a) Coarse Silica sand
- b) Fine Silica

The gradings of the above groups should follow the limits provided below.

Polymer Modified Cementitious (PMC) Mortar

The specifications for polymer modified cementitious material (PMC) shall be read as under

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 35°C

Under unusual weather conditions e.g. high humidity and / or high wind velocity or imposed constraints special curing procedures shall be followed for which approval shall be obtained from the Engineer.

Air-drying shall be considered to be taken place only during favourable uninterrupted weather conditions existing throughout the existing recommended drying period. Some judgement shall be made in this respect and if conditions are deemed unfavourable for drying to occur, then drying must be prolonged for the full-recommended period after weather clears.

As PMC work proceeds, precautions shall be taken to prevent rapid drying of the PMC repair mortar. This is usually accomplished by covering the filled surfaces with an impermeable sheet shortly after the work has been done.

The sheet shall be kept in place until further work is carried out over the mortar or in case where the mortar is likely to be disturbed the sheet shall be kept in place for 24 hours.

No foot traffic for further work shall be allowed over mortar until 12 hours from the time of the completion of work.

Curing compound may also be used as curing membrane. Care shall be taken to ensure complete covering particularly around the interface with the host concrete.

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.



PART III

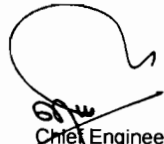
TECHNICAL SPECIFICATIONS FOR BUILDING WORKS

This part shall comprise the latest "Specifications for Building Works" Volume I to Volume IV, 1995 as published by the Central Public Works Department, Govt. of India and deemed to be bound into this document.

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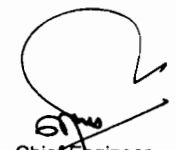

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PART IV

ENVIRONMENT MANAGEMENT PLAN


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ENVIRONMENTAL MANAGEMENT PLAN

S. No.	Environmental Issue/Aspect	Management Measures
E.1	Tree Cutting	The Contractor shall not cut or damage trees except that are required to be felled for construction of traffic diversion works and facilities, after obtaining necessary permission for felling of the same from the authorities.
E.2	Joint Field Verification	The Engineer and the Contractor will organize and carry out joint field verification to ascertain the possibility of saving environmental and community resources. The complaints/suggestions together with the observations and expert opinion of the joint verification team containing the need for additional protection measures or changes in design/scale/nature of protection/management measures shall be well documented with other requisite details such as date, time, place and signature of the individuals involved. Approval will be accorded by the Engineer in consultation with the Project Authority.
E.3	Location and installation of Crushers, Hot-mix Plants and Batching Plants	<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 proposed location plan (including survey number/s of the land parcel/s under consideration, area, land-use and surrounding features) and seek prior approval of the Engineer before entering into any formal agreement with land owner/s for setting-up such construction facilities. The Contractor will formalize agreement with land owner/s only after a written approval has been accorded by the Engineer.</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 will not be proposed within 500 mts. From</p> <ol style="list-style-type: none"> a. a settlement/habitation b. water source and c. reserved or protected forest limits

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S. No.	Environmental Issue/Aspect	Management Measures
		<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 proposed location plan (including survey number/s of the land parcel/s under consideration, area, land-use and surrounding features) and seek prior approval of the Engineer before entering into any formal agreement with land owner/s for setting-up construction camps. The Contractor will formalize agreement with land owner/s only after a written approval has been accorded by the Engineer.</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>
E.5	Construction Vehicles, Equipment and Machinery	<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 the designated burrow areas will be as approved by the Engineer and in accordance to the IRC recommended practice for burrow</p>



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Management Measures	
S. No.	Environmental Issue/Aspect
	<p>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	<p>Identification, Operation and Rehabilitation of Stone Quarry</p> <p>The Contractor shall submit the proposed location plan (including site details, survey number/s of the land parcel/s under consideration, area and quantum of material proposed to be used, land-use, photograph/s of the site and surrounding features within 500 mts.) and seek prior approval of the Engineer before entering into any formal agreement with land owner/s in case of a new quarry site or with the owner/operator in case use of an existing quarry is proposed.</p> <p>No quarry and/or crusher units shall be 'selected' or 'used', which is within 1000 mts. from a human habitation, forest boundary and wildlife habitats/movement areas.</p> <p>The Contractor shall obtain necessary legal permission/s from Department of Mines, Govt. of Orissa and the District Administration, SPCB 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	<p>Identification, and Operation of Sand Quarry</p> <p>The Contractor shall submit the proposed location plan (including details of the site/s under consideration, proposed quantum of material extraction and surrounding features) and seek prior approval of the Engineer. No sand quarry shall be opened within 500 mts. from wildlife movement zones and forest areas.</p> <p>In the event of selection of a new site for sand quarrying, the Contractor shall obtain prior approval and concurrence from Competent District Authority, the local Tehsildar and the Engineer keeping in view the objections and convenience of the local population. Where the supplier of sand is another party, the authentic copy of lease agreement that has been executed between the local Tehsildar and the supplier has to be submitted to the Engineer before any procurement of material is made from such a site.</p>

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Management Measures	
S. No.	Environmental Issue/Aspect
	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.
E.9	<p>Arrangement for Construction Water</p> <p>The Contractor shall submit the proposed location plan (including site details; type of the source under consideration; its usage by other consumers; proposed quantum of water extraction) and seek prior approval of the Engineer. To avoid disruption/disturbance to other water users, the Contractor will extract water only from the approved locations and shall seek a written approval of the Engineer before finalizing and using any such water source – whether ground or at surface.</p> <p>Use of ground water facility shall be subject to the local legislation; ground water availability in the area and the granting of necessary permission by the Competent Authority. The Contractor shall pay the royalty for use of such water as decided under the relevant norms. A copy of the permission obtained from the Competent Authority shall be submitted to the Engineer prior to the use of any such source. The possibility/ permission for sinking of bore wells adjacent to nalas and streams may be examined, such that while the water requirement for the road construction activity is met and these structures when abandoned can help in ground water recharge after suitable modification.</p>
E.10	<p>Clearing and Grubbing</p> <p>All works shall be carried out by the Contractor in a manner such that the damage or disruption to flora is minimal. Only ground cover/shrubs that impinge directly on the permanent works or necessary temporary works will be removed with prior approval from Engineer.</p>
E.11	<p>Stripping, stacking and preservation of top soil</p> <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> <p>(a) Stockpile will be such that the slope does not exceed 1:2 (vertical to horizontal), and height is restricted to 2 m. (b) To retain soil and to allow percolation of water, the edges of the pile will be protected by silt fence. (c) Multiple handling kept to a minimum to ensure that no compaction occurs. (d) Such stockpiles shall be covered with empty gunny bags or will be planted with grasses to prevent loss during rains.</p> <p>Such stockpiled topsoil will be utilized for -</p> <p>➤ Covering reclamation sites or other disturbed areas including burrow areas (other than those in barren areas)</p>



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Management Measures	
S. No.	Environmental Issue/Aspect
	<p>➤ Top dressing of road embankment and fill slopes</p> <p>➤ Filling up of tree pits and</p> <p>➤ In the agricultural fields of farmers, acquired temporarily that need to be restored.</p> <p>Residual topsoil, if there is any, will be utilized for the plantation works along the road corridor.</p> <p>The utilization as far as possible shall be in the same area/close to the same area from where the top soil was removed. The stripping, preservation and reuse shall be closely supervised and properly recorded by the Engineer.</p>
E.12	Labour Camp Management
12.1	<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	<p>The Contractor shall ensure the fulfillment of the following conditions:</p> <p>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.</p> <p>b) All open wells will be entirely covered and will be provided with a trap door to prevent accidental fall and contamination from dust, litter etc. A reliable pump will be fitted to each covered well.</p> <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	<p>The Contractor shall ensure that -</p> <p>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.</p> <p>d) Separate toilets and bathrooms for women workers wherever required, screened from those of men, are provided with markings in vernacular language.</p> <p>e) All such facilities must have adequate water supply with proper drainage and disposal facility.</p> <p>f) All toilets in workplaces are to be maintained, cleaned and disinfected daily using proper disinfectants.</p> <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>

Management Measures	
S. No.	Environmental Issue/Aspect
	<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. All these facilities shall be inspected on a weekly basis by the Engineer to check the hygiene standards.</p>
E.13	<p>Transportation of Construction Materials and Haul Road Management</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	<p>Traffic Diversions</p> <p>This shall be done according to the provisions of Technical Specifications Cl. 112.</p>
14.2	<p>Traffic Safety</p> <p>This shall be done according to the provisions of Technical Specifications Cl. 112</p>
14.3	<p>Safety of Workers</p> <p>The Contractor will make sure that during the construction work all relevant provisions of the Factories Act, 1948 and the Building and Other Construction Workers (Regulation of Employment and Conditions of Services) Act, 1996 are adhered to. The Contractor will comply with all the precautions as required for ensuring the safety of the workmen as per the International Labor Organization (ILO) Convention No. 62 as far as those are applicable to this contract.</p> <p>The Contractor shall provide and ensure enforcement with zero tolerance on the following:</p> <ol style="list-style-type: none"> Protective footwear and protective goggles to all workers employed handling asphalt materials, cement, mortar, concrete, blasting and crusher operations. Welder's protective eye-shields and protective footwear to workers engaged in welding works. Earplugs to workers exposed to high noise levels.



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S. No.	Environmental Issue/Aspect	Management Measures
14.4	Risk from Electrical Equipment(s)	<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"> ▪ A readily available life saving first aid kits including an adequate supply of sterilized dressing materials and appliances as per the Factories Rules in every work zone. ▪ Availability of suitable transport at all times to take injured or sick person(s) to the nearest hospital. ▪ Equipment and trained nursing /paramedical staff at construction camps. ▪ Periodic health checks for workers.



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Management Measures	
S. No.	Environmental Issue/Aspect
14.6	Risk Force Majeure
	<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. Construction over and close to the non-perennial streams shall be undertaken in dry season and if such activity is likely to disrupt, constrain or impact the community use of the water body, adequate prior information (at least two weeks in advance) will be provided to such a community. Such water body may be ponds, water harvesting structures (WHS), feeder channels to pond, irrigation sources etc. If the supply of water or access to a source is being completely cut off, then the Contractor shall make necessary arrangements to provide water in the interim period. Water quality test shall be done prior to providing / supplying the water.</p>
E.17	Labour Requirements
	<p>The Contractor preferably will use labour drawn from local areas to provide maximum benefit to the local community especially to the vulnerable individuals/groups living in the project area.</p>



R
VALECHA ENGINEERING LTD.
Contractor

Management Measures	
S. No.	Environmental Issue/Aspect
E.18 Pollution Management	
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>	
18.3	Water Pollution from Fuel, Lubricants and
<p>Garage, service stations, refueling stations and equipment maintenance yards shall be so located at least 100 mts. away from kitchen, mess and drinking water facilities within the camp site.</p> <p>The Contractor shall ensure that all vehicles, machinery and equipment are operated (including re-fuelling) and maintained in</p>	



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Contractor

2

Chief Engineer,
Water Resources Dept., Odisha
C/o the E.I.C.(Civil), Bhubaneswar.

Management Measures	
S. No.	Environmental Issue/Aspect
	Chemicals
	<p>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"> a) All plants and equipment used in construction (including those of sub-Contractors and/or suppliers such as aggregate crushing plants) shall strictly conform to the MoEF/PCB noise standards and shall have latest noise suppression mountings. b) All vehicles and equipment used in construction will be fitted with exhaust silencers. c) Servicing of all construction vehicles and machinery will be done regularly and during routine servicing operations, the effectiveness of exhaust silencers will be checked and if found defective, these shall be replaced. d) Maintenance of equipment, machinery and vehicles (including proper lubrication, tuning, checks for muffler effectiveness) shall be regular and up to the satisfaction of the Engineer to keep noise levels under control. e) Construction activity at sites within 100m habitations and hospitals shall not be carried out during night (10:00 pm to 06:00 am). f) Construction activity at sites within 500m from wildlife movement zones, reserved and protected forest areas shall not be carried out between 06:00 pm to 06:00 am. g) Blasting operations, if any shall be carried out with full safety precautions and in compliance with measures as specified in the legal provisions. <p>Monitoring shall be carried out by the Contractor in presence of the Engineer at the construction sites as per the Noise Monitoring Plan provided in this EMP and results shall be shared with the Engineer.</p>
E.19	Drainage and Flood Control
	<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</p>

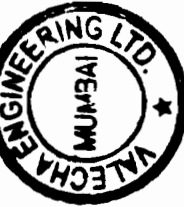


VALECHA ENGINEERING LTD.
Contractor

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

Management Measures	
S. No.	Environmental Issue/Aspect
E.20	Slope Protection and Control of Soil Erosion
	<p>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> <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"> a) 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. b) Turfing works will be taken up as soon as possible provided the season is favorable for the establishment of grass sods. c) 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. d) Along sections abutting water bodies, stone pitching, as laid out in the design, will be provided to protect slopes.
E.21	Waste Management
21.1	Waste Management – Planning and Identification of Disposal Sites
	<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>
21.2	Re-use and Disposal of Debris Generated from Dismantling of Structures and
	<p>Debris generated due to the dismantling of the existing road will be suitably re-used in the proposed construction as follows:</p> <ul style="list-style-type: none"> ▪ The dismantled scraps of bitumen will be disposed off through utilization for the paving of cross roads, access roads and paving works in construction sites and campus, temporary traffic diversions, haulage routes, parking areas along the corridor or in any other manner approved by the Engineer. ▪ At locations identified for disposal of residual bituminous wastes, the disposal will be carried out over a 60 mm thick layer of



VALECHA ENGINEERING LTD.
Contractor

S. No.	Environmental Issue/Aspect	Management Measures
	Road Surface	<p>rammed clay so as to eliminate the possibility of leaching of wastes into the ground water.</p> <ul style="list-style-type: none"> ▪ The Contractor will suitably dispose off unutilized non-toxic debris either through filling up of burrows areas located in wasteland or at pre-designated disposal sites, subject to the approval of the Engineer. ▪ Debris generated from pile driving or other construction activities along the rivers and streams drainage channels shall be carefully disposed in such a manner that it does not flow into the water body. ▪ Non-bituminous wastes may be dumped in burrow pits (preferably located in barren lands) where such burrow pits are not suitable to develop as a economic source like pisci-culture or a source of irrigation. Such burrow pits can be filled up with non-bitumen wastes and then covered with a minimum 30cm layer of the soil, where plantation of trees and shrubs can be taken-up. <p>The Contractor at his own cost shall resolve any claim, arising out of waste disposal or any non-compliance that may arise on account of lack of action on his part.</p>
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>
E.22	Chance Found Archaeological Property	<p>All fossils, coins, articles of value of antiquity, structures and other remains or things of geological or archaeological interest discovered on the site shall be the property of the Government and shall be dealt with as per provisions of the relevant legislation.</p>
E.23	Demobilization and Decommissioning	<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;</p>



VALECHA ENGINEERING LTD.
Contractor

S. No.	Environmental Issue/Aspect	Management Measures
		<p>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>



VALECHA ENGINEERING LTD.
Contractor




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

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 ²)			
3	Total Material that can be dumped within the site (m ²)			
4	Depth to which dumping is feasible (m)			
5	Distance of nearest watercourse (m)			
6	Nearest Settlement (m)			
7	Date/s of Community Consultation/s			
8	Whether the community is agreeable to 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 (Totalno.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

Checked

Signature.....

Name.....

Environmental Engineer.
Construction Supervision Consultant

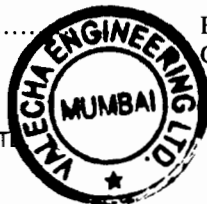
Approved

Signature.....

Name.....

Resident Engineer

VALECHA ENGINEERING LTD
Contractor



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

Form P2

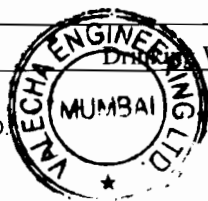
SETTING-UP CONSTRUCTION CAMP AND STORAGE AREA

[One Time Format, to be to be filled by the Contractor & submitted before target date of establishing camps or each time before change of layout]

Location of Camp : _____

Date _____

Sl. No.	Item	Unit	Details
1.	Detail of item camp		
a.	Size of Camp	m x m	
b.	Area of Camp	Sq.m	
c.	Distance from Nearest Settlement		
d.	Distance from Nearest Water Source [Type/Size/Capacity/present Use/Ownership]		
e.	Date of camp being operational dd/mm/yy		
f.	Present land use		
g.	No of trees with girth > 0.3m.		
h.	Details of Storage area (Availability of impervious surface)	Mxm	
i.	Availability of separate waste disposal from storage area	Cum	
2.	Details of topsoil stacking		
a.	Quantity of top soil removed	Sq.m	
b.	Details of storage of topsoil [Describe stacking arrangement]		
3.	Details of workforce		
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.	Details of dwelling units		
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	
g.	Flooring	Specifications	
h.	Water Tank	Specifications	



i.	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.	Details of facilities		
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 Itr)	Nos	

Encl:

- Site Layout of Construction camp Attached/ Not Attached
- Drawings of dwelling units with allied facilities Attached/ Not Attached

Remarks

Submitted	Checked	Approved
Signature.....	Signature.....	Signature.....
Name.....	Name.....	Name.....
Designation..... Contractor	Environmental Engineer. Construction Supervision Consultant	Resident Engineer



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. _____
 Material _____
 [Give chainages and nearest settlements from both ends]

Sl. No.	Location			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)	Area m x m			Before	After

- Photograph of Proposed Site
- Location Map
- Agreement with Land Owner

Attached/ Not Attached
 Attached/ Not Attached
 Attached/ Not Attached

Submitted

Signature.....
 Name.....
 Designation.....
 Contractor

Checked

Signature.....
 Name.....
 Environmental Engineer.
 Construction Supervision Consultant

Approved

Signature.....
 Name.....
 Resident Engineer



VALECHA ENGINEERING LTD.
 Contractor

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

ESTABLISHMENT OF HOT MIX PLANT /BATCH MIX PLANT
 [To be submitted by Contractor for taking permission from PMU]

Link _____


Sl. No.	Location			Area (m ²)	Distance from nearest Water Course (m)	Distance from nearest Settlement	Existing Land Use	Prevalent Wind Direction	Weather in Down Wind Direction (Y/N)	Approved by EO (Y/N)	Remark
	Name of Village	Chainage (km)	Side (LHS /RHS)									Haul road length (m)

1. Photograph of Proposed Site Attached/ Not attached
2. Site Plan Attached/ Not attached
3. Permission from OSPCB Attached/ Not attached (Valid upto _____)

Submitted	Checked	Approved
Signature.....	Signature.....	Signature.....
Name.....	Name.....	Name.....
Designation.....	Environmental Engineer.	Resident Engineer
Contractor	Construction Supervision Consultant	



VALECHA ENGINEERING LTD.
Contractor


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

Form P5

ROAD SAFETY REPORTING FORMATS

[Reporting by Contractor to PMU before commencement of construction in the Working Zone]

Link _____

DIVERSION at location : km _____

Report-Date.....

Sl.	Item	Unit	Remarks
	Details of Construction Zone		
1.	Length of Working Zone	m	
2.	Distance between this and adjacent construction zone	m	
3.	Length of approach transition zone (should be min 50 for a speed of 50 km/ hr)	m	
4.	Length of terminal transition zone	m	
5.	Length of Longitudinal Buffer Zones	m	
6.	Length of Lateral Buffer Zone	m	
	Signage's in advance warning zone		
1.	Sign 'Men at Work' before 200m	Y/N	
2.	Sign 'Men at Work' before working zone	Y/N	
3.	Signage saying 'Compulsory Keep Right /Left' provided	Y/N	
4.	Signage saying 'Narrow Road on left/ right' provided	Y/N	
	Signage in Approach Transition Zone		
1.	Signage saying 'Compulsory Keep Right /Left' provided	Y/N	
2.	Delineators placed along length of transition	Y/N	
	Signage in work zone		
1.	Hazard Marker placed where railing for CD structure on diversion starts	Y/N	
2.	Barricade on either side of work sub zone	Y/N	
	Signage in Terminal transition zone		
1.	Sign for Restriction Ends	Y/N	
	Road Delineator		
1.	Delineator posts provided	Y/N	
2.	Sand bag delineators with Retroreflective stickers provided	Y/N	
3.	Object Makers Provided	Y/N	

1. Sketch of construction zone showing all sub zones and location of signs
Attached

Attached/ Not

2. Format on Acquisition of Temporary diversions
Attached

Attached/ Not

Submitted

Checked

Approved

Signature.....

Signature.....

Signature.....

Name.....

Name.....

Name.....

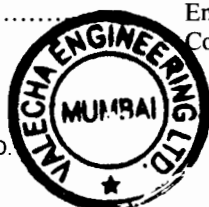
Designation.....

Environmental Engineer.

Resident Engineer

Contractor

Construction Supervision Consultant

VALECHA ENGINEERING LTD.
Contractor

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

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 ²)								Haul road length (m)
1	Burrow Areas BA 1													
2	Workers Camps WC 1													
3	Site for Batching Plant BP 1													
4	Site for Hot Mix Plant HMP 1													
5	Stock Yard SY 1													

Submitted

Signature.....

Name.....

Designation.....
Contractor

Checked

Signature.....

Name.....

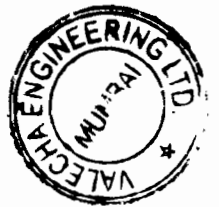
Environmental Engineer.
Construction Supervision Consultant

Approved

Signature.....

Name.....

Resident Engineer



VALECHA ENGINEERING LTD.
Contractor

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

Form P7

IDENTIFICATION OF SOURCE OF WATER FOR CONSTRUCTION

[Monthly Reporting by the Contractor]

Link _____

Report – Date: _____

Sl. No.	Source (Name)	Location /Ch.	Distance from Road	Permission Required	Remarks

Submitted

Signature.....

Name.....

Designation.....
Contractor

Checked

Signature.....

Name.....

Environmental Engineer.
Construction Supervision Consultant

Approved

Signature.....

Name.....

Resident Engineer



DETAILS OF EARTHWORK

[Monthly Report to be filled by the Contractor for Each Burrow Area under use]

Link _____

Month.....

Date of Submission.....

Location of Burrow Area under use

	Name of Village	Chainage (km)	Side (LHS / RHS)	Haul road length (m)
I				
II				

2. Details of Burrow Areas

2.1	Capacity of the Burrow Area	
2.2	Percentage of the capacity exhausted	
2.3	Total quantity of the Earth Excavated (in cum)	
2.4	Quantity of Top Soil removed from the Burrow Areas	
2.5	Location of Top Soil stored removed	
2.6	Quantity of Top Soil stored at the beginning of the month	
2.7	Quantity of Top Soil utilized at the end of the month	
2.8	Location (s) where Top Soil has been utilized (Specify on a location plan)	
2.9	Quantity of earthwork excavation from existing road	
2.10	Total quantity of earthwork reused in cum. (5%)	
2.11	Location disposal (if other than sites) (Specify clearly on a location plan)	
2.12	Quantity of earthwork re-used in fill operation	
2.13	Location of burrow areas in disuse / exhausted	
2.14	Outline a rehabilitation plan for each of the exhausted burrow areas with special reference to Erosion Protection Measures. Also, submit at separate detailed rehabilitation plan for exhausted burrow areas for approval supported adequately with layouts, plans and drawings.	

Remarks

Submitted

Checked

Approved

Signature.....

Signature.....

Signature.....

Name.....

Name.....

Name.....

Designation.....
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

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)
	I				
	II				
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


VALECHA ENGINEERING LTD.
Contractor




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

Form C4

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

Submitted

Checked

Approved

Signature.....

Signature.....

Signature.....

Name.....

Name.....

Name.....

Designation.....
Contractor

Environmental Engineer.
Construction Supervision Consultant

Resident Engineer


VALECHA ENGINEERING LTD.
Contractor




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


 VALECHA ENGINEERING LTD
 Contractor




 Chief Engineer,
 World Bank Projects, Odisha
 Chief Engineer, Employer
 World Bank Project
 O/o the 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

Checked

Signature.....

Name.....

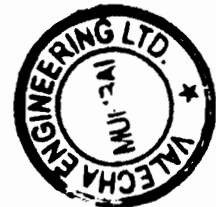
Environmental Engineer.
Construction Supervision Consultant

Approved

Signature.....

Name.....

Resident Engineer



(Handwritten signature)

VALECHA ENGINEERING LTD.
Contractor

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

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

Signature.....

Name.....

Designation.....

Contractor

Checked

Signature.....

Name.....

Environmental Engineer.

Construction Supervision Consultant

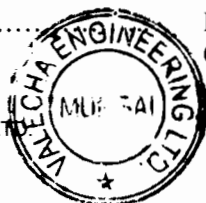
Approved

Signature.....

Name.....

Resident Engineer

VALECHA ENGINEERING LTD
Contractor



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

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 nail 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

Submitted	Checked	Approved
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

Submitted	Checked	Approved
Signature.....	Signature.....	Signature.....
Name.....	Name.....	Name.....
Designation..... Contractor	Environmental Engineer. Construction Supervision Consultant	Resident Engineer



VALECHA ENGINEERING LTD
Contractor




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

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
1. Air Monitoring											
						SPM RSPM HC Sox NOx	SPM RSPM HC Sox NOx				
2. Water Monitoring											
						pH TSS TDS Turbidity Hardness Coliform BOD COD Oil & Grease	pH TSS TDS Turbidity Hardness Coliform BOD COD Oil & Grease				



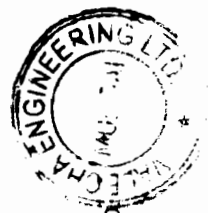
VALECHA ENGINEERING LTD
 Contractor

(Signature)
 Chief Engineer,
 World Bank Project, Odisha
 World Bank Project
 O/o the E.I.C.(Civil), Cuttack
 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
3. Soil Monitoring											
						pH Organic Matter Alkalinity Conductivity Water holding Capacity Pb	pH Organic Matter Alkalinity Conductivity Water holding Capacity Pb				
4.Noise Monitoring											
						L day equivalent L night equivalent L equivalent	L day equivalent L night equivalent L equivalent				

Remark

Submitted	Checked	Approved
Signature.....	Signature.....	Signature.....
Name.....	Name.....	Name.....
Designation.....	Environmental Engineer.	Resident Engineer
Contractor	Construction Supervision Consultant	



(Signature)

VALECHA ENGINEERING LTD
Contractor

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

Form C10

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

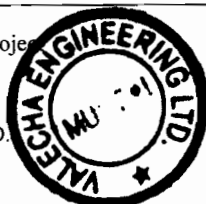
Signature.....

Name.....

Resident Engineer

Orissa State Road Project

VALECHA ENGINEERING LTD.
Contractor



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

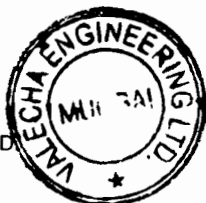
Countersigned


Signature.....

Name.....

Executive Engineer (PMU)


VALECHA ENGINEERING LTD
Contractor




Chief Engineer,
World Bank Projects, Odisha
O/o the E.I.C.(Civil), G.P. S.No. 1,
Bhubaneswar.

Form PMU 2

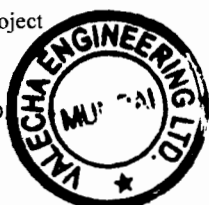
CHECK LIST FOR ENVIRONMENT INSPECTION
[Monthly Format]

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	

Orissa State Road Project

VALECHA ENGINEERING LTD
Contractor



Volume-III: Page 91 of 94

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

c) The arrangement adequate		
13	Safety equipment i.e. helmet, gloves, gumboot, mask, 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)



VALECHA ENGINEERING LTD.
 Contractor




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

Form PMU 3

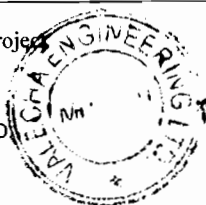
SUMMARY SHEET
[To be filled MONTHLY by PMU]

Month _____ Date _____

Sl. No.	Description	Remarks
1	No Objection Certificate	
A	Hot mix Plant	
	Location 1	
	Location 2	
	Location 3	
B	Cement batching Plant	
	Location 1	
	Location 2	
	Location 3	
2	Pollution Under Certificate	
	Vehicles	
	Machineries	
3	No objection Certificate for Diesel Gen set	
	Location 1	
	Location 2	
4	Labour Camps	
	No. of sites Identified	
	Approved	
	Opened	
	Conforms to conditions imposed at the time of opening of sites	
	Closed	
5	Workers	
	No of workers employed	
	No of male workers	
	No of female workers	
	No of day workers	
6	Burrow Area	
	No. of sites identified	
	Approved	
	Opened	
	Quantity of available material	
	Quantity of material Utilized	
	Quantity of Topsoil preserved	
	Quantity to top soil used	
	No of sites closed	
	No. of sites Rehabilitated	
7.	Quarry	
	No. of sites identified	
	Approved	
	Opened	
	Material available	
	Material obtained	
	No. of sites Rehabilitated	
8	Disposal Locations	
	No. of sites identified	
	Approved	

Orissa State Road Project

VALECHA ENGINEERING LTD
Contractor



Volume-III: Page 93 of 94

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

Sl. No.	Description	Remarks
	Opened	
	Amount of Waste disposed	
	Type of waste disposed	
	No. of sites Rehabilitated	
9	Road Safety	
	Road Safety norms followed as per guidelines, SP-55 and approved Traffic plan	
10	Cleaning of Culvert/ drains	
	No. of culverts/ drains	
	Nos. Cleaned	
11	Trees	
	No of trees marked for cutting in field	
	No of trees cut	
	No of trees to be Planted	
	Trees Planted	
12	Haul Roads	
	Adequacy of maintenance of Haul Road Network	

Remarks

Verified

Signature.....

Name.....

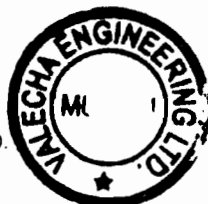
Resident Engineer
Construction Supervision Consultant

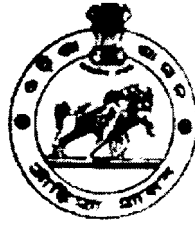
Countersigned

Signature.....

Name.....

Executive Engineer (PMU)





GOVERNMENT OF ODISHA
WORKS DEPARTMENT

CIVIL WORKS CONTRACT

[PACKAGE No. OSRP-CW-ICB-P04A]

For

Widening & Strengthening of existing carriageway to 2-lane road from
Jagatpur to Duhuria (Km. 0/0 to Km. 49/0 of MDR)

under

Odisha State Roads Project

between

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

and

M/s VALECHA ENGINEERING LTD.

Valecha Chambers, 4th Floor, Plot No. –B-6,
New Link Road, Andheri (W), Mumbai-400053
Ph: +91 22 26733625, Email:ho@valecha.in

[VOLUME-IV: DRAWINGS]

Agreement Value: Rs. 151,30,58,562.00

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

Dated: 23th September, 2013

CONTENTS of CONTRACT

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

CONTENTS of VOLUME - IV

Sl.	Description	Page No.
1	JAGATPUR TO DUHURIA (0/0 TO 45/0KM. of MDR)	1
	A. Index, Plan & profile, Specifications, Schedules, TCS, Standard Drawings, Toll Plaza, Bus Bay, Utility Shifting & Environment Drawings, etc.	2-137
	B. Bridges & Culverts	138-160

GOVERNMENT OF ODISHA

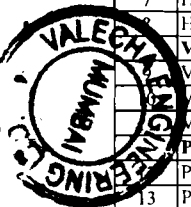
WORKS DEPARTMENT

ODISHA STATE ROAD PROJECT (UNDER WORLD BANK ASSISTANCE)

JAGATPUR TO DUHURIA
KM.0.000 TO KM.49.000

VOLUME - IV

DRAWINGS




SL.	DESCRIPTION	DRAWING NO.
1	Cover Sheet	
2	Index of Highway Drawing	OSRP/CEG/JD-49KM/INDEX/01
3	Index of Standard Drawings	OSRP/CEG/JD-49KM/INDEX/02
4	Index of Structural Drawings	OSRP/CEG/JD-49KM/INDEX/03
5	List of Structure (Culverts)	OSRP/CEG/JD-49KM/INDEX/04
6	List of Structure (Bridges)	OSRP/CEG/JD-49KM/INDEX/05
HORIZONTAL CURVE DETAIL		
7	Horizontal Curve Details (1 of 2)	OSRP/CEG/JD-49KM/HC/01
	Horizontal Curve Details (2 of 2)	OSRP/CEG/JD-49KM/HC/02
VERTICAL CURVE DETAIL		
	Vertical Curve Details	OSRP/CEG/JD-49KM/VC/01
	Vertical Curve Details	OSRP/CEG/JD-49KM/VC/02
	Vertical Curve Details	OSRP/CEG/JD-49KM/VC/03
PLAN & PROFILE		
	Plan & Profile Km. 0/000 to Km.0/750	OSRP/CEG/JD-49KM/P &P/01
13	Plan & Profile Km. 0/750 to Km.1/500	OSRP/CEG/JD-49KM/P &P/02
14	Plan & Profile Km. 1/500 to Km.2/250	OSRP/CEG/JD-49KM/P &P/03
15	Plan & Profile Km. 2/250 to Km.3/000	OSRP/CEG/JD-49KM/P &P/04
16	Plan & Profile Km. 3/000 to Km.3/750	OSRP/CEG/JD-49KM/P &P/05
17	Plan & Profile Km. 3/750 to Km.4/500	OSRP/CEG/JD-49KM/P &P/06
18	Plan & Profile Km. 4/500 to Km.5/250	OSRP/CEG/JD-49KM/P &P/07
19	Plan & Profile Km. 5/250 to Km.6/000	OSRP/CEG/JD-49KM/P &P/08
20	Plan & Profile Km. 6/000 to Km.6/750	OSRP/CEG/JD-49KM/P &P/09
21	Plan & Profile Km. 6/750 to Km.7/500	OSRP/CEG/JD-49KM/P &P/10
22	Plan & Profile Km. 7/500 to Km.8/250	OSRP/CEG/JD-49KM/P &P/11
23	Plan & Profile Km. 8/250 to Km.9/000	OSRP/CEG/JD-49KM/P &P/12
24	Plan & Profile Km. 9/000 to Km.9/750	OSRP/CEG/JD-49KM/P &P/13
25	Plan & Profile Km. 9/750 to Km.10/500	OSRP/CEG/JD-49KM/P &P/14
26	Plan & Profile Km. 10/500 to Km.11/250	OSRP/CEG/JD-49KM/P &P/15
27	Plan & Profile Km. 11/250 to Km.12/000	OSRP/CEG/JD-49KM/P &P/16
28	Plan & Profile Km. 12/000 to Km.12/750	OSRP/CEG/JD-49KM/P &P/17
29	Plan & Profile Km. 12/750 to Km.13/500	OSRP/CEG/JD-49KM/P &P/18
30	Plan & Profile Km. 13/500 to Km.14/250	OSRP/CEG/JD-49KM/P &P/19
31	Plan & Profile Km. 14/250 to Km.15/000	OSRP/CEG/JD-49KM/P &P/20
32	Plan & Profile Km. 15/000 to Km.15/750	OSRP/CEG/JD-49KM/P &P/21
33	Plan & Profile Km. 15/750 to Km.16/500	OSRP/CEG/JD-49KM/P &P/22
34	Plan & Profile Km. 16/500 to Km.17/250	OSRP/CEG/JD-49KM/P &P/23
35	Plan & Profile Km. 17/250 to Km.18/000	OSRP/CEG/JD-49KM/P &P/24
36	Plan & Profile Km. 18/000 to Km.18/750	OSRP/CEG/JD-49KM/P &P/25
37	Plan & Profile Km. 18/750 to Km.19/500	OSRP/CEG/JD-49KM/P &P/26
38	Plan & Profile Km. 19/500 to Km.20/250	OSRP/CEG/JD-49KM/P &P/27
39	Plan & Profile Km. 20/250 to Km.21/000	OSRP/CEG/JD-49KM/P &P/28
40	Plan & Profile Km. 21/000 to Km.21/750	OSRP/CEG/JD-49KM/P &P/29
41	Plan & Profile Km. 21/750 to Km.22/500	OSRP/CEG/JD-49KM/P &P/30
42	Plan & Profile Km. 22/500 to Km.23/250	OSRP/CEG/JD-49KM/P &P/31
43	Plan & Profile Km. 23/250 to Km.24/000	OSRP/CEG/JD-49KM/P &P/32
44	Plan & Profile Km. 24/000 to Km.25/750	OSRP/CEG/JD-49KM/P &P/33

Sl. No.	DESCRIPTION	DRAWING NO.
45	Plan & Profile Km. 25/750 to Km.25/500	OSRP/CEG/JD-49KM/P &P/34
46	Plan & Profile Km. 25/500 to Km.26/250	OSRP/CEG/JD-49KM/P &P/35
47	Plan & Profile Km. 26/250 to Km.27/000	OSRP/CEG/JD-49KM/P &P/36
48	Plan & Profile Km. 27/000 to Km.27/750	OSRP/CEG/JD-49KM/P &P/37
49	Plan & Profile Km. 27/750 to Km.28/500	OSRP/CEG/JD-49KM/P &P/38
50	Plan & Profile Km. 28/500 to Km.29/250	OSRP/CEG/JD-49KM/P &P/39
51	Plan & Profile Km. 29/250 to Km.30/000	OSRP/CEG/JD-49KM/P &P/40
52	Plan & Profile Km. 30/000 to Km.30/750	OSRP/CEG/JD-49KM/P &P/41
53	Plan & Profile Km. 30/750 to Km.31/500	OSRP/CEG/JD-49KM/P &P/42
54	Plan & Profile Km. 31/500 to Km.32/250	OSRP/CEG/JD-49KM/P &P/43
55	Plan & Profile Km. 32/250 to Km.33/000	OSRP/CEG/JD-49KM/P &P/44
56	Plan & Profile Km. 33/000 to Km.33/750	OSRP/CEG/JD-49KM/P &P/45
57	Plan & Profile Km. 33/750 to Km.34/500	OSRP/CEG/JD-49KM/P &P/46
58	Plan & Profile Km. 34/500 to Km.35/250	OSRP/CEG/JD-49KM/P &P/47
59	Plan & Profile Km. 35/250 to Km.36/000	OSRP/CEG/JD-49KM/P &P/48
60	Plan & Profile Km. 36/000 to Km.36/750	OSRP/CEG/JD-49KM/P &P/49
61	Plan & Profile Km. 36/750 to Km.37/500	OSRP/CEG/JD-49KM/P &P/50
62	Plan & Profile Km. 37/500 to Km.38/250	OSRP/CEG/JD-49KM/P &P/51
63	Plan & Profile Km. 38/250 to Km.39/000	OSRP/CEG/JD-49KM/P &P/52
64	Plan & Profile Km. 39/000 to Km.39/750	OSRP/CEG/JD-49KM/P &P/53
65	Plan & Profile Km. 39/750 to Km.40/500	OSRP/CEG/JD-49KM/P &P/54
66	Plan & Profile Km. 40/500 to Km.41/250	OSRP/CEG/JD-49KM/P &P/55
67	Plan & Profile Km. 41/250 to Km.42/000	OSRP/CEG/JD-49KM/P &P/56
68	Plan & Profile Km. 42/000 to Km.42/750	OSRP/CEG/JD-49KM/P &P/57
69	Plan & Profile Km. 42/750 to Km.43/500	OSRP/CEG/JD-49KM/P &P/58
70	Plan & Profile Km. 43/500 to Km.44/250	OSRP/CEG/JD-49KM/P &P/59
71	Plan & Profile Km. 44/250 to Km.45/000	OSRP/CEG/JD-49KM/P &P/60
72	Plan & Profile Km. 45/000 to Km.45/750	OSRP/CEG/JD-49KM/P &P/61
73	Plan & Profile Km. 45/750 to Km.46/500	OSRP/CEG/JD-49KM/P &P/62
74	Plan & Profile Km. 46/500 to Km.47/250	OSRP/CEG/JD-49KM/P &P/63
75	Plan & Profile Km. 47/250 to Km.48/000	OSRP/CEG/JD-49KM/P &P/64
76	Plan & Profile Km. 48/000 to Km.48/750	OSRP/CEG/JD-49KM/P &P/65
77	Plan & Profile Km. 48/750 to Km.49/500	OSRP/CEG/JD-49KM/P &P/66
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78	Schedule of Road Sign Post (1 of 9)	OSRP/CEG/JD-49KM/SCH/01
79	Schedule of Road Sign Post (2 of 9)	OSRP/CEG/JD-49KM/SCH/02
80	Schedule of Road Sign Post (3 of 9)	OSRP/CEG/JD-49KM/SCH/03
81	Schedule of Road Sign Post (4 of 9)	OSRP/CEG/JD-49KM/SCH/04
82	Schedule of Road Sign Post (5 of 9)	OSRP/CEG/JD-49KM/SCH/05
83	Schedule of Road Sign Post (6 of 9)	OSRP/CEG/JD-49KM/SCH/06
84	Schedule of Road Sign Post (7 of 9)	OSRP/CEG/JD-49KM/SCH/07
85	Schedule of Road Sign Post (8 of 9)	OSRP/CEG/JD-49KM/SCH/08
86	Schedule of Road Sign Post (9 of 9)	OSRP/CEG/JD-49KM/SCH/09
87	Schedule of extra Winding	OSRP/CEG/JD-49KM/SCH/17
88	Schedule of Construction Composition Type of Construction	OSRP/CEG/JD-49KM/PAV/01
89	Schedule of Construction Composition Type of Construction	OSRP/CEG/JD-49KM/PAV/02
90	Pavement schedule with type of TC	OSRP/CEG/JD-49KM/PAV/03

Checked by: *[Signature]*
 Prepared by: *[Signature]*
 O/o the E.I.C. (CI)/P.O. Disha
 Bhubaneswar.

PROJECT:- ORISSA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE	INDEX OF HIGHWAYS & SCHEDULES						REV R0 PREPARED BY: CEG Ltd.	REV R1 PREPARED BY EE/PMU	APPROVED CE, World Bank Projects.	
	DRG NO.	OSRP/CEG/JD-49KM/INDEX/01				REV				R1
	SH.NO.	DATE								
	SCALE									

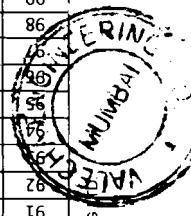

 Chief Engineer,
 Odisha State Engineering
 World Bank Project
 O/o the E.I.C. (Civil), Odisha
 Bhubaneswar.

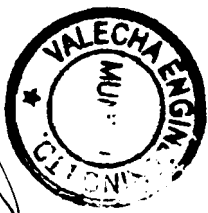
PROJECT:-	ORISSA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE
DRG NO.	OSRP/CEG/INDEX/02
SH. NO.	DATE
SCALE	REV R1
REV NO	PREPARED BY:
REV R1	EE/PMU
APPROVED	CE, World Bank Projects.

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115	Schedule of RPMs
116	Stand. Drawings Typical Road Marking Details (Sheet 1 of 2)
117	Stand. Drawings Typical Road Marking Details (Sheet 2 of 2)
118	Schedule of Pedestrian Crossing
119	Standards Drawings Typical Road Signs (Sheet 1 of 4)
120	Standards Drawings Typical Road Signs (Sheet 2 of 4)
121	Standards Drawings Typical Road Signs (Sheet 3 of 4)
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125	Standard Drawings Toll Plaza Layout
126	Standard Drawings Toll Plaza Main Office
127	Standard Drawings Toll Booth
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130	Standard Drawings Electrical Layout Toll Plaza
131	Standard Drawings Eplumbin Layout - Toll Plaza
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133	Interception Barricade for Institutions
134	Typical arrangement for Reptile Under Pass
135	Typical Arrangement of utility Duct
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SL. NO.	DESCRIPTION
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92	Typical Cross Sections
93	Typical Cross Sections
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97	Typical Detail of Dowel Bar & Tie Bar Arrangement
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99	Typical Details of Transition of Different Road Section
100	Standard Drawings Details of Drains & Kerb
101	Details of Application of Super Elevation
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102	Typical 4-Legged Intersection with single lane BT Road
103	Typical T-junction with Single lane BT Road
104	Typical Y-junction With Single lane BT/Earthen Road
105	Typical - Cross Drainage at Single lane BT Road/Earth Road
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106	Standard Drawings Details of Road Humps & Rumble Strips
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109	Standard Drawings Metal Beam Crash Barrier Details
110	Standard Drawings Typical KM Stone & 5th KM Stone
111	Standards Drawings Typical Details of 200m Stone & Guard post
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113	Standards Drawings Details of Road Deflectors
114	Standards Drawings Details of RPMs & Chevron Markers

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VALECHA ENGINEERING LTD
Contractor

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139	Details of Widening Methodology of Minor Bridges	OSRP/CEG/SH-9A/BR-WD/01
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140	General Arrangement Drawing	OSRP/BR/32+075/01
141	Dimension & Reinforcement Details	OSRP/BR/32+075/02
142	Site plan (Sheet 1 of 2) KM. 32+068	OSRP/BR/32+075/03
143	Site plan (Sheet 2 of 2) KM. 32+068	OSRP/BR/32+075/03
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144	BRIDGE AT PROPOSED CH. 2+145	OSRP/CEG/JD-49km/BR/2+082/01
145	BRIDGE AT PROPOSED CH. 10+545	OSRP/CEG/JD-49km/BR/10+400/01
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148	For R.C.C. Single pipe culverts (1x1.2m Dia)	OSRP/CEG/JD-49km/PIPE CUL-02
149	For R.C.C. Double pipe culverts (2x1.0m Dia)	OSRP/CEG/JD-49km/PIPE CUL-03
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153	General Arrangement Drawing _ Skew Box Cell	OSRP/CEG/JD-49km/BOX CUL-03
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155	Slab Culvert Extension GAD	OSRP/CEG/JD-49KM/SLAB CUL/W-01
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160	Details of Curtain Wall	OSRP/BR/RW/MISC-02

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PROJECT:-		INDEX OF STRUCTURAL DRAWINGS					REV R0		REV R1		APPROVED	
ORISSA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE		DRG NO.	OSRP/CEG/INDEX/02			PREPARED BY:		PREPARED BY		CE, World Bank Projects.		
		SH. NO.	DATE		REV	R1	EE/PMU					
		SCALE										

Chief Engineer
 World Bank Project
 E.I.C. (Q.VII), Odisha
 Bhubaneswar.



LIST OF STRUCTURES (CULVERTS)

VALECHA ENGINEERING LTD.
Contractor

Sl No	Existing Design Change	Design Change	Existing Span Arrangement	Type of Existing Culvert	Now Proposed	Type of Structure	Remarks in New Proposal	Sl No	Existing Design Change	Design Change	Existing Span Arrangement	Type of Existing Culvert	Now Proposed	Type of Structure	Remarks in New Proposal	Sl No	Existing Design Change	Design Change	Existing Span Arrangement	Type of Existing Culvert	Now Proposed	Type of Structure	Remarks in New Proposal
1	0/390	0/390	1x1.0	Pipe	1x1.0	Pipe	Additional Structure(Utility Duct)	41	13/150	13100	1 x 0.3	Pipe	1x1.2	Pipe		86	26/150	26173	1 x 2.0	Slab	2x1.2	Pipe	Utility Duct
2	0/690	0/690	1x1.0	Pipe	1x1.0	Pipe	Additional Structure	42	13150	13150	1 x 0.3	Pipe	1x1.2	Pipe		87	26/500	26306	1 x 0.3	Pipe	1x1.0	Pipe	Pipe skew 15°
3	1/020	1/020	1x1.0	Pipe	1x1.0	Pipe	Additional Structure	43	13/400	13345	1 x 0.3	Pipe	1x1.2	Pipe		88	26/550	26550	1 x 1.0	Pipe	1x1.0	Pipe	Additional Structure(Utility Duct)
4	1/440	1/440	1x1.0	Pipe	1x1.0	Pipe	Additional Structure	44	13820	13820	1 x 0.3	Pipe	1x1.0	Pipe	Utility Duct	89	27/200	27100	1 x 0.75	Pipe	4x1.0	Pipe	
5	1/800	1/800	1x1.0	Pipe	1x1.0	Pipe	Additional Structure	45	14/100	14064	1 x 0.45	Pipe	1x1.0	Pipe		90	27220	27220	1 x 1.0	Pipe	1x1.0	Pipe	Utility Duct
6	2/010	1921	2 x 1.0	Pipe	2x1.0	Pipe	Utility Duct	46	14250	14250	1 x 1.0	Pipe	1x1.2	Pipe		91	27/600	27600	1 x 1.0	Pipe	1x1.0	Pipe	Additional Structure
7	2400	2400	1x1.0	Pipe	1x1.0	Pipe	Additional Structure(Utility Duct)	47	14/550	14550	1 x 0.45	Pipe	2x1.2	Pipe	Additional Structure	92	28/200	28173	1 x 5.2	Slab	1/63/0 check	RCC Skew Box	
8	2800	2800	1x1.0	Pipe	1x1.0	Pipe	Utility Duct	48	14/850	14800	1 x 0.9	Slab	2x1.2	Pipe		93	28/500	28500	1 x 1.0	Pipe	1x1.0	Pipe	Additional Structure(Utility Duct)
9	3100	3100	1x1.0	Pipe	1x1.0	Pipe	Utility Duct	49	15230	15230	1 x 0.9	Pipe	1x1.0	Pipe		94	29/200	29118	1 x 0.9	Arch	1x1.2	Pipe	
10	3360	3360	1x1.0	Pipe	1x1.0	Pipe	Utility Duct	50	15400	15400	1 x 0.9	Pipe	1x1.0	Pipe		95	29/350	29208	1 x 0.8	Arch	1x1.2	Pipe	
11	3360	3360	1x1.0	Pipe	1x1.0	Pipe	Utility Duct	51	16/200	16129	1 x 0.6	Pipe	1x1.0	Pipe		96	29/500	29500	1 x 1.2	Pipe	1x1.2	Pipe	Additional Structure
12	3/850	3/850	1x1.0	Pipe	1x1.0	Pipe	Additional Structure(Utility Duct)	52	16/400	16352	1 x 0.45	Pipe	1x1.0	Pipe		97	29/960	29960	1 x 1.2	Pipe	1x1.2	Pipe	Additional Structure
13	4/300	4/300	1x1.0	Pipe	1x1.0	Pipe	Additional Structure(Utility Duct)	53	16/450	16423	1 x 0.45	Pipe	1x1.0	Pipe	Reptile Pass	98	30/220	30220	1 x 1.0	Pipe	1x1.2	Pipe	
14	5/145	5059	1 x 1.2	Arch	2x1.0	Pipe		54	16/640	16608	1 x 1.5	Slab	2x1.0	Pipe	Utility Duct	99	30/700	30660	1 x 0.9	Pipe	1x1.2	Pipe	
15	5/160	5105	1x0.25	Pipe	DRIFTE	DRIFTE		55	16/930	16886	1 x 1.5	Arch	1/22/0	RCC Skew Box	Utility Duct	100	31/150	31100	1 x 1.0	Pipe	2x1.2	Pipe	Reptile Pass
16	5/415	5415	1x1.0	Pipe	1x1.0	Pipe	Utility Duct	56	17/315	17315	1 x 1.0	Pipe	1x1.0	Pipe	Utility Duct	101	31/460	31460	1 x 1.2	Pipe	1x1.2	Pipe	Additional Structure
17	5/650	5650	1x1.0	Pipe	1x1.0	Pipe	Utility Duct	57	17/550	17500	1 x 1.5	Slab	2x1.0	Pipe	Utility Duct	102	31/680	31680	1 x 1.2	Pipe	1x1.2	Pipe	Additional Structure
18	5/980	5875	1 x 0.7	Pipe	1x1.0	Pipe		58	17/960	17960	1 x 1.0	Pipe	1x1.0	Pipe	Additional Structure	103	32/340	32340	1 x 1.2	Pipe	1x1.2	Pipe	Additional Structure
19	6/290	6151	1 x 0.45	Pipe	1x1.0	Pipe		59	18/190	18165	1 x 0.6	Pipe	1x1.0	Pipe	Utility Duct	104	32/625	32580	1 x 1.2	Pipe	1x1.2	Pipe	Additional Structure
20	6/400	6345	1 x 1.0	Pipe	1x1.0	Pipe		60	18/310	18381	1 x 0.6	Pipe	1x1.0	Pipe	Utility Duct	105	32/650	32600	1 x 0.45	Pipe	1x1.0	Pipe	Additional Structure
21	6/450	6450	1x1.0	Pipe	1x1.0	Pipe	Additional Structure(Utility Duct)	61	18/800	18800	1 x 1.0	Pipe	1x1.0	Pipe	Additional Structure	106	32/900	32978	1 x 6.0	Skew Slab	2/33/0	RCC Skew Box	
22	6/800	6800	1x1.0	Pipe	1x1.0	Pipe	Additional Structure(Utility Duct)	62	19/350	19276	1 x 1.5	Slab	2x1.0	Pipe	Utility Duct	107	33/390	33390	1 x 1.2	Pipe	1x1.2	Pipe	Utility Duct
23	7/711	7711	1x1.0	Pipe	1x1.0	Pipe	Utility Duct	63	19/650	19650	1 x 1.0	Pipe	1x1.0	Pipe	Additional Structure	108	33/710	33710	1 x 1.2	Pipe	1x1.2	Pipe	Utility Duct
24	7/850	7850	1x1.0	Pipe	1x1.0	Pipe	Additional Structure	64	19/950	19938	1 x 2.2	Slab	2x1.0	Pipe	Utility Duct	109	33/950	33950	1 x 1.2	Pipe	1x1.2	Pipe	Reptile Pass
25	8/250	8200	1 x 1.0	Pipe	1x1.0	Pipe	Utility Duct	65	20/420	20420	1 x 1.0	Pipe	2x1.0	Pipe	Additional Structure	110	34/400	34225	1 x 0.6	Slab	2x1.2	Pipe	Utility Duct
26	8/425	8167	1 x 1.0	Pipe	1x1.0	Pipe	Utility Duct	66	20/400	20615	2 x 1.0	Pipe	2x1.0	Pipe	Utility Duct	111	34/598	34598	1 x 1.2	Pipe	1x1.2	Pipe	Utility Duct
27	8/660	8660	1x1.0	Pipe	1x1.0	Pipe	Utility Duct	67	21/060	21060	1 x 1.0	Pipe	1x1.0	Pipe	Utility Duct	112	35/100	35042	1 x 1.5	Slab	1/22/0	RCC Box	Utility Duct
28	8/860	8860	1x1.0	Pipe	1x1.0	Pipe	Utility Duct	68	21/350	21268	1 x 1.5	Slab	2x1.0	Pipe	Utility Duct	113	35/320	35320	1 x 1.0	Pipe	1x1.0	Pipe	Additional Structure
29	9/090	9030	1 x 0.6	Pipe	1x1.0	Pipe	Reptile Pass	69	21/520	21520	1 x 1.0	Pipe	1x1.0	Pipe	Utility Duct	114	35/700	35725	1 x 0.9	Skew Arch	1x1.0	Pipe	Additional Structure
30	965	965	1x1.0	Pipe	1x1.0	Pipe	Additional Structure(Utility Duct)	70	21/800	21752	1 x 0.75	Pipe	1x1.0	Pipe	Utility Duct	115	36/150	36000	1 x 0.6	Pipe	1x1.0	Pipe	Utility Duct
31	9900	9900	1x1.0	Pipe	1x1.0	Pipe	Additional Structure(Utility Duct)	71	22050	22050	1 x 1.0	Pipe	1x1.0	Pipe	Utility Duct	116	36/320	36320	1 x 1.2	Pipe	1x1.2	Pipe	Utility Duct
32	10/140	10100	1 x 1.0	Pipe	1x1.0	Pipe	Additional Structure(Utility Duct)	72	22/350	22400	1 x 0.8	Skew Arch	2x1.0	Pipe	Utility Duct	117	36/400	36546	1 x 0.9	Slab	1x1.2	Pipe	Utility Duct
33	10/925	10885	1 x 3.0	Skew Slab	1/33/0	RCC Skew Box	Utility Duct	73	22/600	22648	1 x 1.2	Arch	2x1.2	Pipe	Utility Duct	118	36/721	36721	1 x 3.0	Skew Slab	1/33/0	RCC Box	Utility Duct
34	11240	11240	1x1.2	Pipe	1x1.2	Pipe	Utility Duct	74	22/950	22895	1 x 0.3	Pipe	2x1.2	Pipe	Utility Duct	119	36/900	36873	1 x 4.5	Slab	1/63/0	RCC Box	Utility Duct
35	11500	11500	2x1.2	Pipe	2x1.2	Pipe	Utility Duct	75	23/200	23158	1 x 0.75	Pipe	1x1.2	Pipe	Pipe skew 15°	120	37/200	37195	1 x 3.0	Slab	1/33/0	RCC Skew Box	Utility Duct
36	11/860	11815	1 x 0.1	Pipe	2x1.2	Pipe	Utility Duct	76	23360	23360	1 x 1.2	Pipe	1x1.2	Pipe	Utility Duct	121	37/700	37580	1 x 0.9	Pipe	1x1.2	Pipe	Utility Duct
37	12/060	12010	1 x 0.3	Pipe	2x1.2	Pipe	Utility Duct	77	23580	23580	1 x 1.2	Pipe	1x1.2	Pipe	Utility Duct	122	37/980	37925	1 x 0.6	Pipe	1x1.0	Pipe	Utility Duct
38	12/375	12316	1 x 1.2	Pipe	2x1.2	Pipe	Utility Duct	78	23/900	23853	1 x 1.22	Arch	2x1.2	Pipe	Utility Duct	123	38/350	38163	1 x 0.9	Slab	1x1.0	Pipe	Utility Duct
39	12/640	12648	1 x 0.1	Pipe	2x1.2	Pipe	Utility Duct	79	24/150	24114	1 x 1.38	Skew Slab	1/22/0	Box 30°	Utility Duct	124	38/600	38795	1 x 3.5	Slab	1/33/0	RCC Box	Utility Duct
40	13/020	12981	2x1.2	Pipe	2x1.2	Pipe	Utility Duct	80	24/450	24470	2 x 0.9	Arch	2x1.0	Pipe	Utility Duct	125	38/950	38937	1 x 1.9	Skew Slab	1/22/0	RCC Skew Box	Utility Duct
								81	24/800	24742	1 x 1.5	Skew Slab	1/22/0	RCC Skew Box	Utility Duct	126	39/400	39400	1 x 1.0	Pipe	1x1.0	Pipe	Additional Structure
								82	25000	25000	1 x 1.2	Pipe	1x1.2	Pipe	Reptile Pass	127	39740	39740	1 x 1.2	Pipe	1x1.2	Pipe	Utility Duct
								83	25/400	25268	1 x 0.3	Pipe	1x1.2	Pipe	Utility Duct	128	39940	39940	1 x 1.2	Pipe	1x1.2	Pipe	Utility Duct
								84	25/500	25579	1 x 0.9	Slab	2x1.2	Pipe	Utility Duct	129	40/175	40174	1 x 1.0	Pipe	1x1.2	Pipe	Reptile Pass
								85	25/995	25971	1 x 1.2	Pipe	1x1.2	Pipe	Utility Duct	130	40440	40440	1 x 1.2	Pipe	1x1.2	Pipe	Reptile Pass
															131	40770	40770	1 x 1.2	Pipe	1x1.2	Pipe	Reptile Pass	

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Prepared by: *[Signature]*
Checked by: *[Signature]*
Date: *[Date]*
Bhuvaneshwar

PROJECT :
STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

CLIENT :-
WORKS DEPARTMENT
GOVT. OF ODISHA

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Fax: 2521348, e-mail: ceg@ceginia.com

LIST OF CULVERTS (JAGATPUR TO DUHURIA)										
DRG NO	OSRP/CEG/JD-49KM/LOS/01				DESIGNED BY	DRAWN BY	REV. KI	APPROVED		
SH. NO.	A	DATE	12/12/12	REV	R-1	CEG	CEG	PREPARED BY	CEG	CE.WBP
SCALE	NTS				CEG	CEG		EE(PMU)		CE.WBP



LIST OF STRUCTURES (BRIDGES)_JAGATPUR - DUHURIA

Sl No.	Existing Chainage	Proposed Chainage	Existing Span Arrangement	Proposed Span Arrangement	Carriageway Width (m)	Final Overall Width of Bridge (m)	Remarks
Jagatpur – DUHURIA							
1	2/145	2082	5 x 8.8	-	10	12	Widening & Rehabilitation required
2	10/400	10545	1 x 8.15	-	10	12	Widening & Rehabilitation required
3	15/900	15857	1 x 8.75	-	10	12	Widening & Rehabilitation required
4	32/075	32068	2 x 3.9	1/85/0	10	12	Reconstruction due to poor condition and narrow width

PROJECT :-
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

CLIENT :-
WORKS DEPARTMENT
GOVT. OF ODISHA

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LIST OF BRIDGES
(JAGATPUR TO DUHURIA)

DRG NO.	OSRP/CEG/JD-49KM/LOB/01					DESIGNED BY	DRAWN BY	REV. RI	APPROVED
SH. NO.	C	DATE	12/12/12	REV	R-1	CEG	CEG	PREPARED BY	CE,WBP
SCALE	NTS								

HORIZONTAL CURVE DETAILS (JAGTPUR - DUHURIA)

VALECHA ENGINEERING LTD.
Contractor



Curve No.	Curve Direction	Transition Start Chainage TS	Curve Start Chainage SC	HIP Details			Total Deflection Angle D	Design Speed V (Km/hr)	Curve Radius R (m)	Transition Length Ls (m)	Circular Curve Length Lc (m)	Tangent Distance Ts (m)	Apex Distance Es (m)	Radial Shift S	Super Elevation e (%)
				Chainage	Easting	Northing									
1	Right		144.424	205.718	387576.983	2266691.750	2d 48' 32.2"	100	2500		123	61.29	0.751	0.0	-2.50
2	Left		384.352	417.087	387782.534	2266672.886	0d 45' 0.8"	100	5000		65	32.74	0.107	0.0	-2.50
3	Left		667.078	690.770	388265.973	2266652.035	0d 8' 8.7"	100	20000		47	23.69	0.014	0.0	-2.50
4	Right		986.956	1062.222	388636.410	2266624.613	1d 43' 29.4"	100	5000		151	75.27	0.566	0.0	-2.50
5	Left		1386.868	1426.869	388999.099	2266586.758	0d 55' 0.2"	100	5000		80	40.00	0.160	0.0	-2.50
6	Right	1783.949	1818.949	1839.871	389410.148	2266547.634	21d 58' 14.9"	50	200	35	42	56.37	3.993	0.3	5.56
7	Left	1920.629	1965.629	1990.246	389548.718	2266490.128	53d 26' 31.6"	50	100	45	48	73.23	12.899	0.9	7.00
8	Right	2109.163	2154.163	2162.977	389709.407	2266554.158	35d 51' 23.7"	50	100	45	18	55.09	5.989	0.9	7.00
9	Left	2239.907	2274.907	2296.483	389841.952	2266540.498	22d 20' 28.9"	50	200	35	43	57.04	4.122	0.3	5.56
10	Right		2454.721	2490.871	390032.129	2266581.123	5d 10' 28.6"	65	800		72	36.15	0.816	0.0	-2.50
11	Right	2625.145	2685.145	2713.208	390252.890	2266607.089	18d 27' 50.5"	80	360	60	56	88.58	5.146	0.4	7.00
12	Left	2939.005	2989.005	3007.459	390543.249	2266559.889	20d 43' 48.8"	65	240	50	37	68.97	4.423	0.4	7.00
13	Left		3522.738	3586.445	391113.983	2266656.875	1d 27' 35.9"	100	5000		127	63.71	0.406	0.0	-2.50
14	Right	5128.572	5218.572	5229.182	392724.960	2266975.889	26d 32' 55.5"	80	240	90	21	101.90	8.031	1.4	7.00
15	Right	5781.057	5848.143	593323.503	393323.503	2266820.239	15d 45' 24.3"	65	360	35	64	67.33	3.573	0.1	5.22
16	Left		6043.239	6103.306	393543.783	2266691.196	8d 35' 16.0"	65	800		120	60.07	2.252	0.0	-2.50
17	Left		6574.015	6648.166	394048.275	2266484.784	10d 35' 28.2"	65	800		148	74.15	3.429	0.0	-2.50
18	Left	6934.518	6959.518	6963.870	394357.976	2266421.409	6d 26' 13.3"	50	300	25	9	29.37	0.561	0.1	3.70
19	Right	7014.313	7039.313	7080.721	394474.057	2266408.185	20d 29' 30.9"	50	300	25	82	66.74	4.950	0.1	3.70
20	Left	7190.696	7215.696	7219.100	394600.268	2266350.244	6d 4' 30.3"	50	300	25	7	28.42	0.509	0.1	3.70
21	Right		7426.34	7467.710	394834.243	2266266.224	5d 55' 14.0"	65	800		83	41.37	1.069	0.0	-2.50
22	Left		7738.715	7824.962	395156.595	2266112.048	5d 29' 11.2"	80	1800		172	86.25	2.065	0.0	-2.50
23	Left		7984.86	8037.410	395356.261	2266039.081	5d 0' 53.8"	80	1200		105	52.55	1.15	0.0	-2.50
24	Right		8498.635	8538.388	395840.097	2265908.897	2d 16' 38.6"	100	2000		79	39.75	0.395	0.0	-2.50
25	Left		9064.507	9112.579	396388.212	2265737.789	2d 45' 13.6"	100	2000		96	48.07	0.578	0.0	-2.50
26	Right	10015.762	10050.762	10091.319	397334.744	2265488.909	18d 25' 33.0"	65	360	35	81	75.91	4.848	0.1	5.22
27	Left	10387.263	10422.263	10440.062	397629.571	2265302.113	11d 13' 53.1"	65	360	35	36	52.91	1.879	0.1	5.22
28	Left	10695.799	10755.799	10789.760	397954.500	2265172.934	9d 9' 31.7"	100	800	60	68	94.09	2.75	0.2	5.56
29	Left		11189.923	11237.196	398390.695	2265073.209	0d 32' 30.2"	100	10000		95	47.27	0.112	0.0	-2.50
30	Left		11917.844	11957.875	399095.423	2264922.422	2d 17' 35.9"	100	2000		80	40.03	0.401	0.0	-2.50
31	Left	12329.215	12444.215	12461.778	399592.958	2264844.764	21d 30' 2.4"	100	400		35	133.67	8.547	1.4	7.00
32	Right		12974.112	13027.172	400147.812	2264951.649	3d 2' 21.8"	100	2000		106	53.06	0.704	0.0	-2.50
33	Right		13408.7	13617.625	400731.531	2265040.735	4d 47' 7.5"	100	5000		418	208.93	4.363	0.0	-2.50
34	Right		14501.185	14518.933	401631.002	2265101.929	0d 24' 24.3"	100	5000		35	17.75	0.031	0.0	-2.50
35	Left		15399.155	15471.001	402581.310	2265159.806	1d 38' 47.4"	100	5000		144	71.85	0.516	0.0	-2.50
36	Right		15707.333	15738.048	402847.296	2265183.693	1d 45' 34.9"	100	2000		61	30.72	0.236	0.0	-2.50
37	Left		16122.492	16141.424	403249.978	2265207.420	1d 5' 4.7"	100	2000		38	18.93	0.09	0.0	-2.50
38	Right		16597.077	16641.801	403748.844	2265246.302	5d 7' 17.8"	65	1000		89	44.72	1	0.0	-2.50
39	Right		16795.483	16853.077	403960.166	2265243.849	3d 17' 56.5"	100	2000		115	57.60	0.829	0.0	-2.50
40	Right	17276.444	17326.444	17337.341	404442.991	2265207.517	17d 8' 9.8"	65	240	50	22	61.22	3.147	0.4	7.00
41	Left		17872.928	17977.110	405040.806	2264979.913	14d 50' 21.7"	65	800		207	104.18	6.755	0.0	-2.50
42	Right		18589.053	18640.812	405701.709	2264907.408	7d 24' 12.9"	65	800		103	51.76	1.673	0.0	-2.50
43	Left		19504.113	19518.133	406554.339	2264700.122	0d 48' 11.8"	100	2000		28	14.02	0.049	0.0	-2.50
44	Left	19852.751	19887.751	19903.904	406930.707	2264615.579	10d 42' 31.5"	65	360	35	32	51.25	1.72	0.1	5.22
45	Left		20260.219	20271.167	407297.654	2264600.435	1d 15' 16.2"	65	1000		22	10.95	0.06	0.0	-2.50
46	Right		20805.435	20862.437	407888.853	2264591.171	5d 26' 21.3"	80	1200		114	57.00	1.353	0.0	-2.50
47	Right		21185.83	21241.284	408265.470	2264549.345	5d 17' 30.2"	80	1200		111	55.45	1.281	0.0	-2.50
48	Left	21841.879	21901.879	21904.713	408915.691	2264417.476	10d 27' 4.4"	80	360		6	62.96	1.921	0.4	7.00
49	Left	22357.328	22391.436	22391.436	409402.154	2264410.080	20d 22' 26.1"	80	360	60	68	94.76	6.189	0.4	7.00
50	Right	22786.188	22826.188	22875.909	409862.471	2264561.129	26d 27' 37.6"	65	300	40	99	90.58	8.408	0.2	6.26

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World Bank Project
Chief Engineer
Rhubaneswar, Odisha

PROJECT :-
KALASHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

CLIENT :-
WORKS DEPARTMENT
GOVT. OF ODISHA

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HORIZONTAL CURVE DETAILS (1 OF 2)											
(JAGATPUR TO DUHURIA)											
DRG NO.	OSRP/CEG/JD-49KM/H/01					DESIGNED BY	DRAWN BY	REV (RIS)	APPROVED		
SH. NO.	D	DATE	12/12/12	REV	R-1	CEG	CEG	EE, PMU	CE, WBP		
SCALE	NTS										

HORIZONTAL CURVE DETAILS (JAGTPUR - DUHURIA)

Curve No.	Curve Direction	Transition		HIP Details			Total Deflection	Design	Curve	Transition	Circular	Tangent	Apex	Radial	Super
		Start Chainage	SC	Chainage	Easting	Northing	D	Speed	Radius	Length	Curve Length	Distance	Distance	Shift	Elevation
		TS	SC							Ls (m)	Lc (m)	Ts (m)	Es (m)	S	e (%)
51	Left	23062.874	23102.874	23126.059	410112.145	2264535.991	16d 28' 39.8"	65	300	40	46	63.47	3.358	0.2	6.26
52	Left		23542.748	23581.519	410562.141	2264606.520	0d 53' 18.8"	100	5000		78	38.77	0.15	0.0	-2.50
53	Right	24075.115	24125.115	24146.317	411118.708	2264701.680	22d 2' 2.0"	65	240	50	42	71.80	4.948	0.4	7.00
54	Left	24809.896	24864.896	24884.664	411842.329	2264555.473	13d 32' 12.2"	80	400	55	40	75.01	3.125	0.3	7.00
55	Left		25107.387	25107.387	412111.014	2264560.382	2d 38' 13.5"	100	2000		92	46.03	0.53	0.0	-2.50
56	Right		25980.36	26007.298	412962.568	2264623.546	0d 37' 2.5"	100	5000		54	26.94	0.073	0.0	-2.50
57	Right		26318.45	26395.070	413349.565	2264648.061	4d 23' 16.4"	100	2000		153	76.62	1.467	0.0	-2.50
58	Right		27924.152	27943.173	414897.605	2264627.441	1d 48' 58.2"	80	1200		38	19.02	0.151	0.0	-2.50
59	Right		28149.767	28163.713	415117.924	2264617.515	1d 59' 50.3"	65	800		28	13.95	0.122	0.0	-2.50
60	Left	28292.747	28352.747	28360.371	415314.074	2264604.122	11d 58' 33.1"	80	360	60	15	67.80	2.394	0.4	7.00
61	Right		28768.055	28797.737	415748.029	2264658.157	1d 42' 1.9"	100	2000		59	29.68	0.22	0.0	-2.50
62	Right		29221.809	29251.874	416199.926	2264703.252	1d 22' 40.9"	100	2500		60	30.07	0.181	0.0	-2.50
63	Left	29666.936	29711.936	29721.855	416668.471	2264739.776	7d 25' 46.0"	80	500	45	20	54.97	1.222	0.2	5.69
64	Right	30603.286	30638.286	30669.290	417596.470	2264930.567	7d 56' 12.6"	80	700	35	62	66.07	1.755	0.1	4.06
65	Left		31612.949	31628.493	418553.508	2264995.425	0d 10' 41.2"	100	10000		31	15.54	0.012	0.0	-2.50
66	Left	32634.062	32669.062	32697.629	419619.953	2265071.013	8d 47' 38.3"	80	600	35	57	63.64	1.856	0.1	4.74
67	Left		33171.283	33278.386	420186.597	2265198.396	10d 12' 1.9"	80	1200		214	107.10	4.77	0.0	-2.50
68	Right	33702.786	33792.786	33797.190	420666.880	2265395.138	23d 35' 18.4"	80	240	90	9	95.35	6.611	1.4	7.00
69	Left	34445.644	34505.644	34517.236	421386.508	2265396.632	13d 14' 17.4"	80	360	60	23	71.82	2.835	0.4	7.00
70	Right		34999.476	35019.262	421876.878	2265503.867	0d 54' 24.7"	100	2500		40	19.79	0.078	0.0	-2.50
71	Left		35316.97	35368.491	422218.817	2265574.858	2d 21' 40.5"	100	2500		103	51.52	0.531	0.0	-2.50
72	Right	35742.836	35797.836	35805.150	422642.741	2265679.444	9d 58' 23.6"	80	400	55	15	62.42	1.836	0.3	7.00
73	Right		36736.124	36776.013	423610.930	2265750.896	5d 42' 32.4"	65	800		80	39.89	0.994	0.0	-2.50
74	Right		36912.392	36932.957	423767.879	2265746.534	2d 56' 42.0"	65	800		41	20.56	0.264	0.0	-2.50
75	Right	37737.406	37787.406	37814.307	424646.190	2265674.104	14d 51' 25.5"	80	400	50	54	77.18	3.648	0.3	7.00
76	Left	37953.996	38023.996	38031.949	424854.086	2265610.602	28d 56' 57.9"	65	170	70	16	79.15	6.812	1.2	7.00
77	Right		38898.523	38929.661	425739.962	2265753.216	0d 42' 49.0"	100	5000		62	31.14	0.097	0.0	-2.50
78	Right		39622.361	39643.721	426445.538	2265862.968	0d 29' 22.4"	100	5000		43	21.36	0.046	0.0	-2.50
79	Right		40336.286	40358.177	427152.417	2265966.745	0d 15' 3.1"	100	10000		44	21.89	0.024	0.0	-2.50
80	Left		40695.886	40783.182	427573.181	2266026.636	4d 59' 54.6"	100	2000		174	87.30	1.904	0.0	-2.50
81	Left	41433.657	41493.657	41503.132	428273.876	2266192.207	12d 33' 53.5"	80	360	60	19	69.67	2.594	0.4	7.00
82	Left	42230.605	42265.605	42288.324	428982.160	2266530.929	7d 40' 45.4"	80	600	35	45	57.77	1.435	0.1	4.74
83	Right		42729.783	42746.517	429365.488	2266781.947	0d 11' 30.3"	100	10000		33	16.73	0.014	0.0	-2.50
84	Right	43302.697	43352.697	43367.326	429886.912	2267118.644	18d 54' 45.4"	65	240	50	29	65.04	3.746	0.4	7.00
85	Left	44378.538	44413.538	44426.518	430912.349	2267383.463	9d 42' 1.0"	65	360	35	26	48.06	1.436	0.1	5.22
86	Right	44984.059	45044.059	45050.858	431484.300	2267633.638	11d 42' 47.7"	80	360	60	14	66.96	2.308	0.4	7.00
87	Left	47415.121	47475.121	47502.734	433879.056	2268158.896	18d 19' 18.4"	80	360	60	55	88.12	5.073	0.4	7.00
88	Right	48335.059	48405.059	48409.818	434664.815	2268611.339	26d 47' 57.8"	65	170	70	10	75.74	5.99	1.2	7.00
89	Right		48673.724	48692.871	434946.492	2268635.570	0d 26' 19.7"	100	5000		38	19.15	0.037	0.0	-2.50

VALECHA ENGINEERING LTD. CONSULTANT



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Checked by: Shubaneswar, E.I.C.(Civil), Odisha

PROJECT: STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE

CLIENT :-
WORKS DEPARTMENT
GOVT. OF ODISHA

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HORIZONTAL CURVE DETAILS (2 OF 2)									
(JAGATPUR TO DUHURIA)									
DRG NO.	OSRP/CEG/JD-49KM/HC-02				DESIGNED BY	DRAWN BY	REV. (R-I)	APPROVED	
SH. NO.	I	DATE	12/12/12	REV	R-1	CEG		CEG	EE, PMU
SCALE	NTS					CEG		CEG	CF, WBP

VERTICAL CURVE DETAILS (JAGTPUR - DUHURIA)

VALECHA ENGINEERING LTD
Contractor



Curve No.	Curve Type	VIP Detail		Curve Length	'K' Value	Curve Start		Curve End		Start gradient	End Gradient	Grade Difference
		Chainage	Level			Chainage	Level	Chainage	Level			
1	Sag	0+143.020	26.772	200	208.804	0+043.020	27.73	0+243.020	26.772	-0.958	0	-0.958
2	Sag	0+443.840	26.772	200	1138.829	0+343.840	26.772	0+543.840	26.948	0	0.176	-0.176
3	Hog	0+769.545	27.344	200	316.435	0+669.545	27.168	0+869.545	26.888	0.176	-0.456	0.632
4	Sag	1+146.389	25.624	300	747.217	0+996.389	26.309	1+296.389	25.542	-0.456	-0.055	-0.401
5	Sag	1+859.992	25.232	130	45.22	1+794.992	25.268	1+924.992	27.065	-0.055	2.82	-2.875
6	Hog	2+017.160	29.664	60	21.277	1+987.160	28.818	2+047.160	29.664	2.82	0	2.82
7	Hog	2+144.447	29.664	70	20.48	2+109.447	29.664	2+179.447	28.468	0	-3.418	3.418
8	Sag	2+283.416	24.914	150	43.878	2+208.416	27.478	2+358.416	24.914	-3.418	0.001	-3.419
9	Hog	4+010.199	24.747	200	939.212	3+910.199	24.762	4+110.199	24.52	-0.015	-0.227	0.212
10	Sag	4+373.760	23.92	300	1056.537	4+223.760	24.261	4+523.760	24.005	-0.227	0.056	-0.283
11	Hog	4+862.478	24.196	400	8133.709	4+662.478	24.083	5+062.478	24.211	0.056	0.007	0.049
12	Hog	5+424.412	24.237	150	2820.159	5+349.412	24.232	5+499.412	24.203	0.007	-0.046	0.053
13	Sag	7+949.892	23.078	150	340.863	7+874.892	23.112	8+024.892	23.374	-0.046	0.394	-0.44
14	Hog	8+343.634	24.63	200	571.323	8+243.634	24.236	8+443.634	24.674	0.394	0.044	0.35
15	Hog	8+935.441	24.891	150	268.635	8+860.441	24.858	9+010.441	24.505	0.044	-0.514	0.558
16	Sag	9+256.669	23.239	200	616.838	9+156.669	23.753	9+356.669	23.049	-0.514	-0.19	-0.324
17	Sag	9+862.850	22.087	300	2460.319	9+712.850	22.372	10+012.850	21.985	-0.19	-0.068	-0.122
18	Sag	10+416.392	21.71	150	2202.422	10+341.392	21.761	10+491.392	21.71	-0.068	0	-0.068
19	Sag	10+585.031	21.71	60	606.176	10+555.031	21.71	10+615.031	21.74	0	0.099	-0.099
20	Hog	11+269.000	22.387	300	1977.587	11+119.000	22.239	11+419.000	22.308	0.099	-0.053	0.152
21	Hog	13+399.163	21.264	200	440.243	13+299.163	21.317	13+499.163	20.757	-0.053	-0.507	0.454
22	Sag	13+785.346	19.306	200	300.576	13+685.346	19.813	13+885.346	19.464	-0.507	0.158	-0.665
23	Hog	14+299.314	20.12	200	1858.752	14+199.314	19.962	14+399.314	20.171	0.158	0.051	0.107
24	Hog	15+215.091	20.585	150	312.942	15+140.091	20.547	15+290.091	20.264	0.051	-0.429	0.48
25	Sag	15+762.290	18.24	100	233.347	15+712.290	18.454	15+812.290	18.24	-0.429	0	-0.429
26	Sag	15+975.454	18.24	100	201.537	15+925.454	18.24	16+025.454	18.488	0	0.496	-0.496
27	Hog	16+133.862	19.026	150	295.714	16+058.862	18.654	16+208.862	19.018	0.496	-0.011	0.507
28	Sag	16+414.161	18.995	150	1127.947	16+339.161	19.003	16+489.161	19.086	-0.011	0.122	-0.133
29	Hog	16+739.770	19.392	150	750.371	16+664.770	19.301	16+814.770	19.334	0.122	-0.078	0.2
30	Sag	17+864.480	18.515	200	2817.793	17+764.480	18.593	17+964.480	18.508	-0.078	-0.007	-0.071
31	Hog	18+164.560	18.494	60	292.524	18+134.560	18.496	18+194.560	18.43	-0.007	-0.212	0.205
32	Sag	18+469.120	17.848	60	220.142	18+439.120	17.912	18+499.120	17.866	-0.212	0.06	-0.272
33	Hog	18+854.610	18.081	200	554.976	18+754.610	18.021	18+954.610	17.781	0.06	-0.3	0.36
34	Sag	19+379.727	16.506	100	59.565	19+329.727	16.656	19+429.727	17.195	-0.3	1.379	-1.679
35	Hog	19+638.800	20.078	280	157.779	19+498.800	18.148	19+778.800	19.524	1.379	-0.396	1.775

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

Chief Engineer
Works Department
Govt. of Odisha

PROJECT :-
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

CLIENT :-
WORKS DEPARTMENT
GOVT. OF ODISHA

CEG CONSULTING ENGINEERS GROUP LTD.
E-12, Moji Colony, Malviya Nagar Jaipur-17
Tel: +91-141-2520899, 2521899, 2520556
Fax: 2521348, e-mail: ceg@ceginia.com

VERTICAL CURVE DETAILS (1 OF 3)

(JAGATPUR TO DUHURIA)

DRG NO.	OSRP:CEG/JD-49KM/VC/01					DESIGNED BY	DRAWN BY	REV. (R)	APPROVED
SH. NO.	H	DATE	12/12/12	REV	R-1	CEG	CEG	FE, PMU	CE, WBP
SCALE	NTS								

VERTICAL CURVE DETAILS (JAGTPUR - DUHURIA)

Curve No.	Curve Type	VIP Detail		Curve Length	'K' Value	Curve Start		Curve End		Start Gradient	End Gradient	Grade Difference
		Chainage	Level			Chainage	Level	Chainage	Level			
36	Sag	20+437.200	16.919	200	431.745	20+337.200	17.315	20+537.200	16.987	-0.396	0.068	-0.464
37	Sag	21+112.571	17.375	150	638.442	21+037.571	17.324	21+187.571	17.602	0.068	0.302	-0.234
38	Hog	21+484.514	18.5	500	1102.659	21+234.514	17.744	21+734.514	18.123	0.302	-0.151	0.453
39	Sag	22+070.671	17.615	300	1333.001	21+920.671	17.841	22+220.671	17.726	-0.151	0.074	-0.225
40	Hog	22+832.085	18.179	500	2897.055	22+582.085	17.994	23+082.085	17.933	0.074	-0.099	0.173
41	Sag	24+563.120	16.474	200	522.187	24+463.120	16.572	24+663.120	16.758	-0.099	0.284	-0.383
42	Hog	24+857.808	17.312	300	918.812	24+707.808	16.885	25+007.808	17.249	0.284	-0.042	0.326
43	Hog	26+266.637	16.72	200	462.581	26+166.637	16.762	26+366.637	16.246	-0.042	-0.474	0.432
44	Sag	26+608.137	15.1	200	433.97	26+508.137	15.574	26+708.137	15.086	-0.474	-0.014	-0.46
45	Sag	27+453.760	14.986	200	617.648	27+353.760	14.999	27+553.760	15.296	-0.014	0.31	-0.324
46	Hog	28+066.826	16.888	250	413.388	27+941.826	16.5	28+191.826	16.52	0.31	-0.294	0.604
47	Sag	28+496.757	15.622	150	188.763	28+421.757	15.843	28+571.757	15.997	-0.294	0.5	-0.794
48	Hog	28+757.263	16.925	150	327.189	28+682.263	16.55	28+832.263	16.956	0.5	0.042	0.458
49	Hog	29+308.426	17.155	200	378.647	29+208.426	17.113	29+408.426	16.669	0.042	-0.486	0.528
50	Sag	29+699.203	15.254	200	386.385	29+599.203	15.74	29+799.203	15.285	-0.486	0.031	-0.517
51	Hog	30+071.581	15.37	150	3037.668	29+996.581	15.347	30+146.581	15.356	0.031	-0.018	0.049
52	Hog	30+620.162	15.27	400	4570.529	30+420.162	15.306	30+820.162	15.059	-0.018	-0.106	0.088
53	Sag	31+886.403	13.931	200	1891.323	31+786.403	14.037	31+986.403	13.931	-0.106	0	-0.106
54	Sag	32+226.178	13.931	200	2905.945	32+126.178	13.931	32+326.178	14	0	0.069	-0.069
55	Hog	33+904.361	15.086	500	2891.223	33+654.361	14.914	34+154.361	14.826	0.069	-0.104	0.173
56	Hog	34+777.453	14.177	150	929.964	34+702.453	14.255	34+852.453	13.978	-0.104	-0.265	0.161
57	Sag	35+281.580	12.839	150	391.383	35+206.580	13.038	35+356.580	12.927	-0.265	0.118	-0.383
58	Hog	35+886.600	13.552	200	1847.652	35+786.600	13.434	35+986.600	13.562	0.118	0.01	0.108
59	Hog	37+063.458	13.665	250	1488.891	36+938.458	13.653	37+188.458	13.467	0.01	-0.158	0.168
60	Hog	37+912.434	12.321	100	881.103	37+862.434	12.4	37+962.434	12.185	-0.158	-0.272	0.114
61	Sag	38+079.835	11.866	150	495.195	38+004.835	12.07	38+154.835	11.889	-0.272	0.031	-0.303
62	Hog	38+963.845	12.141	250	795.063	38+838.845	12.102	39+088.845	11.787	0.031	-0.283	0.314
63	Sag	39+524.318	10.553	300	533.306	39+374.318	10.978	39+674.318	10.972	-0.283	0.279	-0.562
64	Hog	39+849.895	11.462	150	631.228	39+774.895	11.253	39+924.895	11.493	0.279	0.042	0.237
65	Hog	40+614.970	11.78	200	1012.828	40+514.970	11.738	40+714.970	11.624	0.042	-0.156	0.198
66	Sag	41+185.840	10.89	200	1426.329	41+085.840	11.046	41+285.840	10.874	-0.156	-0.016	-0.14
67	Sag	42+378.267	10.703	200	582.826	42+278.267	10.719	42+478.267	11.03	-0.016	0.327	-0.343
68	Hog	42+887.011	12.369	600	738.331	42+587.011	11.387	43+187.011	10.913	0.327	-0.485	0.812
69	Sag	43+417.340	9.796	250	249.794	43+292.340	10.402	43+542.340	10.441	-0.485	0.516	-1.001
70	Hog	43+672.162	11.11	100	124.261	43+622.162	10.852	43+722.162	10.965	0.516	-0.289	0.805

VALECHA ENGINEERING LTD.
Contractor



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Work Order No. 123456
Muzila, Bhubaneswar
O/o the E.I.C. (Civil), Odisha
Bhubaneswar.

PROJECT :-
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

CLIENT :-
WORKS DEPARTMENT
GOVT. OF ODISHA

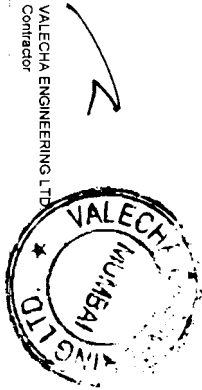
CEG CONSULTING ENGINEERS GROUP LTD.
E-12, Moji Colony, Malviya Nagar Jaipur-17
Tel: +91-141-2520899, 2521899, 2520556
Fax: 2521348, e-mail: ceg@ceginidia.com

VERTICAL CURVE DETAILS (2 OF 3)
(JAGATPUR TO DUHURIA)

DRG. NO.	OSRP CEG.JD-49KM/VC-02					DESIGNED BY	DRAWN BY	REV. (R1)	APPROVED
SIL. NO.	H	DATE	12/12/12	REV	R-1	CEG	CEG	EE, PMU	CE, WBP
SCALE	NTS								

VERTICAL CURVE DETAILS (JAGTPUR - DUHURIA)

Curve No.	Curve Type	VIP Detail		Curve Length	'K' Value	Curve Start		Curve End		Start Gradient	End Gradient	Grade Difference
		Chainage	Level			Chainage	Level	Chainage	Level			
71	Sag	43+853.756	10.585	150	438.27	43+778.756	10.802	43+928.756	10.625	-0.289	0.053	-0.342
72	Hog	44+216.891	10.778	200	1539.921	44+116.891	10.725	44+316.891	10.701	0.053	-0.077	0.13
73	Sag	45+030.148	10.154	150	432.042	44+955.148	10.212	45+105.148	10.357	-0.077	0.27	-0.347
74	Hog	45+474.206	11.355	300	624.204	45+324.206	10.949	45+624.206	11.04	0.27	-0.21	0.48
75	Sag	46+018.574	10.211	600	1501.527	45+718.574	10.841	46+318.574	10.779	-0.21	0.189	-0.399
76	Hog	46+418.170	10.968	150	878.531	46+343.170	10.826	46+493.170	10.982	0.189	0.019	0.17
77	Hog	47+166.763	11.108	150	430.925	47+091.763	11.094	47+241.763	10.861	0.019	-0.329	0.348
78	Sag	47+459.732	10.143	150	614.722	47+384.732	10.39	47+534.732	10.079	-0.329	-0.085	-0.244
79	Sag	47+997.368	9.684	200	1095.209	47+897.368	9.769	48+097.368	9.781	-0.085	0.097	-0.182
80	Hog	48+352.161	10.029	150	490.069	48+277.161	9.956	48+427.161	9.872	0.097	-0.209	0.306
81	Sag	48+694.529	9.314	150	308.851	48+619.529	9.471	48+769.529	9.522	-0.209	0.277	-0.486



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PROJECT :-
VALECHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

CLIENT :-
WORKS DEPARTMENT
GOVT. OF ODISHA

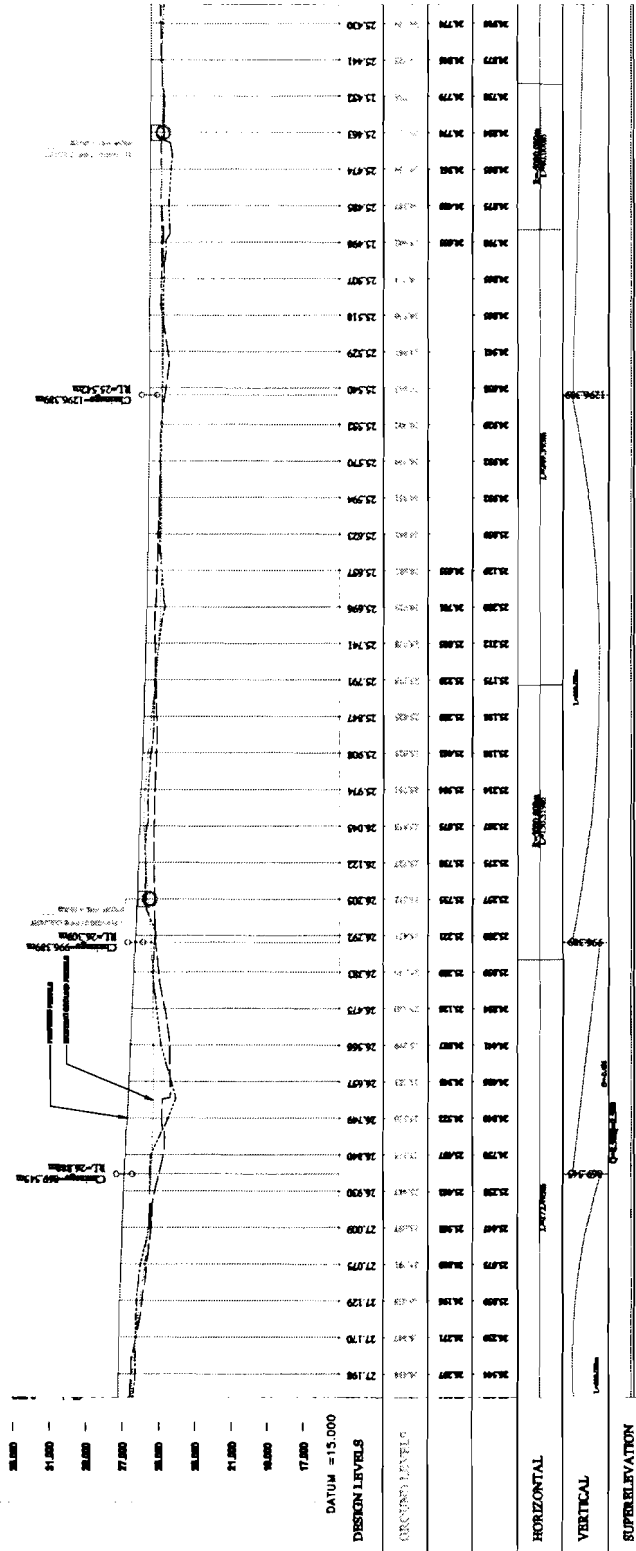
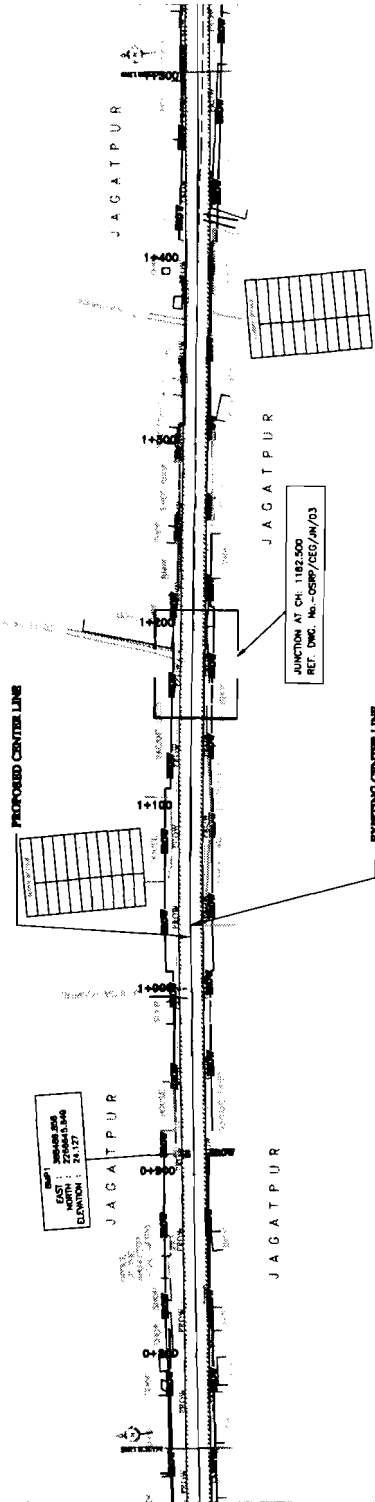
CEG CONSULTING ENGINEERS GROUP LTD.
E-12, Maji Colony, Malviya Nagar Jaipur-17
Tel: +91-141-2520899, 2521899, 2520556
Fax: 2521348, e-mail: ceg@cegindia.com

VERTICAL CURVE DETAILS (3 OF 3)										
JAGATPUR TO DUHURIA										
DRG NO.	OSRP/CEG/JD-49KM/VC-03					DESIGNED BY	DRAWN BY	REV (RD)	APPROVED	
SHEET NO.	II	DATE:	12-12-12	REV	R-1	CEG		CEG	FE, PMU	CE, WBP
SCALE	NTS									

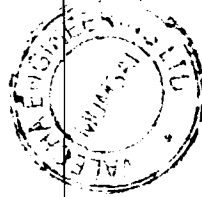
Civil Engineer
Bhubaneswar

TO CHANDBALI →

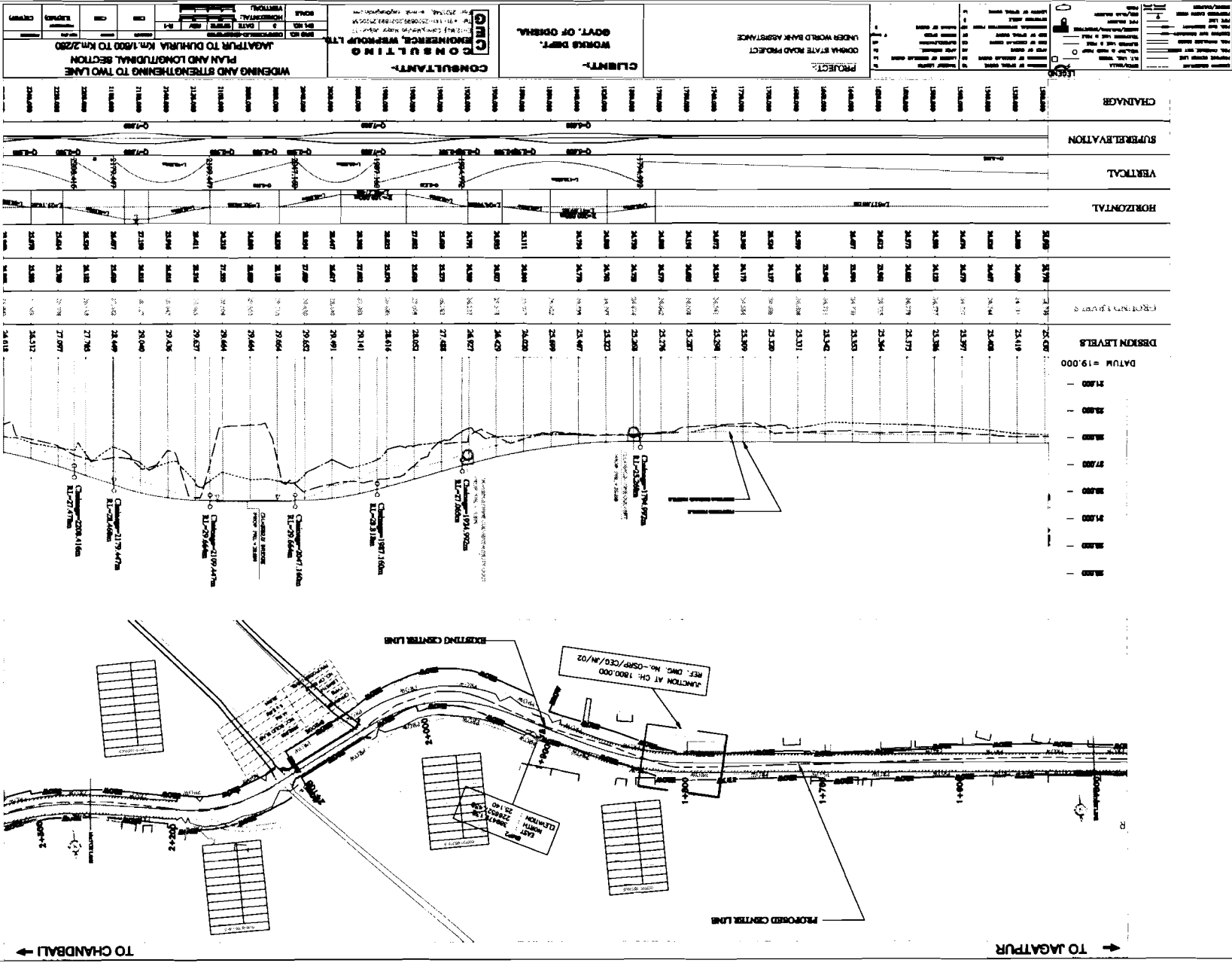
← TO JAGATPUR



CHAINAGE	FINISHED LEVEL	GROUND LEVEL	VERTICAL CURVE DATA
77.190	17.54	16.97	
77.170	16.71	16.14	
77.150	16.18	15.61	
77.130	15.87	15.30	
77.110	15.68	15.11	
77.090	15.59	15.02	
77.070	15.51	14.94	
77.050	15.43	14.86	
77.030	15.35	14.78	
77.010	15.27	14.70	
76.990	15.19	14.62	
76.970	15.11	14.54	
76.950	15.03	14.46	
76.930	14.95	14.38	
76.910	14.87	14.30	
76.890	14.79	14.22	
76.870	14.71	14.14	
76.850	14.63	14.06	
76.830	14.55	13.98	
76.810	14.47	13.90	
76.790	14.39	13.82	
76.770	14.31	13.74	
76.750	14.23	13.66	
76.730	14.15	13.58	
76.710	14.07	13.50	
76.690	13.99	13.42	
76.670	13.91	13.34	
76.650	13.83	13.26	
76.630	13.75	13.18	
76.610	13.67	13.10	
76.590	13.59	13.02	
76.570	13.51	12.94	
76.550	13.43	12.86	
76.530	13.35	12.78	
76.510	13.27	12.70	
76.490	13.19	12.62	
76.470	13.11	12.54	
76.450	13.03	12.46	
76.430	12.95	12.38	
76.410	12.87	12.30	
76.390	12.79	12.22	
76.370	12.71	12.14	
76.350	12.63	12.06	
76.330	12.55	11.98	
76.310	12.47	11.90	
76.290	12.39	11.82	
76.270	12.31	11.74	
76.250	12.23	11.66	
76.230	12.15	11.58	
76.210	12.07	11.50	
76.190	11.99	11.42	
76.170	11.91	11.34	
76.150	11.83	11.26	
76.130	11.75	11.18	
76.110	11.67	11.10	
76.090	11.59	11.02	
76.070	11.51	10.94	
76.050	11.43	10.86	
76.030	11.35	10.78	
76.010	11.27	10.70	
75.990	11.19	10.62	
75.970	11.11	10.54	
75.950	11.03	10.46	
75.930	10.95	10.38	
75.910	10.87	10.30	
75.890	10.79	10.22	
75.870	10.71	10.14	
75.850	10.63	10.06	
75.830	10.55	9.98	
75.810	10.47	9.90	
75.790	10.39	9.82	
75.770	10.31	9.74	
75.750	10.23	9.66	
75.730	10.15	9.58	
75.710	10.07	9.50	
75.690	9.99	9.42	
75.670	9.91	9.34	
75.650	9.83	9.26	
75.630	9.75	9.18	
75.610	9.67	9.10	
75.590	9.59	9.02	
75.570	9.51	8.94	
75.550	9.43	8.86	
75.530	9.35	8.78	
75.510	9.27	8.70	
75.490	9.19	8.62	
75.470	9.11	8.54	
75.450	9.03	8.46	
75.430	8.95	8.38	
75.410	8.87	8.30	
75.390	8.79	8.22	
75.370	8.71	8.14	
75.350	8.63	8.06	
75.330	8.55	7.98	
75.310	8.47	7.90	
75.290	8.39	7.82	
75.270	8.31	7.74	
75.250	8.23	7.66	
75.230	8.15	7.58	
75.210	8.07	7.50	
75.190	7.99	7.42	
75.170	7.91	7.34	
75.150	7.83	7.26	
75.130	7.75	7.18	
75.110	7.67	7.10	
75.090	7.59	7.02	
75.070	7.51	6.94	
75.050	7.43	6.86	
75.030	7.35	6.78	
75.010	7.27	6.70	
74.990	7.19	6.62	
74.970	7.11	6.54	
74.950	7.03	6.46	
74.930	6.95	6.38	
74.910	6.87	6.30	
74.890	6.79	6.22	
74.870	6.71	6.14	
74.850	6.63	6.06	
74.830	6.55	5.98	
74.810	6.47	5.90	
74.790	6.39	5.82	
74.770	6.31	5.74	
74.750	6.23	5.66	
74.730	6.15	5.58	
74.710	6.07	5.50	
74.690	5.99	5.42	
74.670	5.91	5.34	
74.650	5.83	5.26	
74.630	5.75	5.18	
74.610	5.67	5.10	
74.590	5.59	5.02	
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74.530	5.35	4.78	
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74.490	5.19	4.62	
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74.450	5.03	4.46	
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74.410	4.87	4.30	
74.390	4.79	4.22	
74.370	4.71	4.14	
74.350	4.63	4.06	
74.330	4.55	3.98	
74.310	4.47	3.90	
74.290	4.39	3.82	
74.270	4.31	3.74	
74.250	4.23	3.66	
74.230	4.15	3.58	
74.210	4.07	3.50	
74.190	3.99	3.42	
74.170	3.91	3.34	
74.150	3.83	3.26	
74.130	3.75	3.18	
74.110	3.67	3.10	
74.090	3.59	3.02	
74.070	3.51	2.94	
74.050	3.43	2.86	
74.030	3.35	2.78	
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73.970	3.11	2.54	
73.950	3.03	2.46	
73.930	2.95	2.38	
73.910	2.87	2.30	
73.890	2.79	2.22	
73.870	2.71	2.14	
73.850	2.63	2.06	
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73.810	2.47	1.90	
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73.730	2.15	1.58	
73.710	2.07	1.50	
73.690	1.99	1.42	
73.670	1.91	1.34	
73.650	1.83	1.26	
73.630	1.75	1.18	
73.610	1.67	1.10	
73.590	1.59	1.02	
73.570	1.51	0.94	
73.550	1.43	0.86	
73.530	1.35	0.78	
73.510	1.27	0.70	
73.490	1.19	0.62	
73.470	1.11	0.54	
73.450	1.03	0.46	
73.430	0.95	0.38	
73.410	0.87	0.30	
73.390	0.79	0.22	
73.370	0.71	0.14	
73.350	0.63	0.06	
73.330	0.55	-0.02	
73.310	0.47	-0.10	
73.290	0.39	-0.18	
73.270	0.31	-0.26	
73.250	0.23	-0.34	
73.230	0.15	-0.42	
73.210	0.07	-0.50	
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73.170	-0.09	-0.66	
73.150	-0.17	-0.74	
73.130	-0.25	-0.82	
73.110	-0.33	-0.90	
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72.990	-0.81	-1.38	
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72.910	-1.13	-1.70	
72.890	-1.21	-1.78	
72.870	-1.29	-1.86	
72.850	-1.37	-1.94	
72.830	-1.45	-2.02	
72.810	-1.53	-2.10	
72.790	-1.61	-2.18	
72.770	-1.69	-2.26	
72.750	-1.77	-2.34	
72.730	-1.85	-2.42	
72.710	-1.93	-2.50	
72.690	-2.01	-2.58	
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72.650	-2.17	-2.74	
72.630	-2.25	-2.82	
72.610	-2.33	-2.90	
72.590	-2.41	-2.98	
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72.550	-2.57	-3.14	
72.530	-2.65	-3.22	
72.510	-2.73	-3.30	
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72.470	-2.89	-3.46	
72.450	-2.97	-3.54	
72.430	-3.05	-3.62	
72.410	-3.13	-3.70	
72.390	-3.21	-3.78	
72.370	-3.29	-3.86	
72.350	-3.37	-3.94	
72.330	-3.45	-4.02	
72.310	-3.53	-4.10	
72.290	-3.61	-4.18	
72.270	-3.69	-4.26	
72.250	-3.77	-4.34	
72.230	-3.85	-4.42	
72.210	-3.93	-4.50	
72.190	-4.01	-4.58	
72.170	-4.09	-4.66	
72.150	-4.17	-4.74	
72.130	-4.25	-4.82	
72.110	-4.33	-4.90	
72.090	-4.41	-4.98	
72.070	-4.49	-5.06	
72.050	-4.57	-5.14	
72.030	-4.65	-5.22	
72.010	-4.73	-5.30	
71.990	-4.81	-5.38	
71.970	-4.89	-5.46	
71.950	-4.97	-5.54	
71.930	-5.05	-5.62	
71.910	-5.13	-5.70	
71.890	-5.21	-5.78	
71.870	-5.29	-5.86	
71.850	-5.37	-5.94	
71.830	-5.45	-6.02	
71.810	-5.53	-6.10	
71.790	-5.61	-6.18	
71.770	-5.69	-6.26	
71.750	-5.77	-6.34	
71.730	-5.85	-6.42	
71.710	-5.93	-6.50	
71.690	-6.01	-6.58	
71.670	-6.09	-6.66	
71.650	-6.17	-6.74	
71.630	-6.25	-6.82	
71.610	-6.33	-6.90	
71.590	-6.41	-6.98	
71.570	-6.49	-7.06	
71.550	-6.57	-7.14	
71.530	-6.65	-7.22	
71.510	-6.73	-7.30	
71.490	-6.81	-7.38	
71.470	-6.89	-7.46	
71.450	-6.97	-7.54	
71.430	-7.05	-7.62	
71.410	-7.13	-7.70	
71.390	-7.21	-7.78	
71.370	-7.29	-7.86	
71.350	-7.37	-7.94	
71.330	-7.45	-8.02	
71.310	-7.53	-8.10	
71.290	-7.61	-8.18	
71.270	-7.69	-8.26	
71.250	-7.77	-8.34	
71.230	-7.85	-8.42	
71.210	-7.93	-8.50	
71.190	-8.01	-8.58	
71.170	-8.09	-8.66	
71.150	-8.17	-8.74	
71.130	-8.25	-8.82	
71.110	-8.33	-8.90	
71.090	-8.41	-8.98	



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



TO CHANDBALI ←

TO JAGATPUR →

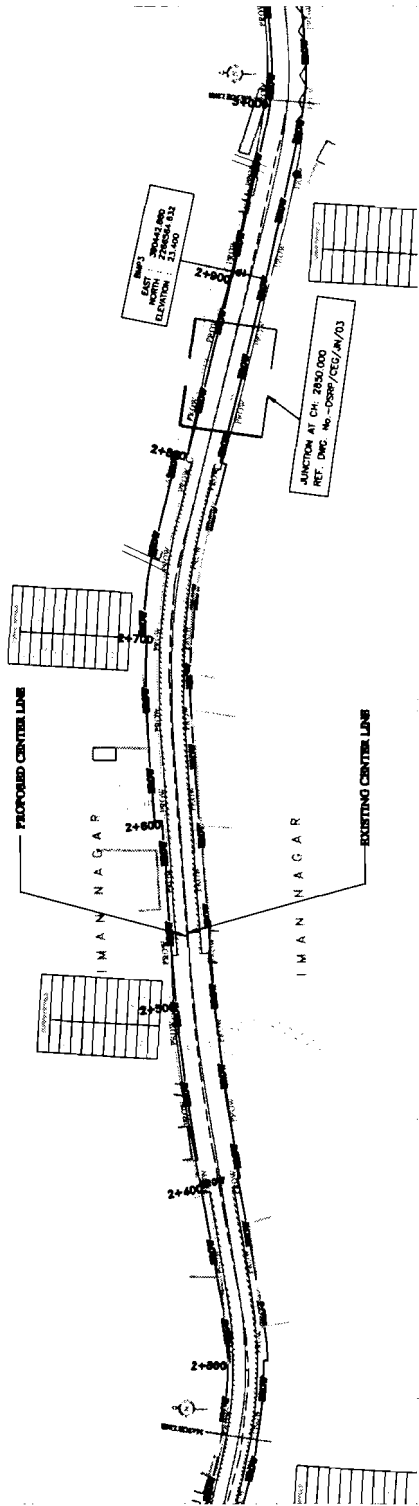
JUNCTION AT CH. 1800.000
REF. DWG. No. - DSM/CE/M/02

EXIST. CENTER LINE
PROPOSED CENTER LINE

PROJECT: ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE
CLIENT: WORKS DEPT. GOVT. OF ODISHA
CONSULTANT: VALECHA ENGINEERING LTD.
WIDENING AND STRENGTHENING TO TWO LANE PLAN AND LONGITUDINAL SECTION JAGATPUR TO DUNDURA Km. 1/800 TO Km. 2/250

TO CHANDBALI →

← TO JAGATPUR



CHAINAGE	GROUND LEVEL	DESIGN LEVELS	HORIZONTAL	VERTICAL	SUPERELEVATION
2+018	24.80	24.80	0+000	0+000	0+000
2+019	24.80	24.80	0+000	0+000	0+000
2+020	24.80	24.80	0+000	0+000	0+000
2+021	24.80	24.80	0+000	0+000	0+000
2+022	24.80	24.80	0+000	0+000	0+000
2+023	24.80	24.80	0+000	0+000	0+000
2+024	24.80	24.80	0+000	0+000	0+000
2+025	24.80	24.80	0+000	0+000	0+000
2+026	24.80	24.80	0+000	0+000	0+000
2+027	24.80	24.80	0+000	0+000	0+000
2+028	24.80	24.80	0+000	0+000	0+000
2+029	24.80	24.80	0+000	0+000	0+000
2+030	24.80	24.80	0+000	0+000	0+000
2+031	24.80	24.80	0+000	0+000	0+000
2+032	24.80	24.80	0+000	0+000	0+000
2+033	24.80	24.80	0+000	0+000	0+000
2+034	24.80	24.80	0+000	0+000	0+000
2+035	24.80	24.80	0+000	0+000	0+000
2+036	24.80	24.80	0+000	0+000	0+000
2+037	24.80	24.80	0+000	0+000	0+000
2+038	24.80	24.80	0+000	0+000	0+000
2+039	24.80	24.80	0+000	0+000	0+000
2+040	24.80	24.80	0+000	0+000	0+000
2+041	24.80	24.80	0+000	0+000	0+000
2+042	24.80	24.80	0+000	0+000	0+000
2+043	24.80	24.80	0+000	0+000	0+000
2+044	24.80	24.80	0+000	0+000	0+000
2+045	24.80	24.80	0+000	0+000	0+000
2+046	24.80	24.80	0+000	0+000	0+000
2+047	24.80	24.80	0+000	0+000	0+000
2+048	24.80	24.80	0+000	0+000	0+000
2+049	24.80	24.80	0+000	0+000	0+000
2+050	24.80	24.80	0+000	0+000	0+000
2+051	24.80	24.80	0+000	0+000	0+000
2+052	24.80	24.80	0+000	0+000	0+000
2+053	24.80	24.80	0+000	0+000	0+000
2+054	24.80	24.80	0+000	0+000	0+000
2+055	24.80	24.80	0+000	0+000	0+000
2+056	24.80	24.80	0+000	0+000	0+000
2+057	24.80	24.80	0+000	0+000	0+000
2+058	24.80	24.80	0+000	0+000	0+000
2+059	24.80	24.80	0+000	0+000	0+000
2+060	24.80	24.80	0+000	0+000	0+000
2+061	24.80	24.80	0+000	0+000	0+000
2+062	24.80	24.80	0+000	0+000	0+000
2+063	24.80	24.80	0+000	0+000	0+000
2+064	24.80	24.80	0+000	0+000	0+000
2+065	24.80	24.80	0+000	0+000	0+000
2+066	24.80	24.80	0+000	0+000	0+000
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2+071	24.80	24.80	0+000	0+000	0+000
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2+085	24.80	24.80	0+000	0+000	0+000
2+086	24.80	24.80	0+000	0+000	0+000
2+087	24.80	24.80	0+000	0+000	0+000
2+088	24.80	24.80	0+000	0+000	0+000
2+089	24.80	24.80	0+000	0+000	0+000
2+090	24.80	24.80	0+000	0+000	0+000
2+091	24.80	24.80	0+000	0+000	0+000
2+092	24.80	24.80	0+000	0+000	0+000
2+093	24.80	24.80	0+000	0+000	0+000
2+094	24.80	24.80	0+000	0+000	0+000
2+095	24.80	24.80	0+000	0+000	0+000
2+096	24.80	24.80	0+000	0+000	0+000
2+097	24.80	24.80	0+000	0+000	0+000
2+098	24.80	24.80	0+000	0+000	0+000
2+099	24.80	24.80	0+000	0+000	0+000
2+100	24.80	24.80	0+000	0+000	0+000

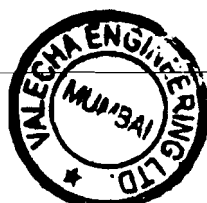
CONSULTANT:
CE ENGINEERING WORKS LTD.
 13/11, Laxmi Vihar, New Delhi-110016
 Tel: 431-241-2000/431-241-2415
 Fax: 431-241-2000/431-241-2415
 E-mail: ce@ce-engineering.com

CLIENT:
WORKS DEPT.
GOVT. OF ODISHA.

PROJECT:
 ODISHA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE

**WIDENING AND STRENGTHENING TO TWO LANE
 PLAN AND LONGITUDINAL SECTION
 JAGATPUR TO DURJIA Km.2280 TO Km.3000**

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

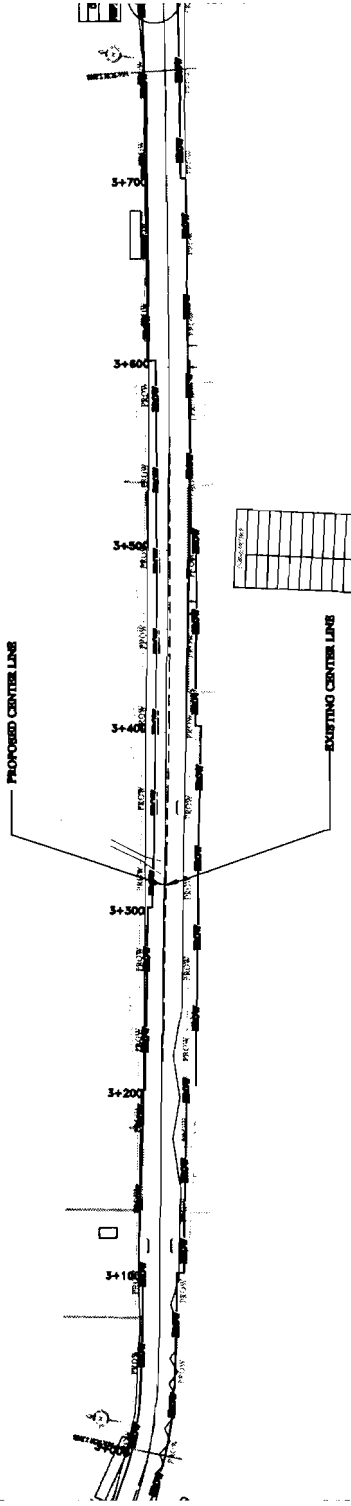


VALECHA ENGINEERING LTD
 Contractor

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

TO CHANBALI →

← TO JAGAITPUR



CHAINAGE	EXISTING LEVEL	PROPOSED LEVEL	GRADIENT (%)
26.800			
26.850			
26.900			
26.950			
27.000			
27.050			
27.100			
27.150			
27.200			
27.250			
27.300			
27.350			
27.400			
27.450			
27.500			
27.550			
27.600			
27.650			
27.700			
27.750			
27.800			
27.850			
27.900			
27.950			
28.000			
28.050			
28.100			
28.150			
28.200			
28.250			
28.300			
28.350			
28.400			
28.450			
28.500			
28.550			
28.600			
28.650			
28.700			
28.750			
28.800			
28.850			
28.900			
28.950			
29.000			
29.050			
29.100			
29.150			
29.200			
29.250			
29.300			
29.350			
29.400			
29.450			
29.500			
29.550			
29.600			
29.650			
29.700			
29.750			
29.800			
29.850			
29.900			
29.950			
30.000			

CHAINAGE	EXISTING LEVEL	PROPOSED LEVEL	GRADIENT (%)
30.050			
30.100			
30.150			
30.200			
30.250			
30.300			
30.350			
30.400			
30.450			
30.500			
30.550			
30.600			
30.650			
30.700			
30.750			
30.800			
30.850			
30.900			
30.950			
31.000			
31.050			
31.100			
31.150			
31.200			
31.250			
31.300			
31.350			
31.400			
31.450			
31.500			
31.550			
31.600			
31.650			
31.700			
31.750			
31.800			
31.850			
31.900			
31.950			
32.000			

CHAINAGE	EXISTING LEVEL	PROPOSED LEVEL	GRADIENT (%)
32.050			
32.100			
32.150			
32.200			
32.250			
32.300			
32.350			
32.400			
32.450			
32.500			
32.550			
32.600			
32.650			
32.700			
32.750			
32.800			
32.850			
32.900			
32.950			
33.000			

PROJECT:
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

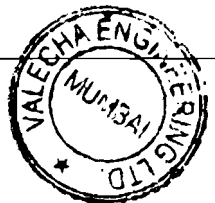
CLIENT:
WORKS DEPT.
GOVT. OF ODISHA

CONSULTANT:
VALECHA ENGINEERING LTD.
PLOT NO. 10, INDUSTRIAL AREA, PHASE II, VILE PARLE (WEST), MUMBAI - 400 056, INDIA

WIDENING AND STRENGTHENING TO TWO LANE PLAN AND LONGITUDINAL SECTION JAGAITPUR TO DURHUA Km. 5000 TO Km. 5170

DATE: 15/05/2006

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



VALECHA ENGINEERING LTD.
Contractor

Chief Engineer,
World Bank Projects, Odisha
World Bank, Plot No. 10,
to the E.I.C. (Civil), Odisha
Bhubaneswar.



VALECHA ENGINEERING LTD
Contractor

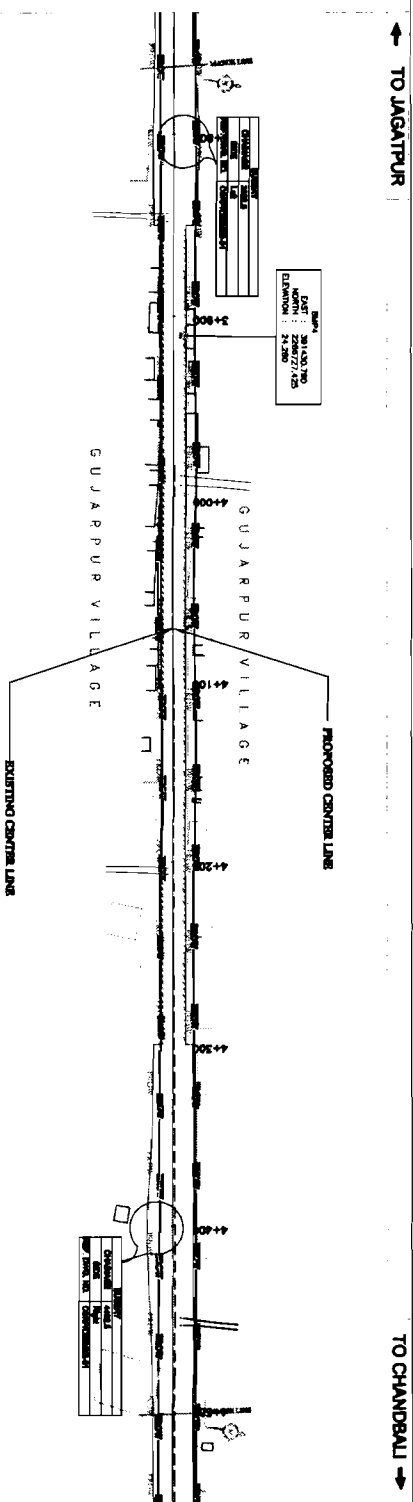
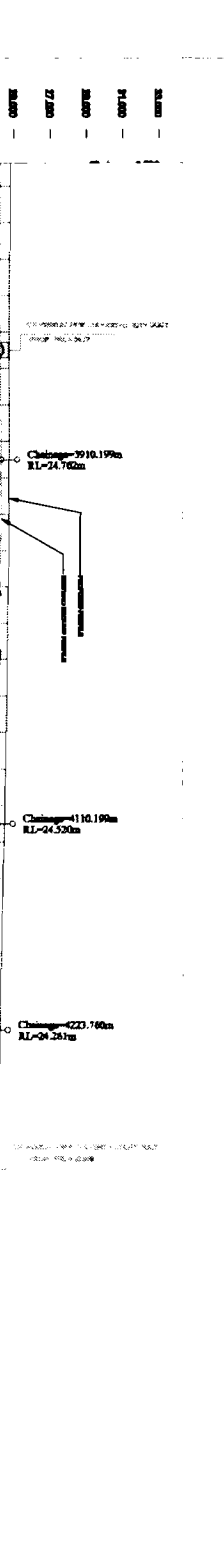
Chief Engineer
Orissa
World Bank Project
Orissa
Odisha
E.I.C.(Civil),
Bhubaneswar.

PROJECT: ORISSA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE		CLIENT: WORKS DEPT. GOVT. OF ORISSA.		CONSULTANT: COMULTIM ENGINEERING WORKSHOP LTD. Plot No. 29/1/4A, New Market, Bhubaneswar-751004		WIDENING AND STRENGTHENING TO TWO LANE PLAN AND LONGITUDINAL SECTION JAGATPUR TO DUMARIA KANJIBO TO KANJIBO	
DESIGN DATA: Design Speed: 40 km/hr Design Life: 15 years Design Traffic: 1000 CVPD Design Lane Width: 3.0 m Design Shoulder Width: 1.5 m Design Subgrade Strength: 100 kg/cm ² Design Factor of Safety: 1.5 Design Wind Speed: 150 km/hr Design Flood Depth: 1.5 m Design Seismicity: Zone II		DESIGN DATA: Design Speed: 40 km/hr Design Life: 15 years Design Traffic: 1000 CVPD Design Lane Width: 3.0 m Design Shoulder Width: 1.5 m Design Subgrade Strength: 100 kg/cm ² Design Factor of Safety: 1.5 Design Wind Speed: 150 km/hr Design Flood Depth: 1.5 m Design Seismicity: Zone II		DESIGN DATA: Design Speed: 40 km/hr Design Life: 15 years Design Traffic: 1000 CVPD Design Lane Width: 3.0 m Design Shoulder Width: 1.5 m Design Subgrade Strength: 100 kg/cm ² Design Factor of Safety: 1.5 Design Wind Speed: 150 km/hr Design Flood Depth: 1.5 m Design Seismicity: Zone II		DESIGN DATA: Design Speed: 40 km/hr Design Life: 15 years Design Traffic: 1000 CVPD Design Lane Width: 3.0 m Design Shoulder Width: 1.5 m Design Subgrade Strength: 100 kg/cm ² Design Factor of Safety: 1.5 Design Wind Speed: 150 km/hr Design Flood Depth: 1.5 m Design Seismicity: Zone II	



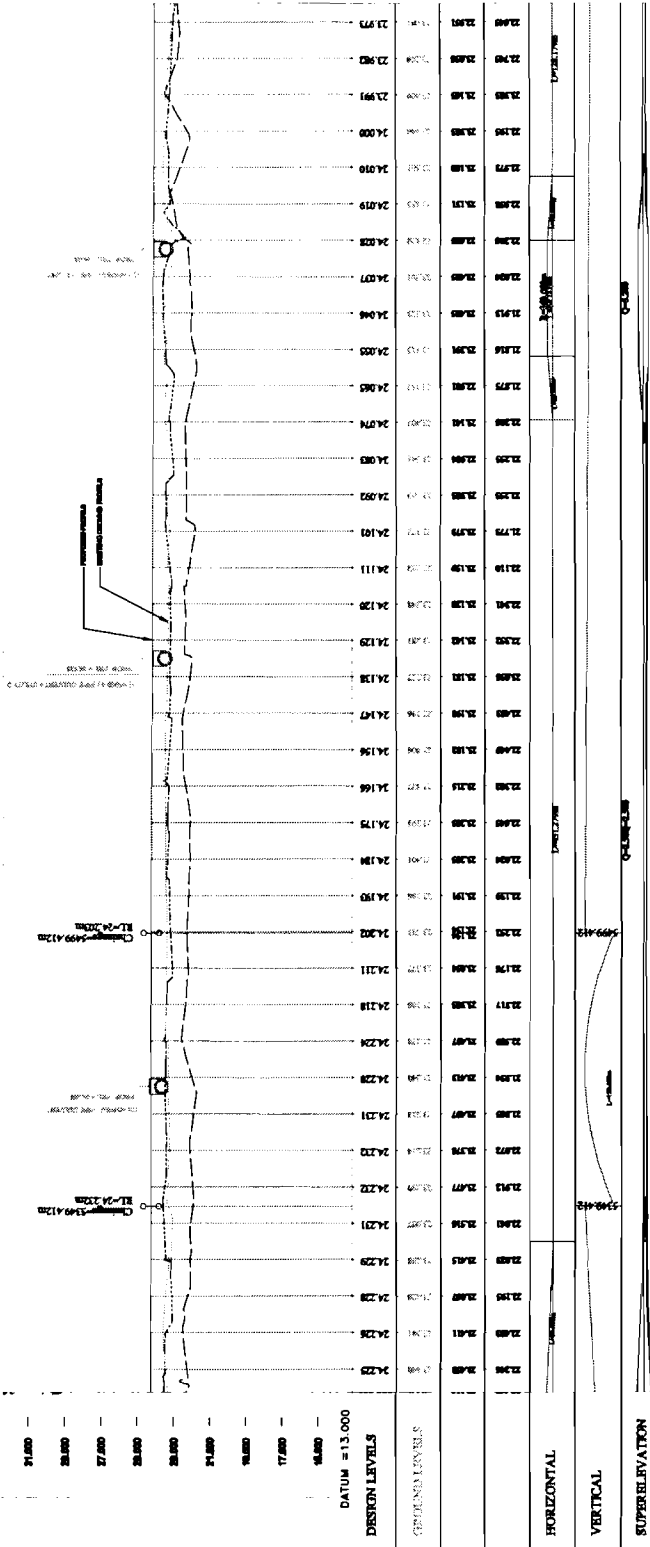
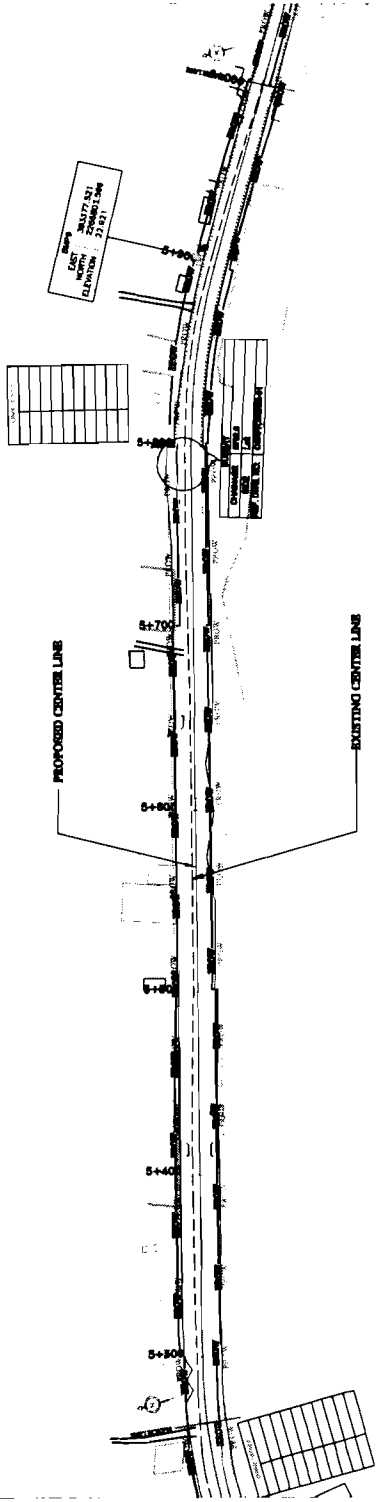
CHAINAGE	PROPOSED LEVEL	EXISTING LEVEL
0+00	24.780	24.780
0+100	24.778	24.778
0+200	24.775	24.775
0+300	24.772	24.772
0+400	24.769	24.769
0+500	24.766	24.766
0+600	24.763	24.763
0+700	24.760	24.760
0+800	24.757	24.757
0+900	24.754	24.754
1+000	24.751	24.751

CHAINAGE	PROPOSED LEVEL	EXISTING LEVEL
1+100	24.748	24.748
1+200	24.745	24.745
1+300	24.742	24.742
1+400	24.739	24.739
1+500	24.736	24.736
1+600	24.733	24.733
1+700	24.730	24.730
1+800	24.727	24.727
1+900	24.724	24.724
2+000	24.721	24.721



TO CHANBALI →

← TO JAGATPUR



Station	Existing Level	Proposed Level
24.000	24.000	24.000
24.010	24.010	24.010
24.020	24.020	24.020
24.030	24.030	24.030
24.040	24.040	24.040
24.050	24.050	24.050
24.060	24.060	24.060
24.070	24.070	24.070
24.080	24.080	24.080
24.090	24.090	24.090
24.100	24.100	24.100
24.110	24.110	24.110
24.120	24.120	24.120
24.130	24.130	24.130
24.140	24.140	24.140
24.150	24.150	24.150
24.160	24.160	24.160
24.170	24.170	24.170
24.180	24.180	24.180
24.190	24.190	24.190
24.200	24.200	24.200
24.210	24.210	24.210
24.220	24.220	24.220
24.230	24.230	24.230
24.240	24.240	24.240
24.250	24.250	24.250
24.260	24.260	24.260
24.270	24.270	24.270
24.280	24.280	24.280
24.290	24.290	24.290
24.300	24.300	24.300
24.310	24.310	24.310
24.320	24.320	24.320
24.330	24.330	24.330
24.340	24.340	24.340
24.350	24.350	24.350
24.360	24.360	24.360
24.370	24.370	24.370
24.380	24.380	24.380
24.390	24.390	24.390
24.400	24.400	24.400
24.410	24.410	24.410
24.420	24.420	24.420
24.430	24.430	24.430
24.440	24.440	24.440
24.450	24.450	24.450
24.460	24.460	24.460
24.470	24.470	24.470
24.480	24.480	24.480
24.490	24.490	24.490
24.500	24.500	24.500
24.510	24.510	24.510
24.520	24.520	24.520
24.530	24.530	24.530
24.540	24.540	24.540
24.550	24.550	24.550
24.560	24.560	24.560
24.570	24.570	24.570
24.580	24.580	24.580
24.590	24.590	24.590
24.600	24.600	24.600
24.610	24.610	24.610
24.620	24.620	24.620
24.630	24.630	24.630
24.640	24.640	24.640
24.650	24.650	24.650
24.660	24.660	24.660
24.670	24.670	24.670
24.680	24.680	24.680
24.690	24.690	24.690
24.700	24.700	24.700

PROJECT: ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE

CLIENT: WORKS DEPT. GOVT. OF ODISHA.

CONSULTANT: VALECHA ENGINEERING LTD. ENGINEERING WORKSHOP LTD.

WIDENING AND STRENGTHENING TO TWO LANE PLAN AND LONGITUDINAL SECTION JAGATPUR TO DURJIA Km. 52870 TO Km. 6000

DATE	SCALE	CAD	CEL
20/01/2018	1:100	1:100	1:100

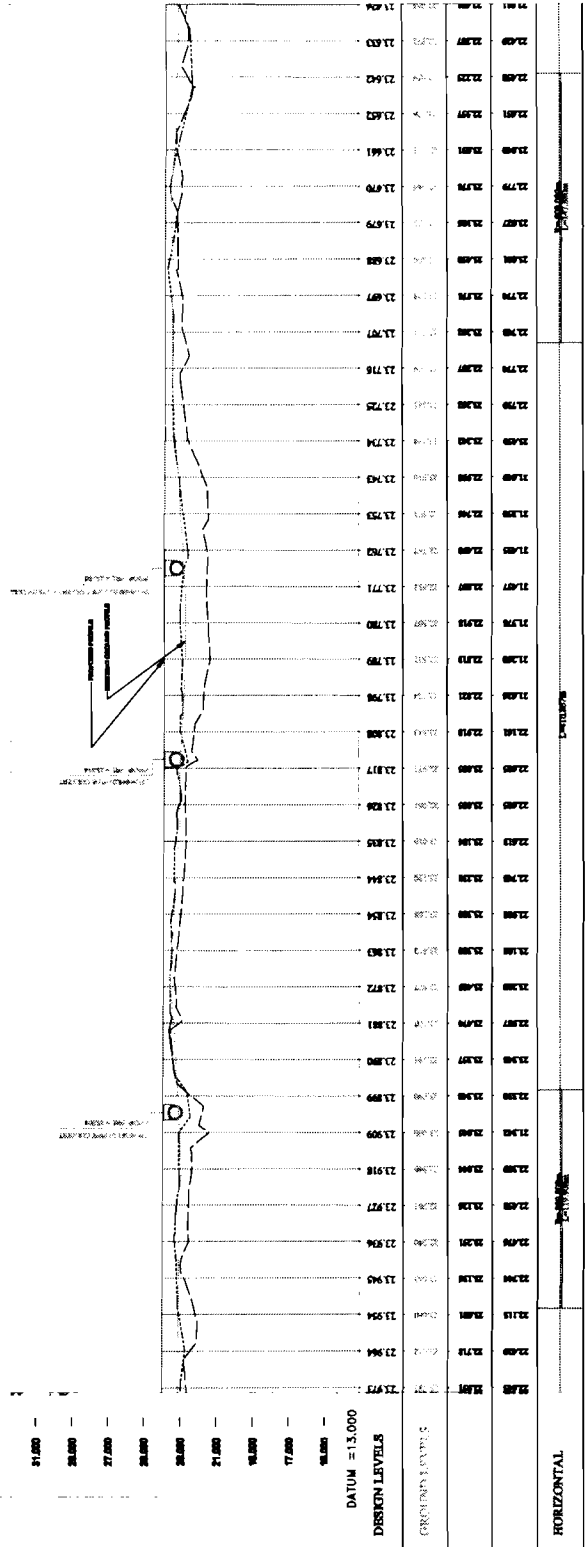
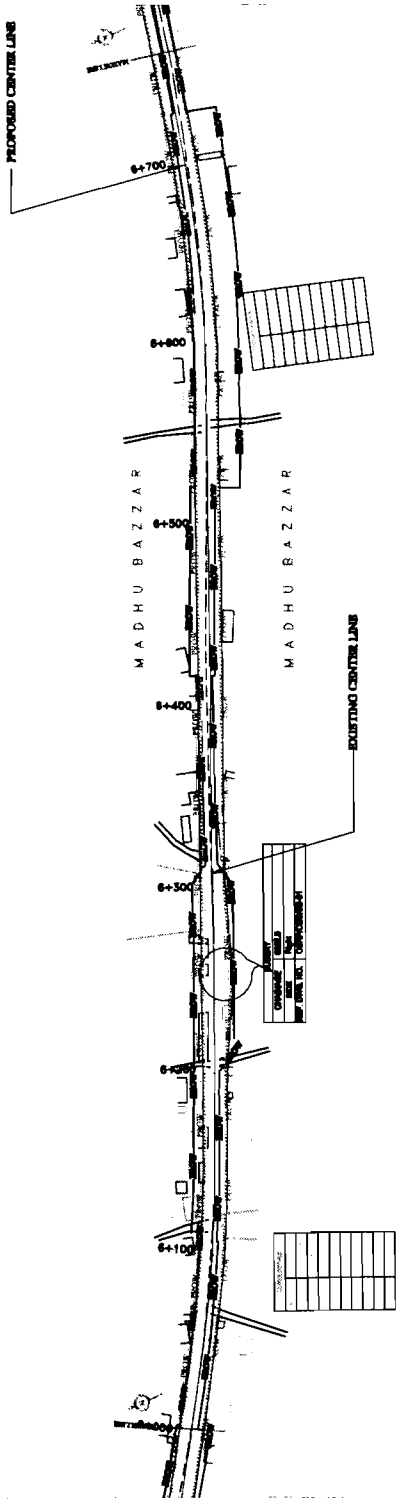
VALECHA ENGINEERING LTD
Contractor



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

TO CHANDBAL →
PROPOSED CENTER LINE

← TO JAGATPUR



STATIONING	EXISTING ELEVATION (M)	PROPOSED ELEVATION (M)
21,975	17.975	17.975
21,980	17.980	17.980
21,985	17.985	17.985
21,990	17.990	17.990
21,995	17.995	17.995
22,000	18.000	18.000
22,005	18.005	18.005
22,010	18.010	18.010
22,015	18.015	18.015
22,020	18.020	18.020
22,025	18.025	18.025
22,030	18.030	18.030
22,035	18.035	18.035
22,040	18.040	18.040
22,045	18.045	18.045
22,050	18.050	18.050
22,055	18.055	18.055
22,060	18.060	18.060
22,065	18.065	18.065
22,070	18.070	18.070
22,075	18.075	18.075
22,080	18.080	18.080
22,085	18.085	18.085
22,090	18.090	18.090
22,095	18.095	18.095
22,100	18.100	18.100
22,105	18.105	18.105
22,110	18.110	18.110
22,115	18.115	18.115
22,120	18.120	18.120
22,125	18.125	18.125
22,130	18.130	18.130
22,135	18.135	18.135
22,140	18.140	18.140
22,145	18.145	18.145
22,150	18.150	18.150
22,155	18.155	18.155
22,160	18.160	18.160
22,165	18.165	18.165
22,170	18.170	18.170
22,175	18.175	18.175
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22,410	18.410	18.410
22,415	18.415	18.415
22,420	18.420	18.420
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22,430	18.430	18.430
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22,450	18.450	18.450
22,455	18.455	18.455
22,460	18.460	18.460
22,465	18.465	18.465
22,470	18.470	18.470
22,475	18.475	18.475
22,480	18.480	18.480
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22,490	18.490	18.490
22,495	18.495	18.495
22,500	18.500	18.500

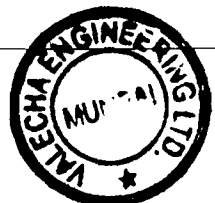
CHAINAGE	SUPERELEVATION
0+000	0.000
0+100	0.100
0+200	0.200
0+300	0.300
0+400	0.400
0+500	0.500
0+600	0.600
0+700	0.700
0+800	0.800
0+900	0.900
1+000	1.000
1+100	1.100
1+200	1.200
1+300	1.300
1+400	1.400
1+500	1.500
1+600	1.600
1+700	1.700
1+800	1.800
1+900	1.900
2+000	2.000
2+100	2.100
2+200	2.200
2+300	2.300
2+400	2.400
2+500	2.500
2+600	2.600
2+700	2.700
2+800	2.800
2+900	2.900
3+000	3.000
3+100	3.100
3+200	3.200
3+300	3.300
3+400	3.400
3+500	3.500
3+600	3.600
3+700	3.700
3+800	3.800
3+900	3.900
4+000	4.000
4+100	4.100
4+200	4.200
4+300	4.300
4+400	4.400
4+500	4.500
4+600	4.600
4+700	4.700
4+800	4.800
4+900	4.900
5+000	5.000
5+100	5.100
5+200	5.200
5+300	5.300
5+400	5.400
5+500	5.500
5+600	5.600
5+700	5.700
5+800	5.800
5+900	5.900
6+000	6.000
6+100	6.100
6+200	6.200
6+300	6.300
6+400	6.400
6+500	6.500
6+600	6.600
6+700	6.700
6+800	6.800
6+900	6.900
7+000	7.000
7+100	7.100
7+200	7.200
7+300	7.300
7+400	7.400
7+500	7.500
7+600	7.600
7+700	7.700
7+800	7.800
7+900	7.900
8+000	8.000
8+100	8.100
8+200	8.200
8+300	8.300
8+400	8.400
8+500	8.500
8+600	8.600
8+700	8.700
8+800	8.800
8+900	8.900
9+000	9.000
9+100	9.100
9+200	9.200
9+300	9.300
9+400	9.400
9+500	9.500
9+600	9.600
9+700	9.700
9+800	9.800
9+900	9.900
10+000	10.000

PROJECT: ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

CLIENT: GOVT. OF ODISHA

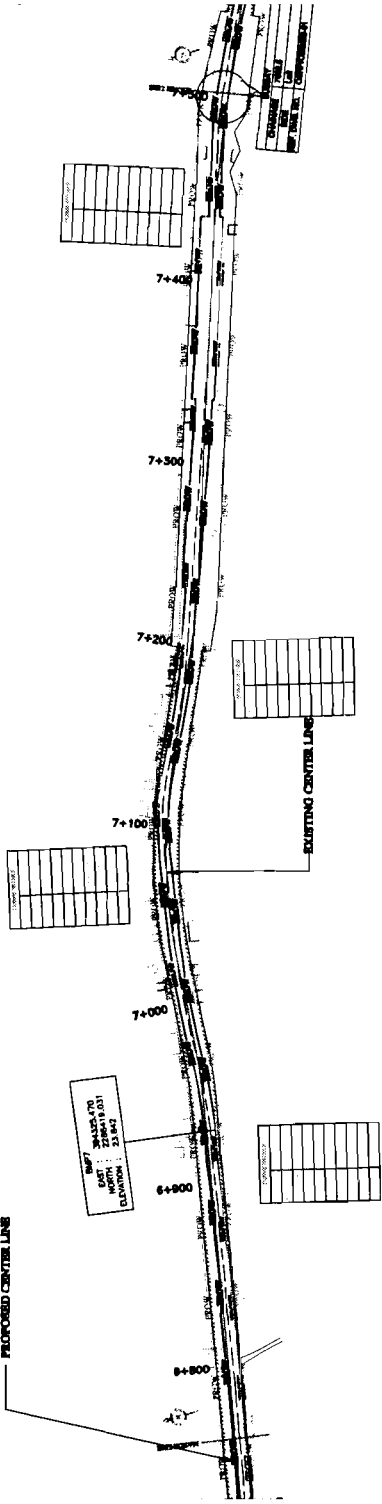
CONSULTANT: VALECHA ENGINEERING LTD.

WIDENING AND STRENGTHENING TO TWO LANE PLAN AND LONGITUDINAL SECTION JAGATPUR TO DURUA Km.80070 Km.8700



TO CHANDBALI →

← TO JAGATPUR



CHAINAGE	HORIZONTAL		VERTICAL	
	CHORD BEARING	CHORD DISTANCE	CHORD BEARING	CHORD DISTANCE
7+00	22.924	12.72	22.924	12.72
7+100	22.931	12.72	22.931	12.72
7+200	22.938	12.72	22.938	12.72
7+300	22.945	12.72	22.945	12.72
7+400	22.952	12.72	22.952	12.72

CHAINAGE	HORIZONTAL		VERTICAL	
	CHORD BEARING	CHORD DISTANCE	CHORD BEARING	CHORD DISTANCE
7+00	22.924	12.72	22.924	12.72
7+100	22.931	12.72	22.931	12.72
7+200	22.938	12.72	22.938	12.72
7+300	22.945	12.72	22.945	12.72
7+400	22.952	12.72	22.952	12.72

CHAINAGE	HORIZONTAL		VERTICAL	
	CHORD BEARING	CHORD DISTANCE	CHORD BEARING	CHORD DISTANCE
7+00	22.924	12.72	22.924	12.72
7+100	22.931	12.72	22.931	12.72
7+200	22.938	12.72	22.938	12.72
7+300	22.945	12.72	22.945	12.72
7+400	22.952	12.72	22.952	12.72

PROJECT:	ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE
CLIENT:	WORKS DEPT. GOVT. OF ODISHA
CONSULTANT:	G O S U L T I N G ENGINEERS, WEIPHOOP LTD. (PVT) LTD. 13/1/10, Connaught Place, New Delhi-110021, INDIA. TEL: 2323545, FAX: 2323546
DESIGNER:	NAME: DATE: SCALE: SHEET NO. OF TOTAL SHEETS: PROJECT NO. DRAWING NO.

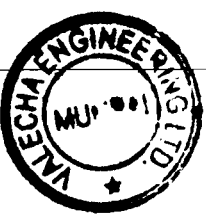
DATE: 15/01/2010

SCALE: 1:1000

SHEET NO. 21 OF 25

PROJECT NO. 101/2008/OD

DRAWING NO. 101/2008/OD/21

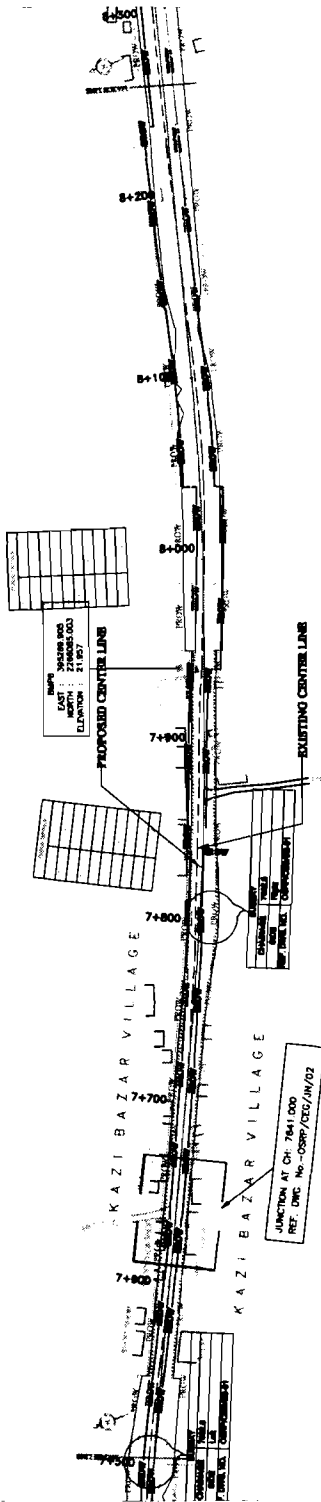


VALECHA ENGINEERING LTD
Contractor

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

TO CHANDBALL →

← TO JAGATPUR



STATION	GROUND LEVEL	DESIGN LEVEL	VERTICAL CURVE DATA
7+000	22.75	22.75	
7+100	22.80	22.80	
7+200	22.85	22.85	
7+300	22.90	22.90	
7+400	22.95	22.95	
7+500	23.00	23.00	
7+600	23.05	23.05	
7+700	23.10	23.10	
7+800	23.15	23.15	
7+900	23.20	23.20	
8+000	23.25	23.25	
8+100	23.30	23.30	
8+200	23.35	23.35	

STATION	PROPOSED GRADE	VERTICAL CURVE DATA
7+000	22.75	
7+100	22.80	
7+200	22.85	
7+300	22.90	
7+400	22.95	
7+500	23.00	
7+600	23.05	
7+700	23.10	
7+800	23.15	
7+900	23.20	
8+000	23.25	
8+100	23.30	
8+200	23.35	

CHAINAGE	PROPOSED GRADE	VERTICAL CURVE DATA
7+000	22.75	
7+100	22.80	
7+200	22.85	
7+300	22.90	
7+400	22.95	
7+500	23.00	
7+600	23.05	
7+700	23.10	
7+800	23.15	
7+900	23.20	
8+000	23.25	
8+100	23.30	
8+200	23.35	

DATE	14/05/20
SCALE	1:1000
PROJECT	ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE
CLIENT	WORKS DEPT. GOVT. OF ODISHA
CONSULTANT	VALECHA ENGINEERING CONSULTANTS PVT. LTD.
PROJECT LOCATION	JAGATPUR TO DABURIA, Km. 7/600 TO 8/200
SCALE	1:1000
DATE	14/05/20

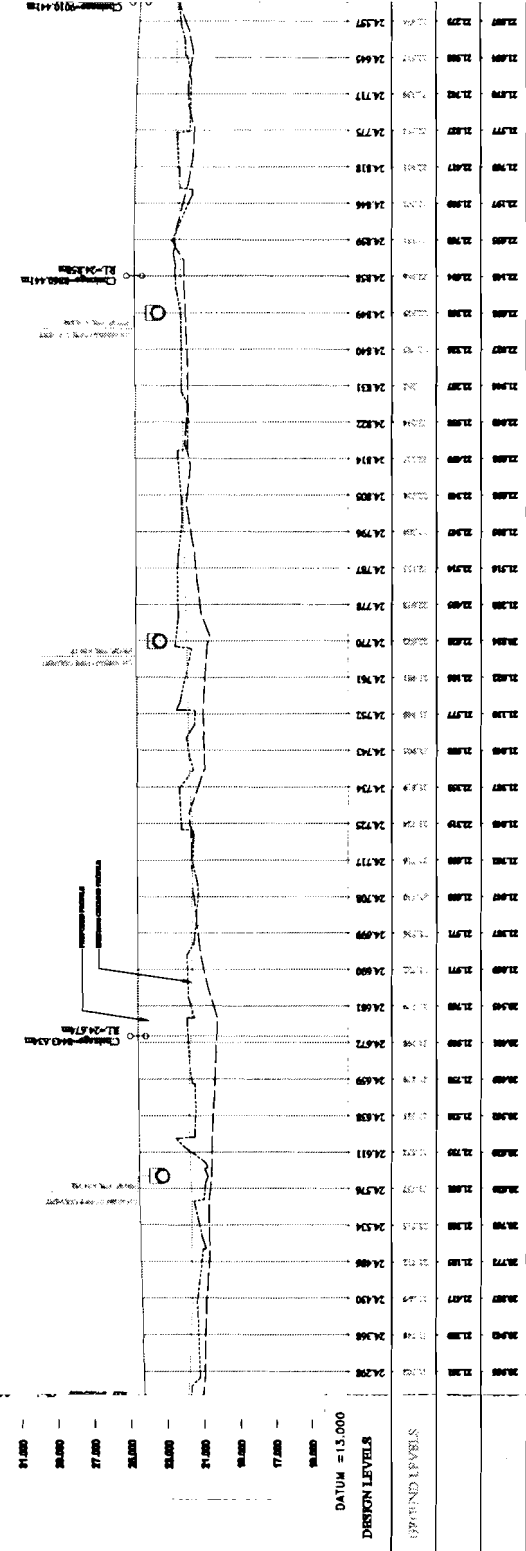
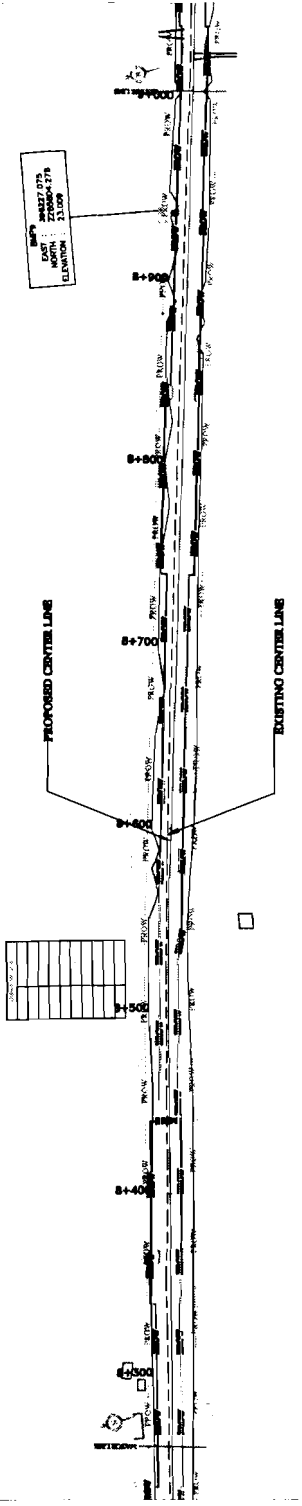


VALECHA ENGINEERING LTD
Contractor

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

TO CHANDBALI →

← TO JAGATPUR



CHAINAGE	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	2500	2600	2700	2800	2900	3000	3100	3200	3300	3400	3500	3600	3700	3800	3900	4000	4100	4200	4300	4400	4500	4600	4700	4800	4900	5000	5100	5200	5300	5400	5500	5600	5700	5800	5900	6000	6100	6200	6300	6400	6500	6600	6700	6800	6900	7000	7100	7200	7300	7400	7500	7600	7700	7800	7900	8000	8100	8200	8300	8400	8500	8600	8700	8800	8900	9000	9100	9200	9300	9400	9500	9600	9700	9800	9900	10000
----------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	-------

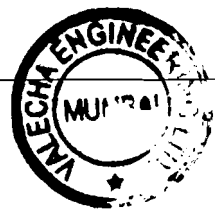
PROJECT: ORISSA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE

CLIENT: WORKS DEPT. GOVT. OF ORISSA

CONSULTANT: VALECHA ENGINEERING LTD. ENGINEERING WORKSHOP LTD.

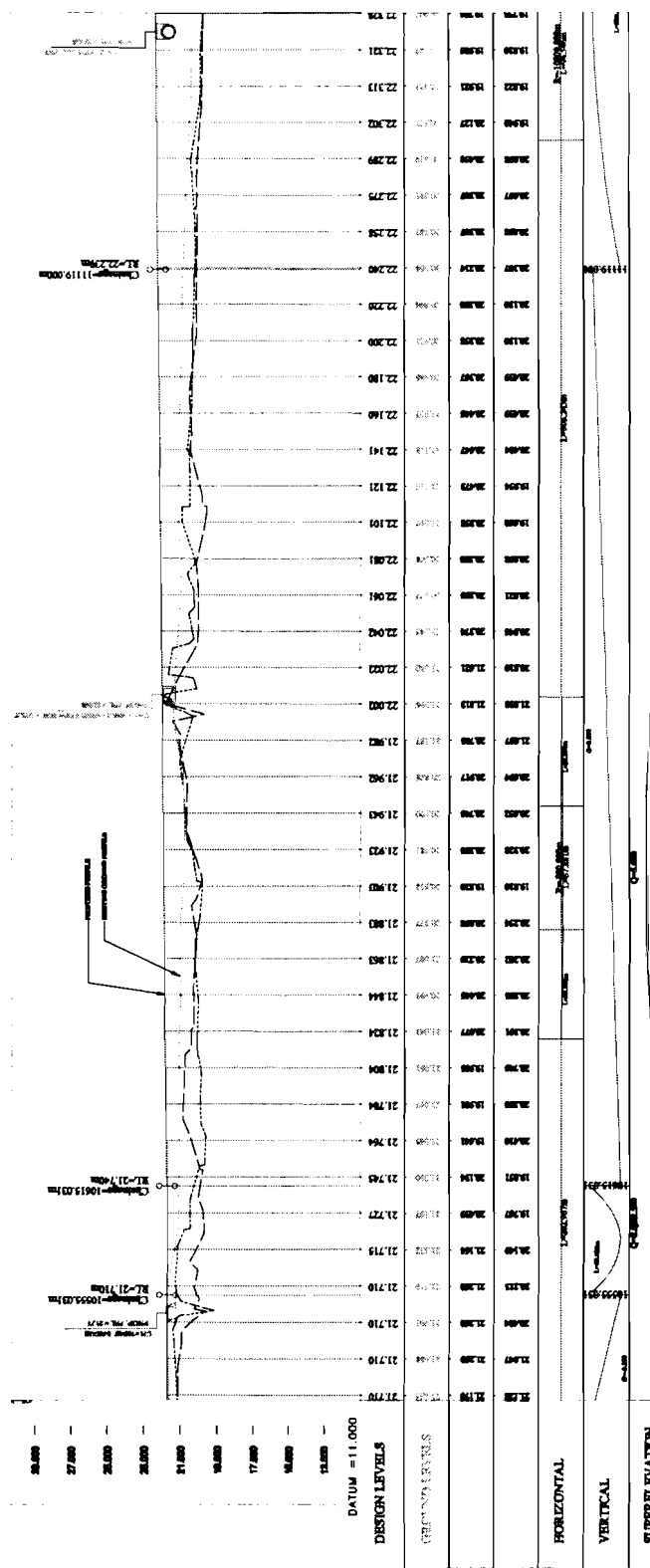
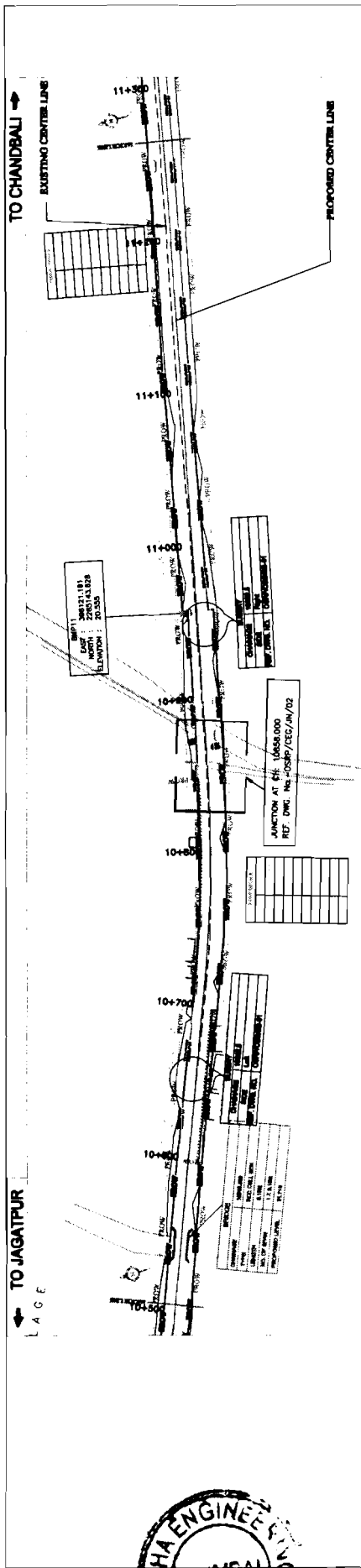
WIDENING AND STRENGTHENING TO TWO LANE PLAN AND LONGITUDINAL SECTION JAGATPUR TO DUNURIA Km. 62870 TO Km. 63000

DATE	BY	CHKD.	APPD.



VALECHA ENGINEERING LTD
Contractor

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

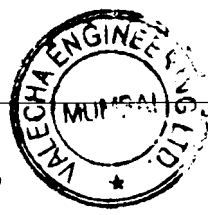


CHAINAGE	ELEVATION	VERTICAL CURVE DATA
10638.000	28.200	
10639.000	27.800	
10640.000	28.500	
10641.000	28.800	
10642.000	31.000	
10643.000	29.500	
10644.000	17.800	
10645.000	18.500	
10646.000	18.000	
10647.000	18.500	
10648.000	18.800	
10649.000	18.000	
10650.000	19.000	
10651.000	19.500	
10652.000	20.000	
10653.000	20.500	
10654.000	21.000	
10655.000	21.500	
10656.000	22.000	
10657.000	22.500	
10658.000	23.000	
10659.000	23.500	
10660.000	24.000	
10661.000	24.500	
10662.000	25.000	
10663.000	25.500	
10664.000	26.000	
10665.000	26.500	
10666.000	27.000	
10667.000	27.500	
10668.000	28.000	
10669.000	28.500	
10670.000	29.000	
10671.000	29.500	
10672.000	30.000	
10673.000	30.500	
10674.000	31.000	
10675.000	31.500	
10676.000	32.000	
10677.000	32.500	
10678.000	33.000	
10679.000	33.500	
10680.000	34.000	
10681.000	34.500	
10682.000	35.000	
10683.000	35.500	
10684.000	36.000	
10685.000	36.500	
10686.000	37.000	
10687.000	37.500	
10688.000	38.000	
10689.000	38.500	
10690.000	39.000	
10691.000	39.500	
10692.000	40.000	
10693.000	40.500	
10694.000	41.000	
10695.000	41.500	
10696.000	42.000	
10697.000	42.500	
10698.000	43.000	
10699.000	43.500	
10700.000	44.000	

CONSULTANT: WIDENING AND STRENGTHENING TO TWO LAKE PLAN AND LONGITUDINAL SECTION JAGATPUR TO DAKHURA Km. 10/80/0 TO Km. 11/280

CLIENT: WORKS DEPT. GOVT. OF ODISHA

PROJECT: ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE

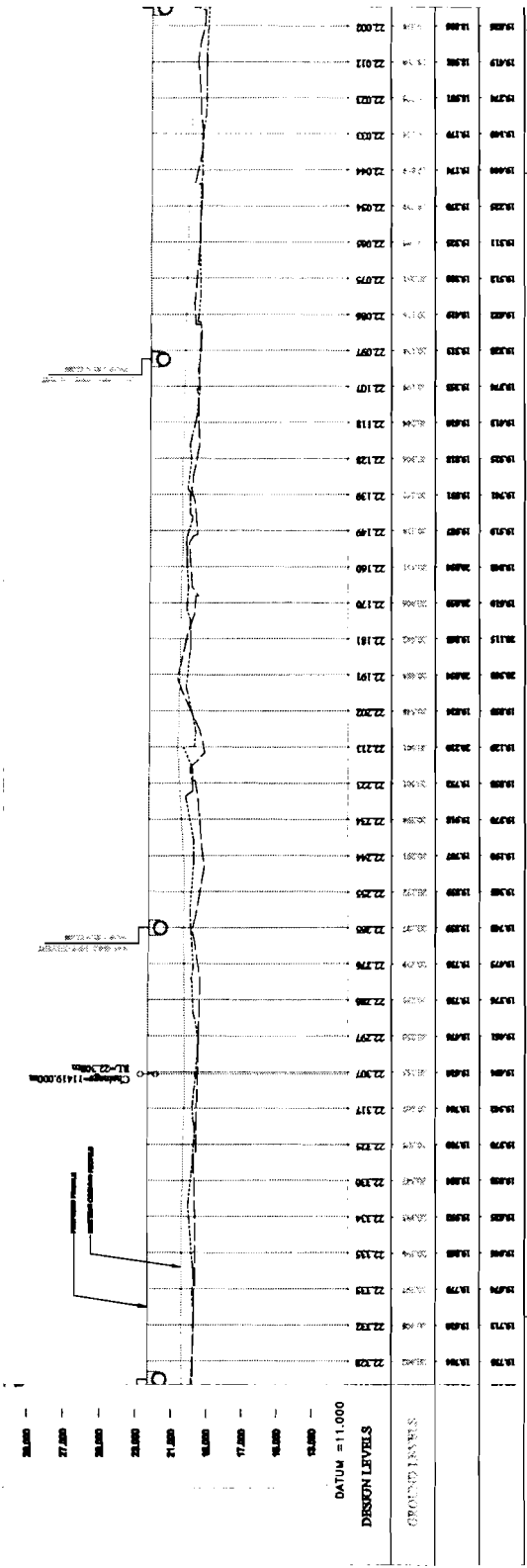
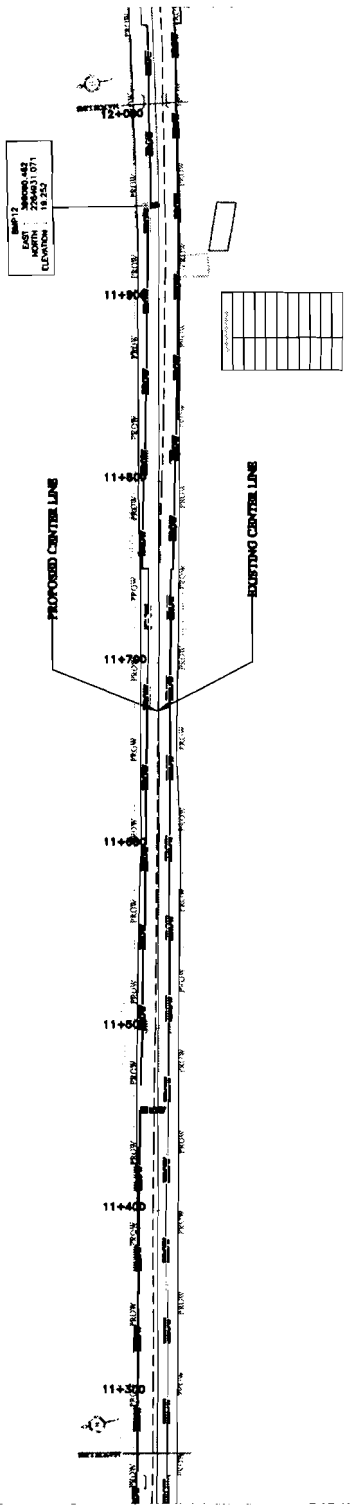


VALECHA ENGINEERING LTD
Contractor

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

TO CHANDBALI →

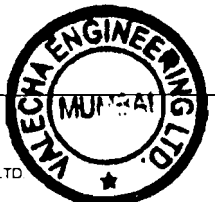
← TO JAGATPUR



STATION	GROUND LEVEL	DESIGN LEVEL
11+750	18.250	18.250
11+800	18.250	18.250
11+850	18.250	18.250
11+900	18.250	18.250
11+950	18.250	18.250
12+000	18.250	18.250
12+050	18.250	18.250
12+100	18.250	18.250
12+150	18.250	18.250
12+200	18.250	18.250
12+250	18.250	18.250
12+300	18.250	18.250
12+350	18.250	18.250
12+400	18.250	18.250
12+450	18.250	18.250
12+500	18.250	18.250
12+550	18.250	18.250
12+600	18.250	18.250
12+650	18.250	18.250
12+700	18.250	18.250
12+750	18.250	18.250
12+800	18.250	18.250
12+850	18.250	18.250
12+900	18.250	18.250
12+950	18.250	18.250
13+000	18.250	18.250

CHAINAGE	PROPOSED CENTERLINE	EXISTING CENTERLINE
11+750	11+750	11+750
11+800	11+800	11+800
11+850	11+850	11+850
11+900	11+900	11+900
11+950	11+950	11+950
12+000	12+000	12+000
12+050	12+050	12+050
12+100	12+100	12+100
12+150	12+150	12+150
12+200	12+200	12+200
12+250	12+250	12+250
12+300	12+300	12+300
12+350	12+350	12+350
12+400	12+400	12+400
12+450	12+450	12+450
12+500	12+500	12+500
12+550	12+550	12+550
12+600	12+600	12+600
12+650	12+650	12+650
12+700	12+700	12+700
12+750	12+750	12+750
12+800	12+800	12+800
12+850	12+850	12+850
12+900	12+900	12+900
12+950	12+950	12+950
13+000	13+000	13+000

DATE	12/12/2010
SCALE	1:1000
PROJECT	ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE
CLIENT	WORKS DEPT. GOVT. OF ODISHA
CONSULTANT	COMSULTING ENGINEERS, WESTBURY LTD. (PVT) LTD.
CONTRACT NO.	11/28/070
SECTION	PLAN AND LONGITUDINAL SECTION
STATION	11+750 TO 13+000

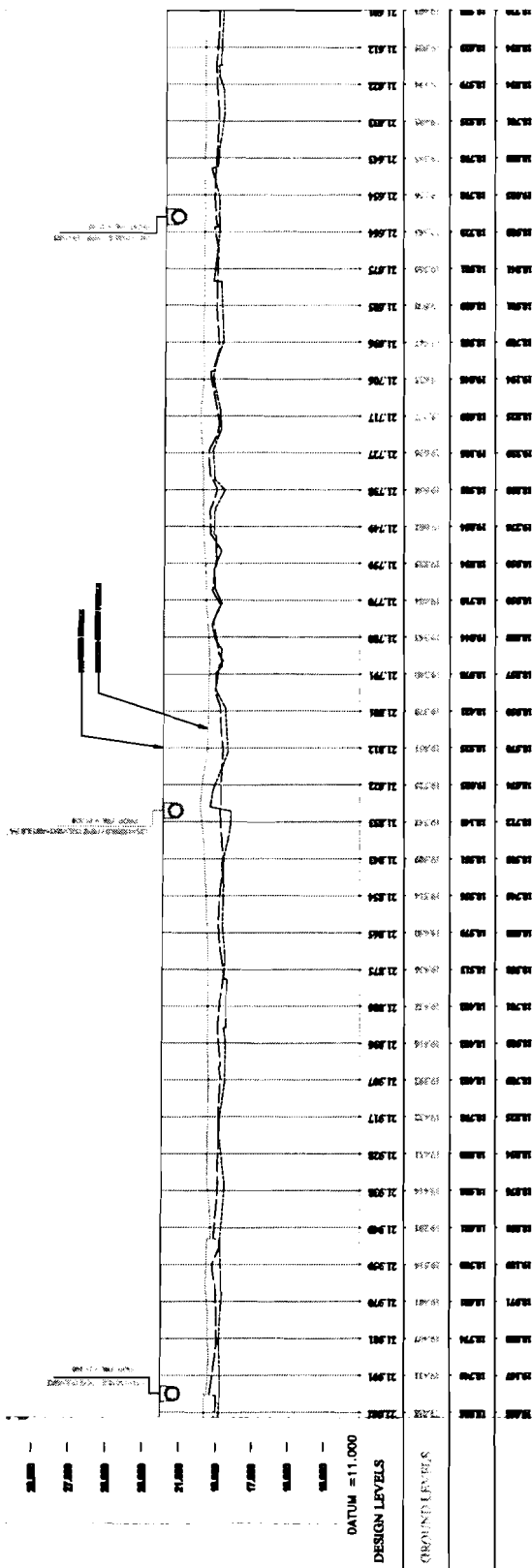
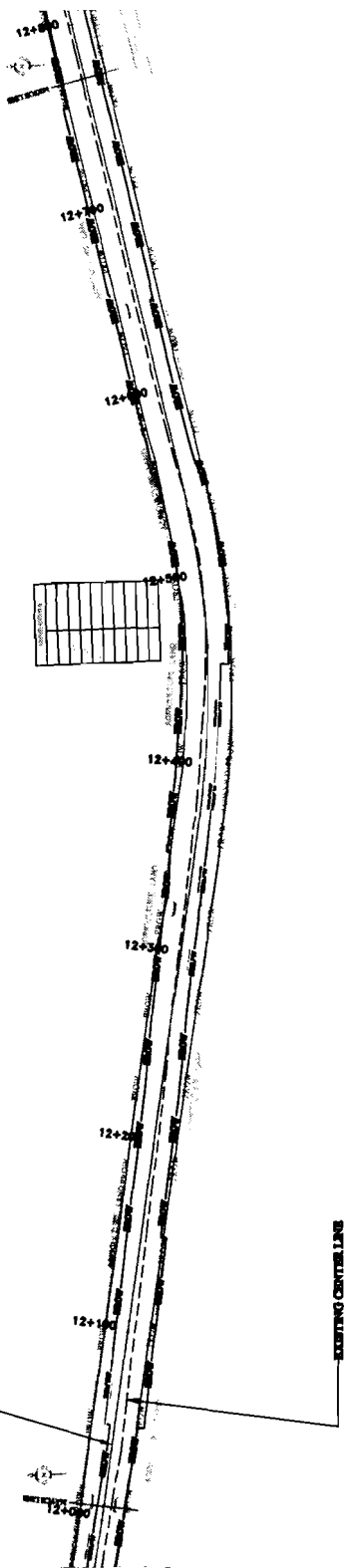


VALECHA ENGINEERING LTD
Contractor

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

TO CHANDBALI →

← TO JAGATPUR



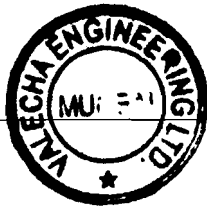
CHAINAGE	HORIZONTAL		VERTICAL		SUPERELEVATION
	PC	PT	PG	PG+1	
12790.000					
12780.000					
12770.000					
12760.000					
12750.000					
12740.000					
12730.000					
12720.000					
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12060.000					
12050.000					
12040.000					
12030.000					
12020.000					
12010.000					
12000.000					

CONSULTANT:
CONSULTING ENGINEERS
 PRADEEP, WINDUPUR LITE
 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 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.

CLIENT:
 WORLD BANK
 GOVT. OF ODISHA

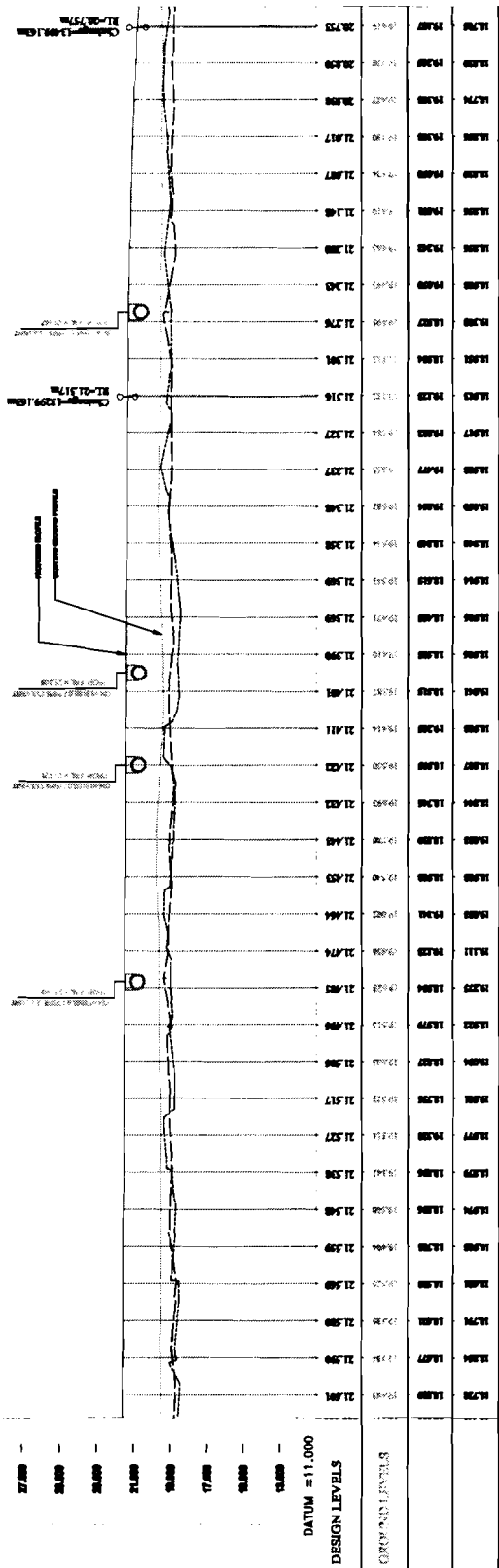
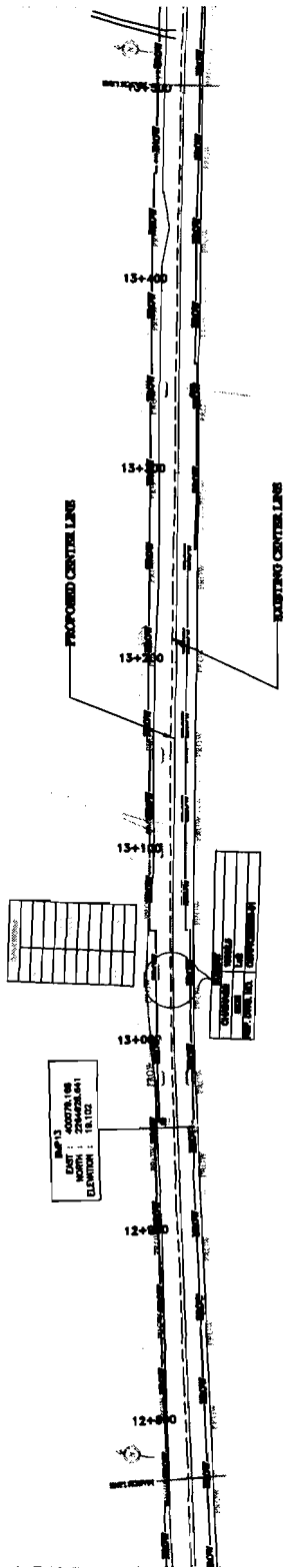
PROJECT:
 ODISHA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE

DATE: 12/01/2011
SCALE: 1:1000
PROJECT NO.: 12/01/2011
DESIGN NO.: 12/01/2011
REVISION: 1
APPROVED BY: [Signature]
CHECKED BY: [Signature]
DRAWN BY: [Signature]



TO CHANDBALI →

← TO JAGATPUR



CHAINAGE	HORIZONTAL		VERTICAL		SUPERELEVATION
	PC	PT	PVI	ELEVATION	
12780.00	12780.00	12780.00	12780.00	12.800	
12800.00	12800.00	12800.00	12800.00	12.800	
12820.00	12820.00	12820.00	12820.00	12.800	
12840.00	12840.00	12840.00	12840.00	12.800	
12860.00	12860.00	12860.00	12860.00	12.800	
12880.00	12880.00	12880.00	12880.00	12.800	
12900.00	12900.00	12900.00	12900.00	12.800	
12920.00	12920.00	12920.00	12920.00	12.800	
12940.00	12940.00	12940.00	12940.00	12.800	
12960.00	12960.00	12960.00	12960.00	12.800	
12980.00	12980.00	12980.00	12980.00	12.800	
13000.00	13000.00	13000.00	13000.00	12.800	
13020.00	13020.00	13020.00	13020.00	12.800	
13040.00	13040.00	13040.00	13040.00	12.800	
13060.00	13060.00	13060.00	13060.00	12.800	
13080.00	13080.00	13080.00	13080.00	12.800	
13100.00	13100.00	13100.00	13100.00	12.800	
13120.00	13120.00	13120.00	13120.00	12.800	
13140.00	13140.00	13140.00	13140.00	12.800	
13160.00	13160.00	13160.00	13160.00	12.800	
13180.00	13180.00	13180.00	13180.00	12.800	
13200.00	13200.00	13200.00	13200.00	12.800	
13220.00	13220.00	13220.00	13220.00	12.800	
13240.00	13240.00	13240.00	13240.00	12.800	
13260.00	13260.00	13260.00	13260.00	12.800	
13280.00	13280.00	13280.00	13280.00	12.800	
13300.00	13300.00	13300.00	13300.00	12.800	
13320.00	13320.00	13320.00	13320.00	12.800	
13340.00	13340.00	13340.00	13340.00	12.800	
13360.00	13360.00	13360.00	13360.00	12.800	
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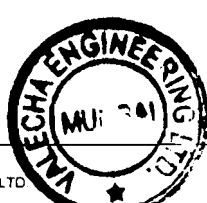
PROJECT: COMRA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE

CLIENT: WORKS DEPT. GOVT. OF ODISHA

CONSULTANT: CONSULTING ENGINEERS LTD. (Logo)

WIDENING AND STRENGTHENING TO TWO LANE PLAN AND LONGITUDINAL SECTION JAGATPUR TO DURLIHA Km. 12780 TO Km. 13600

LEGEND: (Symbol for center line, etc.)

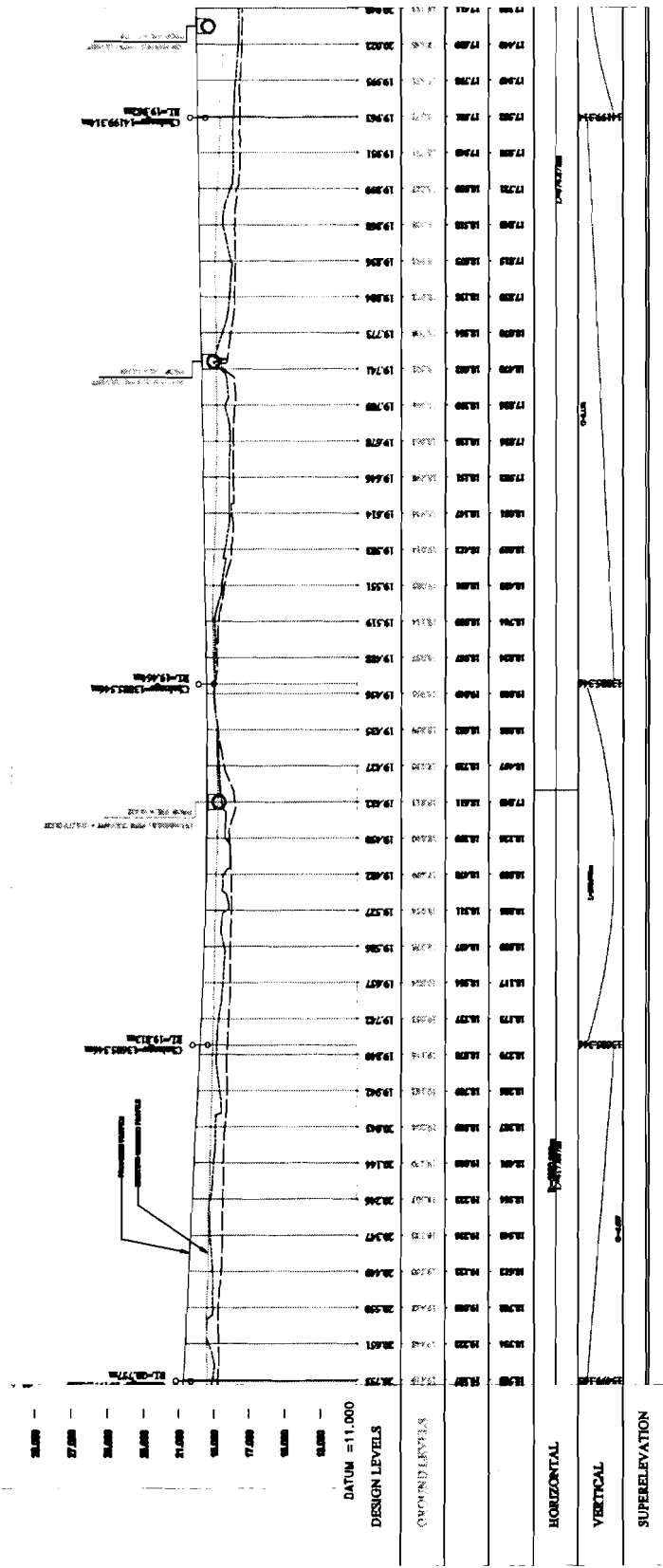
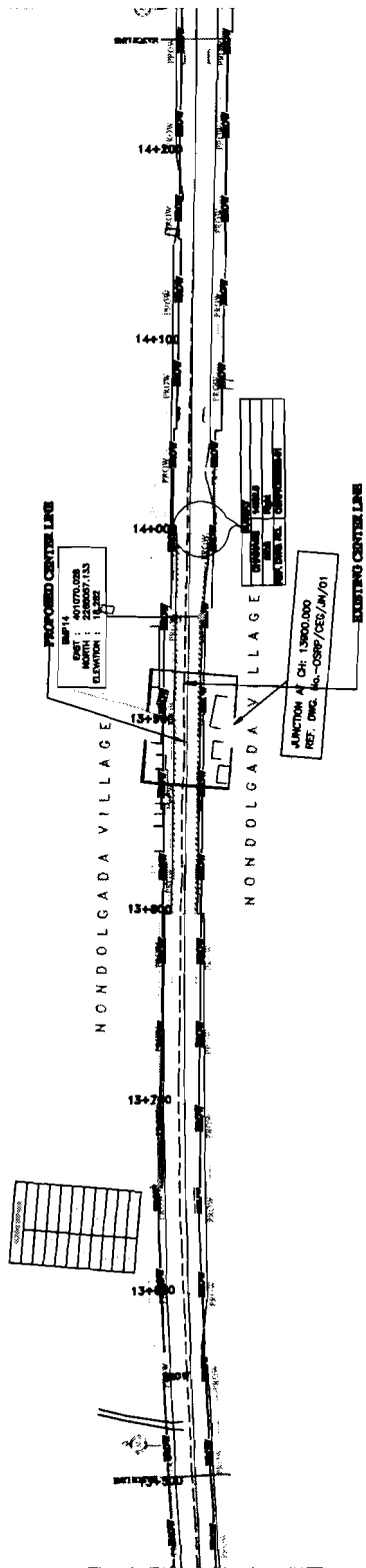


VALECHA ENGINEERING LTD
Contractor

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

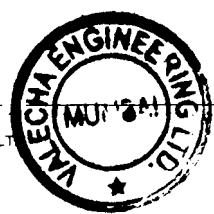
← TO JAGATPUR →

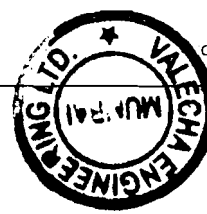
← TO CHANDBALI →



CHANGING	GROUND LEVELS	DESIGN LEVELS	DATUM = 11,000
13+7.0	26.800	26.800	26.800
13+8.0	27.200	27.200	27.200
13+9.0	26.800	26.800	26.800
13+10.0	26.800	26.800	26.800
13+11.0	27.100	27.100	27.100
13+12.0	26.800	26.800	26.800
13+13.0	27.000	27.000	27.000
13+14.0	26.800	26.800	26.800
13+15.0	26.800	26.800	26.800
13+16.0	26.800	26.800	26.800
13+17.0	26.800	26.800	26.800
13+18.0	26.800	26.800	26.800
13+19.0	26.800	26.800	26.800
13+20.0	26.800	26.800	26.800
13+21.0	26.800	26.800	26.800
13+22.0	26.800	26.800	26.800
13+23.0	26.800	26.800	26.800
13+24.0	26.800	26.800	26.800
13+25.0	26.800	26.800	26.800
13+26.0	26.800	26.800	26.800
13+27.0	26.800	26.800	26.800
13+28.0	26.800	26.800	26.800
13+29.0	26.800	26.800	26.800
13+30.0	26.800	26.800	26.800
13+31.0	26.800	26.800	26.800
13+32.0	26.800	26.800	26.800
13+33.0	26.800	26.800	26.800
13+34.0	26.800	26.800	26.800
13+35.0	26.800	26.800	26.800
13+36.0	26.800	26.800	26.800
13+37.0	26.800	26.800	26.800
13+38.0	26.800	26.800	26.800
13+39.0	26.800	26.800	26.800
13+40.0	26.800	26.800	26.800
13+41.0	26.800	26.800	26.800
13+42.0	26.800	26.800	26.800
13+43.0	26.800	26.800	26.800
13+44.0	26.800	26.800	26.800
13+45.0	26.800	26.800	26.800
13+46.0	26.800	26.800	26.800
13+47.0	26.800	26.800	26.800
13+48.0	26.800	26.800	26.800
13+49.0	26.800	26.800	26.800
13+50.0	26.800	26.800	26.800
13+51.0	26.800	26.800	26.800
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13+60.0	26.800	26.800	26.800
13+61.0	26.800	26.800	26.800
13+62.0	26.800	26.800	26.800
13+63.0	26.800	26.800	26.800
13+64.0	26.800	26.800	26.800
13+65.0	26.800	26.800	26.800
13+66.0	26.800	26.800	26.800
13+67.0	26.800	26.800	26.800
13+68.0	26.800	26.800	26.800
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14+17.0	26.800	26.800	26.800
14+18.0	26.800	26.800	26.800
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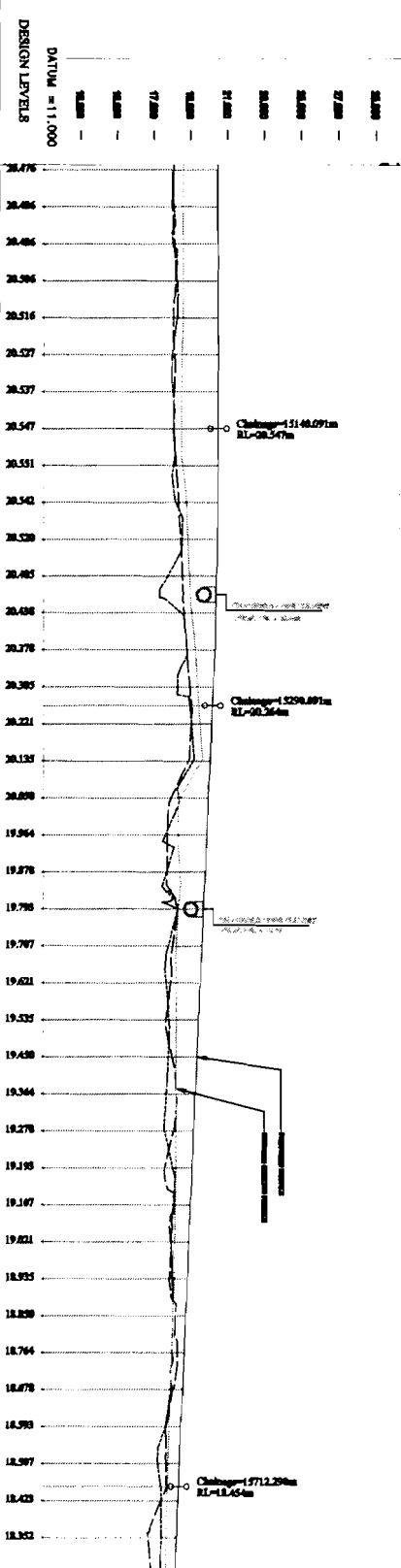
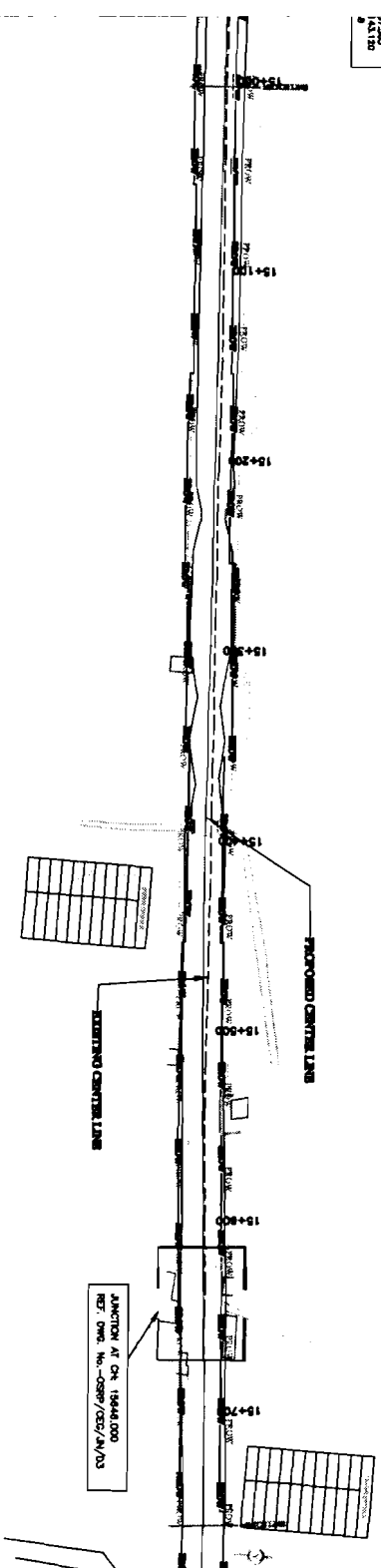
PROJECT:	ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE
CLIENT:	WORKS DEPT. GOVT. OF ODISHA
CONSULTANT:	VALECHA ENGINEERING LTD. CONSULTING ENGINEERS, BHUBANESWAR
DATE:	15/06/2014
SCALE:	1:1000
PROJECT NO.:	14/11/11/2014/ODR/2014/2014
DATE OF PREPARED:	15/06/2014
DATE OF CHECK:	15/06/2014
DATE OF APPROVAL:	15/06/2014





TO JAGATPUR

TO CHANDBALI



STATION	PROPOSED LEVEL (m)	DESIGN LEVEL (m)	PROPOSED ELEVATION (m)	HORIZONTAL	VERTICAL	SUPER ELEVATION	CHANGE
15.000	18.78	18.78	18.78				
15.010	18.80	18.80	18.80				
15.020	18.82	18.82	18.82				
15.030	18.84	18.84	18.84				
15.040	18.86	18.86	18.86				
15.050	18.88	18.88	18.88				
15.060	18.90	18.90	18.90				
15.070	18.92	18.92	18.92				
15.080	18.94	18.94	18.94				
15.090	18.96	18.96	18.96				
15.100	18.98	18.98	18.98				
15.110	19.00	19.00	19.00				
15.120	19.02	19.02	19.02				
15.130	19.04	19.04	19.04				
15.140	19.06	19.06	19.06				
15.150	19.08	19.08	19.08				
15.160	19.10	19.10	19.10				
15.170	19.12	19.12	19.12				
15.180	19.14	19.14	19.14				
15.190	19.16	19.16	19.16				
15.200	19.18	19.18	19.18				
15.210	19.20	19.20	19.20				
15.220	19.22	19.22	19.22				
15.230	19.24	19.24	19.24				
15.240	19.26	19.26	19.26				
15.250	19.28	19.28	19.28				
15.260	19.30	19.30	19.30				
15.270	19.32	19.32	19.32				
15.280	19.34	19.34	19.34				
15.290	19.36	19.36	19.36				
15.300	19.38	19.38	19.38				
15.310	19.40	19.40	19.40				
15.320	19.42	19.42	19.42				
15.330	19.44	19.44	19.44				
15.340	19.46	19.46	19.46				
15.350	19.48	19.48	19.48				
15.360	19.50	19.50	19.50				
15.370	19.52	19.52	19.52				
15.380	19.54	19.54	19.54				
15.390	19.56	19.56	19.56				
15.400	19.58	19.58	19.58				
15.410	19.60	19.60	19.60				
15.420	19.62	19.62	19.62				
15.430	19.64	19.64	19.64				
15.440	19.66	19.66	19.66				
15.450	19.68	19.68	19.68				
15.460	19.70	19.70	19.70				
15.470	19.72	19.72	19.72				
15.480	19.74	19.74	19.74				
15.490	19.76	19.76	19.76				
15.500	19.78	19.78	19.78				
15.510	19.80	19.80	19.80				
15.520	19.82	19.82	19.82				
15.530	19.84	19.84	19.84				
15.540	19.86	19.86	19.86				
15.550	19.88	19.88	19.88				
15.560	19.90	19.90	19.90				
15.570	19.92	19.92	19.92				
15.580	19.94	19.94	19.94				
15.590	19.96	19.96	19.96				
15.600	19.98	19.98	19.98				
15.610	20.00	20.00	20.00				

PROJECT:
 ODISHA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE

CLIENT:
 WORKS DEPT.
 GOVT. OF ODISHA

CONSULTANT:
 VALECHA ENGINEERING LTD.
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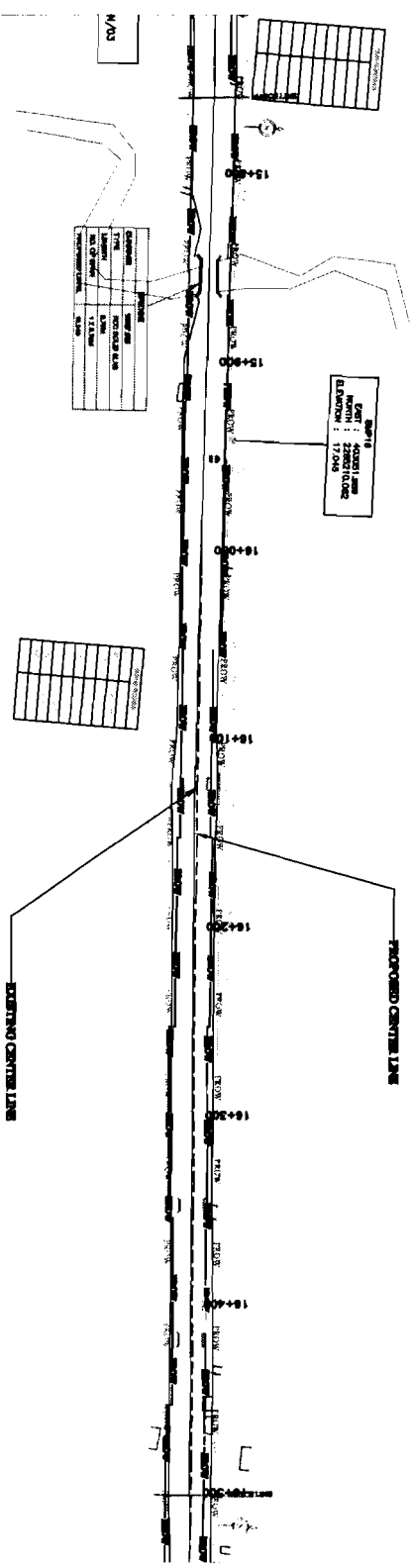


VALECHA ENGINEERING LTD
Contractor

Chief Engineer
W & S
for the E.L.C.O.(M),
Shubhaswar.

TO JAGATPUR

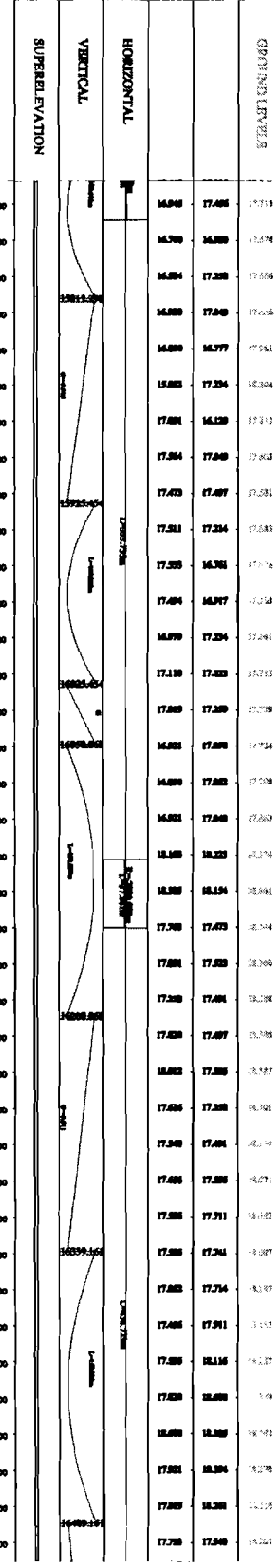
TO CHANDBALI



DESIGN LEVELS
DATUM = 11.000

Station	Ground Level (m)	Design Level (m)
15+00	18.29	18.29
15+20	18.32	18.32
15+40	18.34	18.34
15+60	18.34	18.34
15+80	18.34	18.34
16+00	18.34	18.34
16+20	18.34	18.34
16+40	18.34	18.34
16+60	18.34	18.34
16+80	18.34	18.34
17+00	18.34	18.34
17+20	18.34	18.34
17+40	18.34	18.34
17+60	18.34	18.34
17+80	18.34	18.34
18+00	18.34	18.34
18+20	18.34	18.34
18+40	18.34	18.34
18+60	18.34	18.34
18+80	18.34	18.34
19+00	18.34	18.34

CHANGES:
 Change-1: 1812.50m EL=18.50m
 Change-2: 1921.45m EL=18.50m
 Change-3: 1921.45m EL=18.48m
 Change-4: 1658.80m EL=18.65m
 Change-5: 1681.80m EL=19.01m
 Change-6: 1359.14m EL=19.00m
 Change-7: 1488.16m EL=19.00m



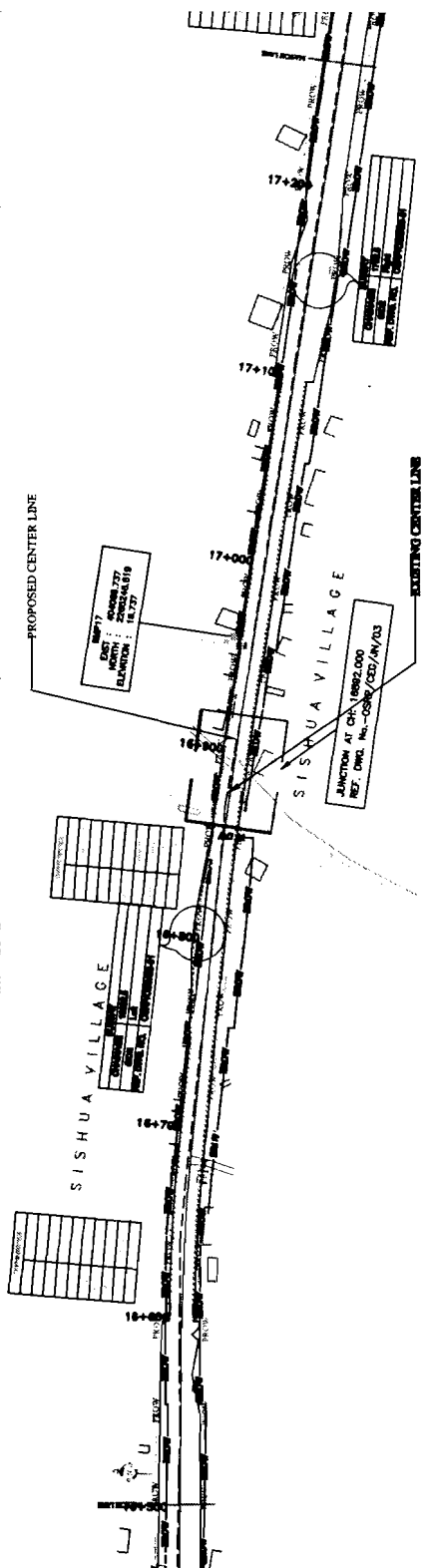
PROJECT:
 OISHA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE

CLIENT:
 OISHA STATE GOVT. OF OISHA

CONSULTANT:
 CONSULTING ENGINEERS LTD.
 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 CHANDBALI →

← TO JAGATPUR



CHAINAGE	DESIGN LEVELS	GROUND LEVELS	HORIZONTAL	VERTICAL	SUPERELEVATION
17300.00	17.00	17.00	0.00	0.00	0.00
17350.00	17.00	17.00	0.00	0.00	0.00
17400.00	17.00	17.00	0.00	0.00	0.00
17450.00	17.00	17.00	0.00	0.00	0.00
17500.00	17.00	17.00	0.00	0.00	0.00
17550.00	17.00	17.00	0.00	0.00	0.00
17600.00	17.00	17.00	0.00	0.00	0.00
17650.00	17.00	17.00	0.00	0.00	0.00
17700.00	17.00	17.00	0.00	0.00	0.00
17750.00	17.00	17.00	0.00	0.00	0.00
17800.00	17.00	17.00	0.00	0.00	0.00
17850.00	17.00	17.00	0.00	0.00	0.00
17900.00	17.00	17.00	0.00	0.00	0.00
17950.00	17.00	17.00	0.00	0.00	0.00
18000.00	17.00	17.00	0.00	0.00	0.00
18050.00	17.00	17.00	0.00	0.00	0.00
18100.00	17.00	17.00	0.00	0.00	0.00
18150.00	17.00	17.00	0.00	0.00	0.00
18200.00	17.00	17.00	0.00	0.00	0.00
18250.00	17.00	17.00	0.00	0.00	0.00
18300.00	17.00	17.00	0.00	0.00	0.00
18350.00	17.00	17.00	0.00	0.00	0.00
18400.00	17.00	17.00	0.00	0.00	0.00
18450.00	17.00	17.00	0.00	0.00	0.00
18500.00	17.00	17.00	0.00	0.00	0.00
18550.00	17.00	17.00	0.00	0.00	0.00
18600.00	17.00	17.00	0.00	0.00	0.00
18650.00	17.00	17.00	0.00	0.00	0.00
18700.00	17.00	17.00	0.00	0.00	0.00
18750.00	17.00	17.00	0.00	0.00	0.00
18800.00	17.00	17.00	0.00	0.00	0.00
18850.00	17.00	17.00	0.00	0.00	0.00
18900.00	17.00	17.00	0.00	0.00	0.00
18950.00	17.00	17.00	0.00	0.00	0.00
19000.00	17.00	17.00	0.00	0.00	0.00
19050.00	17.00	17.00	0.00	0.00	0.00
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19200.00	17.00	17.00	0.00	0.00	0.00
19250.00	17.00	17.00	0.00	0.00	0.00
19300.00	17.00	17.00	0.00	0.00	0.00
19350.00	17.00	17.00	0.00	0.00	0.00
19400.00	17.00	17.00	0.00	0.00	0.00
19450.00	17.00	17.00	0.00	0.00	0.00
19500.00	17.00	17.00	0.00	0.00	0.00
19550.00	17.00	17.00	0.00	0.00	0.00
19600.00	17.00	17.00	0.00	0.00	0.00
19650.00	17.00	17.00	0.00	0.00	0.00
19700.00	17.00	17.00	0.00	0.00	0.00
19750.00	17.00	17.00	0.00	0.00	0.00
19800.00	17.00	17.00	0.00	0.00	0.00
19850.00	17.00	17.00	0.00	0.00	0.00
19900.00	17.00	17.00	0.00	0.00	0.00
19950.00	17.00	17.00	0.00	0.00	0.00
20000.00	17.00	17.00	0.00	0.00	0.00

CHAINAGE	DESIGN LEVELS	GROUND LEVELS	HORIZONTAL	VERTICAL	SUPERELEVATION
17300.00	17.00	17.00	0.00	0.00	0.00
17350.00	17.00	17.00	0.00	0.00	0.00
17400.00	17.00	17.00	0.00	0.00	0.00
17450.00	17.00	17.00	0.00	0.00	0.00
17500.00	17.00	17.00	0.00	0.00	0.00
17550.00	17.00	17.00	0.00	0.00	0.00
17600.00	17.00	17.00	0.00	0.00	0.00
17650.00	17.00	17.00	0.00	0.00	0.00
17700.00	17.00	17.00	0.00	0.00	0.00
17750.00	17.00	17.00	0.00	0.00	0.00
17800.00	17.00	17.00	0.00	0.00	0.00
17850.00	17.00	17.00	0.00	0.00	0.00
17900.00	17.00	17.00	0.00	0.00	0.00
17950.00	17.00	17.00	0.00	0.00	0.00
18000.00	17.00	17.00	0.00	0.00	0.00
18050.00	17.00	17.00	0.00	0.00	0.00
18100.00	17.00	17.00	0.00	0.00	0.00
18150.00	17.00	17.00	0.00	0.00	0.00
18200.00	17.00	17.00	0.00	0.00	0.00
18250.00	17.00	17.00	0.00	0.00	0.00
18300.00	17.00	17.00	0.00	0.00	0.00
18350.00	17.00	17.00	0.00	0.00	0.00
18400.00	17.00	17.00	0.00	0.00	0.00
18450.00	17.00	17.00	0.00	0.00	0.00
18500.00	17.00	17.00	0.00	0.00	0.00
18550.00	17.00	17.00	0.00	0.00	0.00
18600.00	17.00	17.00	0.00	0.00	0.00
18650.00	17.00	17.00	0.00	0.00	0.00
18700.00	17.00	17.00	0.00	0.00	0.00
18750.00	17.00	17.00	0.00	0.00	0.00
18800.00	17.00	17.00	0.00	0.00	0.00
18850.00	17.00	17.00	0.00	0.00	0.00
18900.00	17.00	17.00	0.00	0.00	0.00
18950.00	17.00	17.00	0.00	0.00	0.00
19000.00	17.00	17.00	0.00	0.00	0.00
19050.00	17.00	17.00	0.00	0.00	0.00
19100.00	17.00	17.00	0.00	0.00	0.00
19150.00	17.00	17.00	0.00	0.00	0.00
19200.00	17.00	17.00	0.00	0.00	0.00
19250.00	17.00	17.00	0.00	0.00	0.00
19300.00	17.00	17.00	0.00	0.00	0.00
19350.00	17.00	17.00	0.00	0.00	0.00
19400.00	17.00	17.00	0.00	0.00	0.00
19450.00	17.00	17.00	0.00	0.00	0.00
19500.00	17.00	17.00	0.00	0.00	0.00
19550.00	17.00	17.00	0.00	0.00	0.00
19600.00	17.00	17.00	0.00	0.00	0.00
19650.00	17.00	17.00	0.00	0.00	0.00
19700.00	17.00	17.00	0.00	0.00	0.00
19750.00	17.00	17.00	0.00	0.00	0.00
19800.00	17.00	17.00	0.00	0.00	0.00
19850.00	17.00	17.00	0.00	0.00	0.00
19900.00	17.00	17.00	0.00	0.00	0.00
19950.00	17.00	17.00	0.00	0.00	0.00
20000.00	17.00	17.00	0.00	0.00	0.00



VALECHA ENGINEERING LTD
Contractor

[Handwritten Signature]

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

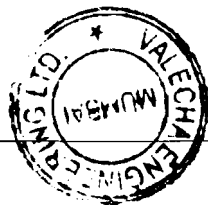
PROJECT:
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

CLIENT:
WORKS DEPT.
GOVT. OF ODISHA

CONSULTANT:
CONSULTING ENGINEERS
MUMBAI

**WIDENING AND STRENGTHENING TO TWO LANE
PLAN AND LONGITUDINAL SECTION
JAGATPUR TO DILHARA Km.18000 TO Km.17250**

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Date: 10/11/2011
Sheet No: 10/11/2011/1000/1000

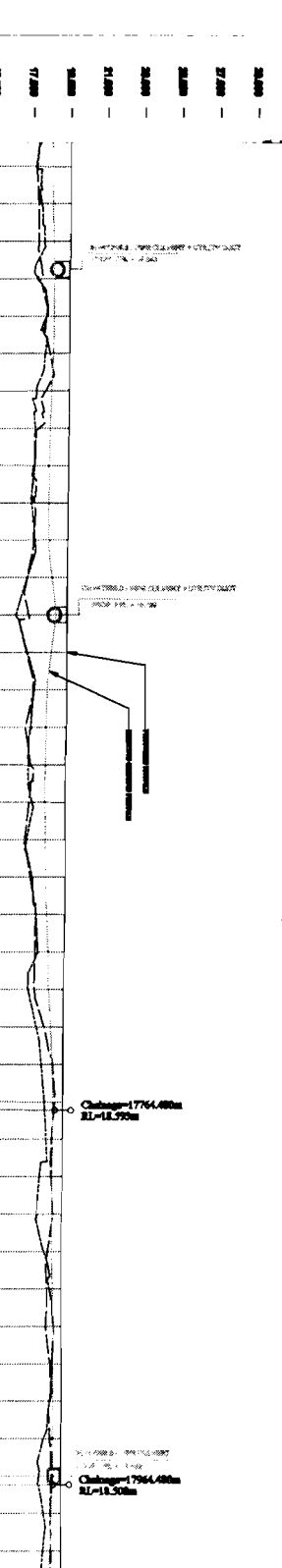
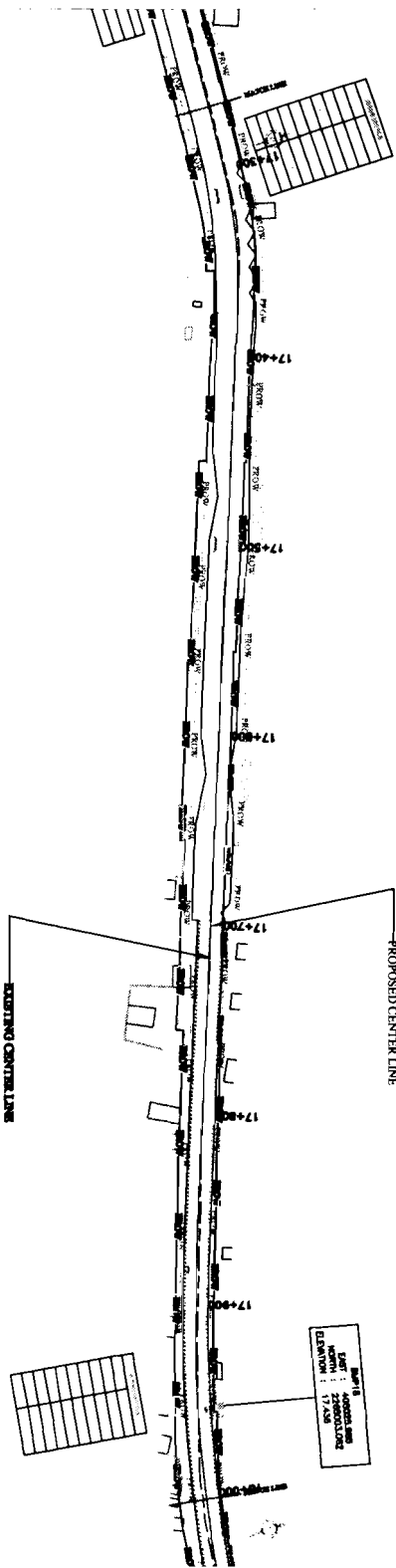


VALECHA ENGINEERING LTD.
Contractor

Bhubaneswar.
On the E.I.C.(Civil), Odisha
World Bank Project
Road Bank Project
Civil Engineer

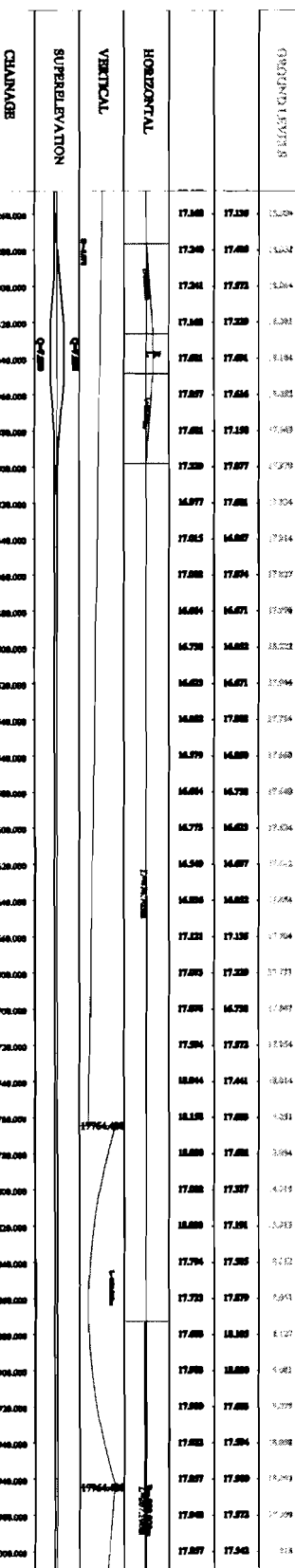
TO JAGATPUR

TO CHANDBALI



DATUM = 11.000

STATION	GROUND LEVEL	DESIGN LEVEL
17+000	18.986	18.986
17+010	18.971	18.971
17+020	18.955	18.955
17+030	18.940	18.940
17+040	18.924	18.924
17+050	18.908	18.908
17+060	18.892	18.892
17+070	18.876	18.876
17+080	18.860	18.860
17+090	18.844	18.844
17+100	18.828	18.828
17+110	18.812	18.812
17+120	18.796	18.796
17+130	18.780	18.780
17+140	18.764	18.764
17+150	18.748	18.748
17+160	18.732	18.732
17+170	18.716	18.716
17+180	18.700	18.700
17+190	18.684	18.684
17+200	18.668	18.668
17+210	18.652	18.652
17+220	18.636	18.636
17+230	18.620	18.620
17+240	18.604	18.604
17+250	18.588	18.588
17+260	18.572	18.572
17+270	18.556	18.556
17+280	18.540	18.540
17+290	18.524	18.524
17+300	18.508	18.508
17+310	18.492	18.492
17+320	18.476	18.476
17+330	18.460	18.460
17+340	18.444	18.444
17+350	18.428	18.428
17+360	18.412	18.412
17+370	18.396	18.396
17+380	18.380	18.380
17+390	18.364	18.364
17+400	18.348	18.348



Legend

PROJECT
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

CLIENT
WORLD BERT.
GOVT. OF ODISHA

CONSULTANT
C O M S U L T I N G
ENGINEERING & ARCHITECTURE
PVT. LTD.
227/79C, 4th floor, Chandbali, Bhubaneswar

**WORKING AND STRENGTHENING TO TWO LANE
PLAN AND LONGITUDINAL SECTION
JAGATPUR TO CHANDBALI KM.172870 TO KM.18000**

NO.	DATE	REVISION	BY	CHKD.
1	17/01/2017	ISSUED FOR TENDER		
2	17/02/2017	REVISED		
3	17/03/2017	REVISED		
4	17/04/2017	REVISED		
5	17/05/2017	REVISED		
6	17/06/2017	REVISED		
7	17/07/2017	REVISED		
8	17/08/2017	REVISED		
9	17/09/2017	REVISED		
10	17/10/2017	REVISED		
11	17/11/2017	REVISED		
12	17/12/2017	REVISED		
13	18/01/2018	REVISED		
14	18/02/2018	REVISED		
15	18/03/2018	REVISED		
16	18/04/2018	REVISED		
17	18/05/2018	REVISED		
18	18/06/2018	REVISED		
19	18/07/2018	REVISED		
20	18/08/2018	REVISED		
21	18/09/2018	REVISED		
22	18/10/2018	REVISED		
23	18/11/2018	REVISED		
24	18/12/2018	REVISED		
25	19/01/2019	REVISED		
26	19/02/2019	REVISED		
27	19/03/2019	REVISED		
28	19/04/2019	REVISED		
29	19/05/2019	REVISED		
30	19/06/2019	REVISED		
31	19/07/2019	REVISED		
32	19/08/2019	REVISED		
33	19/09/2019	REVISED		
34	19/10/2019	REVISED		
35	19/11/2019	REVISED		
36	19/12/2019	REVISED		
37	20/01/2020	REVISED		
38	20/02/2020	REVISED		
39	20/03/2020	REVISED		
40	20/04/2020	REVISED		
41	20/05/2020	REVISED		
42	20/06/2020	REVISED		
43	20/07/2020	REVISED		
44	20/08/2020	REVISED		
45	20/09/2020	REVISED		
46	20/10/2020	REVISED		
47	20/11/2020	REVISED		
48	20/12/2020	REVISED		
49	21/01/2021	REVISED		
50	21/02/2021	REVISED		
51	21/03/2021	REVISED		
52	21/04/2021	REVISED		
53	21/05/2021	REVISED		
54	21/06/2021	REVISED		
55	21/07/2021	REVISED		
56	21/08/2021	REVISED		
57	21/09/2021	REVISED		
58	21/10/2021	REVISED		
59	21/11/2021	REVISED		
60	21/12/2021	REVISED		
61	22/01/2022	REVISED		
62	22/02/2022	REVISED		
63	22/03/2022	REVISED		
64	22/04/2022	REVISED		
65	22/05/2022	REVISED		
66	22/06/2022	REVISED		
67	22/07/2022	REVISED		
68	22/08/2022	REVISED		
69	22/09/2022	REVISED		
70	22/10/2022	REVISED		
71	22/11/2022	REVISED		
72	22/12/2022	REVISED		
73	23/01/2023	REVISED		
74	23/02/2023	REVISED		
75	23/03/2023	REVISED		
76	23/04/2023	REVISED		
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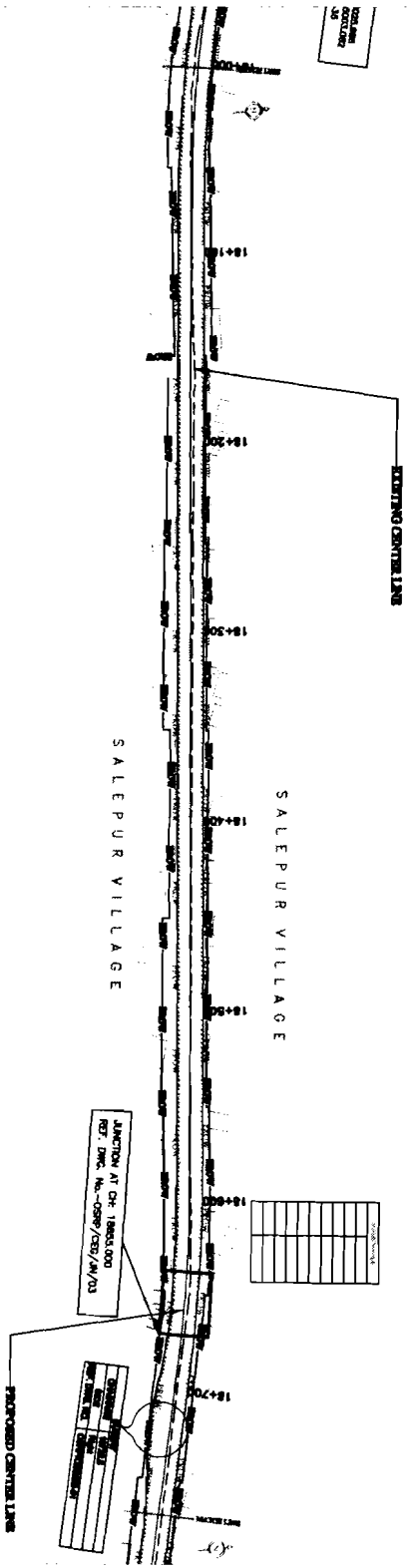


VALECHA ENGINEERING LTD.
Contractor

Chief Engineer
WORLD BANK PROJECT
D-10 the E.H.C.(Civil),
Rudhreswar,

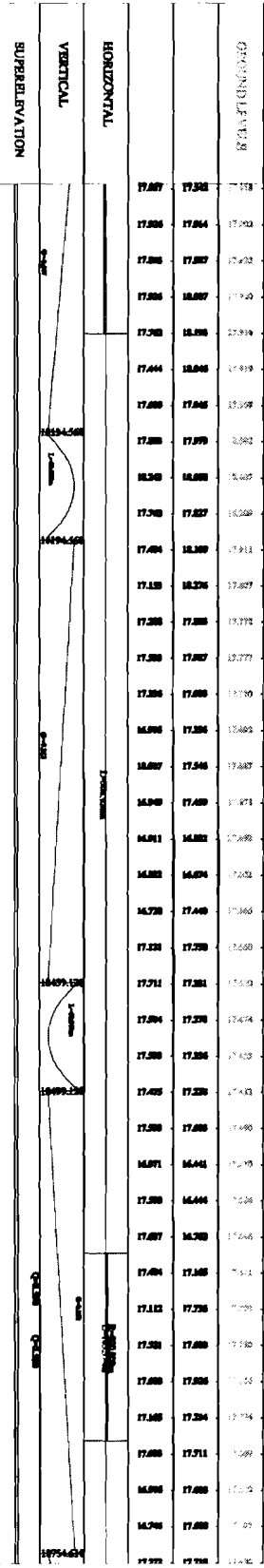
TO JAGATPUR

TO CHANDBALI



DESIGN LEVELS
DATUM = 11.000

CH	GL	DL	GL
18000	18.585	18.585	18.585
18010	18.584	18.584	18.584
18020	18.583	18.583	18.583
18030	18.582	18.582	18.582
18040	18.581	18.581	18.581
18050	18.580	18.580	18.580
18060	18.579	18.579	18.579
18070	18.578	18.578	18.578
18080	18.577	18.577	18.577
18090	18.576	18.576	18.576
18100	18.575	18.575	18.575
18110	18.574	18.574	18.574
18120	18.573	18.573	18.573
18130	18.572	18.572	18.572
18140	18.571	18.571	18.571
18150	18.570	18.570	18.570
18160	18.569	18.569	18.569
18170	18.568	18.568	18.568
18180	18.567	18.567	18.567
18190	18.566	18.566	18.566
18200	18.565	18.565	18.565
18210	18.564	18.564	18.564
18220	18.563	18.563	18.563
18230	18.562	18.562	18.562
18240	18.561	18.561	18.561
18250	18.560	18.560	18.560
18260	18.559	18.559	18.559
18270	18.558	18.558	18.558
18280	18.557	18.557	18.557
18290	18.556	18.556	18.556
18300	18.555	18.555	18.555
18310	18.554	18.554	18.554
18320	18.553	18.553	18.553
18330	18.552	18.552	18.552
18340	18.551	18.551	18.551
18350	18.550	18.550	18.550
18360	18.549	18.549	18.549
18370	18.548	18.548	18.548
18380	18.547	18.547	18.547
18390	18.546	18.546	18.546
18400	18.545	18.545	18.545
18410	18.544	18.544	18.544
18420	18.543	18.543	18.543
18430	18.542	18.542	18.542
18440	18.541	18.541	18.541
18450	18.540	18.540	18.540
18460	18.539	18.539	18.539
18470	18.538	18.538	18.538
18480	18.537	18.537	18.537
18490	18.536	18.536	18.536
18500	18.535	18.535	18.535
18510	18.534	18.534	18.534
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18530	18.532	18.532	18.532
18540	18.531	18.531	18.531
18550	18.530	18.530	18.530
18560	18.529	18.529	18.529
18570	18.528	18.528	18.528
18580	18.527	18.527	18.527
18590	18.526	18.526	18.526
18600	18.525	18.525	18.525
18610	18.524	18.524	18.524
18620	18.523	18.523	18.523
18630	18.522	18.522	18.522
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18650	18.520	18.520	18.520
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18730	18.512	18.512	18.512
18740	18.511	18.511	18.511
18750	18.510	18.510	18.510
18760	18.509	18.509	18.509
18770	18.508	18.508	18.508
18780	18.507	18.507	18.507
18790	18.506	18.506	18.506
18800	18.505	18.505	18.505
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18850	18.500	18.500	18.500
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18870	18.498	18.498	18.498
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18890	18.496	18.496	18.496
18900	18.495	18.495	18.495
18910	18.494	18.494	18.494
18920	18.493	18.493	18.493
18930	18.492	18.492	18.492
18940	18.491	18.491	18.491
18950	18.490	18.490	18.490
18960	18.489	18.489	18.489
18970	18.488	18.488	18.488
18980	18.487	18.487	18.487
18990	18.486	18.486	18.486
19000	18.485	18.485	18.485



PROJECT: CANAL WATER BOND PROJECT
UNDER WORLD BANK ASSISTANCE

CLIENT: WORKS DEPT., GOVT. OF GUJARAT

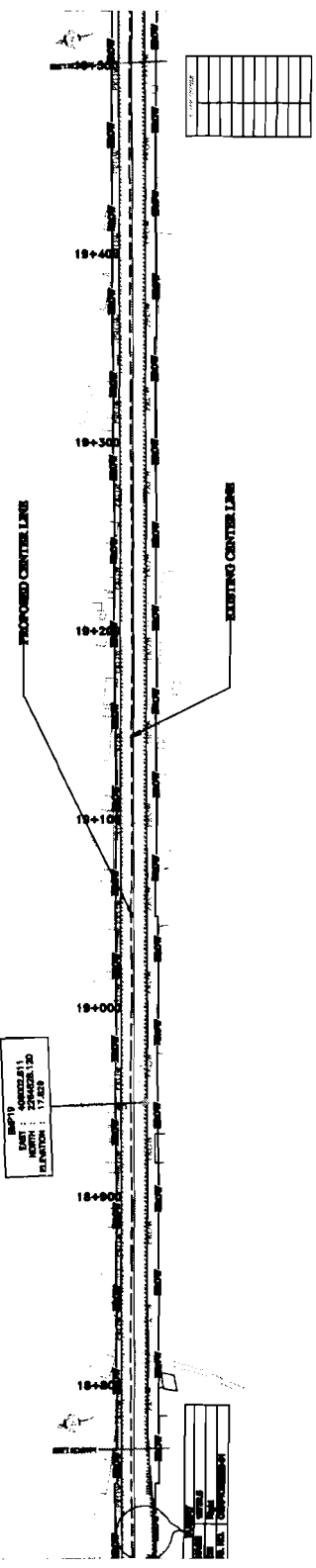
CONSULTANT: COMBUSTION ENGINEERING & SUPPLY LTD.
BANGALORE, INDIA

WORKING AND STRENGTHENING TO TWO LANE
PLAN AND LONGITUDINAL SECTION
JAGATPUR TO CHANDBALI NH-180/010 NH-187/0

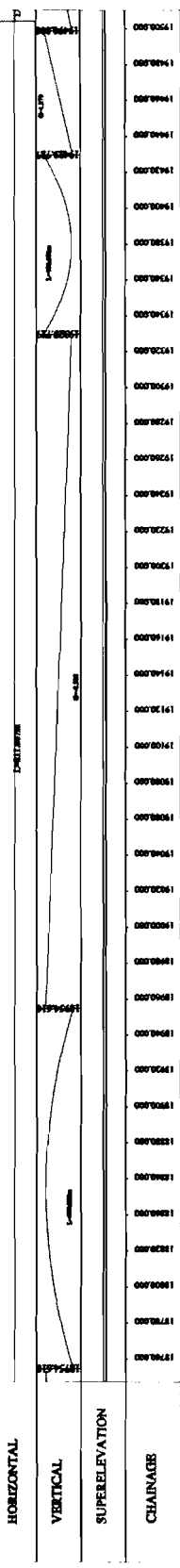
NO.	DATE	BY	CHKD.	APPD.
1	18/01/03	...	...	...
2
3
4
5
6
7
8
9
10

TO CHANDBALI →

← TO JAGATPUR



CHAINAGE	DESIGN LEVELS	GROUND LEVELS	HORIZONTAL	VERTICAL	SUPERELEVATION
18+00	18.000	18.000	18.000	18.000	0.000
18+05	18.000	18.000	18.000	18.000	0.000
18+10	18.000	18.000	18.000	18.000	0.000
18+15	18.000	18.000	18.000	18.000	0.000
18+20	18.000	18.000	18.000	18.000	0.000
18+25	18.000	18.000	18.000	18.000	0.000
18+30	18.000	18.000	18.000	18.000	0.000
18+35	18.000	18.000	18.000	18.000	0.000
18+40	18.000	18.000	18.000	18.000	0.000
18+45	18.000	18.000	18.000	18.000	0.000
18+50	18.000	18.000	18.000	18.000	0.000
18+55	18.000	18.000	18.000	18.000	0.000
18+60	18.000	18.000	18.000	18.000	0.000
18+65	18.000	18.000	18.000	18.000	0.000
18+70	18.000	18.000	18.000	18.000	0.000
18+75	18.000	18.000	18.000	18.000	0.000
18+80	18.000	18.000	18.000	18.000	0.000
18+85	18.000	18.000	18.000	18.000	0.000
18+90	18.000	18.000	18.000	18.000	0.000
18+95	18.000	18.000	18.000	18.000	0.000
19+00	18.000	18.000	18.000	18.000	0.000
19+05	18.000	18.000	18.000	18.000	0.000
19+10	18.000	18.000	18.000	18.000	0.000
19+15	18.000	18.000	18.000	18.000	0.000
19+20	18.000	18.000	18.000	18.000	0.000
19+25	18.000	18.000	18.000	18.000	0.000
19+30	18.000	18.000	18.000	18.000	0.000
19+35	18.000	18.000	18.000	18.000	0.000
19+40	18.000	18.000	18.000	18.000	0.000
19+45	18.000	18.000	18.000	18.000	0.000
19+50	18.000	18.000	18.000	18.000	0.000



CHAINAGE	DESIGN LEVELS	GROUND LEVELS	HORIZONTAL	VERTICAL	SUPERELEVATION
19+55	18.000	18.000	18.000	18.000	0.000
19+60	18.000	18.000	18.000	18.000	0.000
19+65	18.000	18.000	18.000	18.000	0.000
19+70	18.000	18.000	18.000	18.000	0.000
19+75	18.000	18.000	18.000	18.000	0.000
19+80	18.000	18.000	18.000	18.000	0.000
19+85	18.000	18.000	18.000	18.000	0.000
19+90	18.000	18.000	18.000	18.000	0.000
19+95	18.000	18.000	18.000	18.000	0.000
20+00	18.000	18.000	18.000	18.000	0.000
20+05	18.000	18.000	18.000	18.000	0.000
20+10	18.000	18.000	18.000	18.000	0.000
20+15	18.000	18.000	18.000	18.000	0.000
20+20	18.000	18.000	18.000	18.000	0.000
20+25	18.000	18.000	18.000	18.000	0.000
20+30	18.000	18.000	18.000	18.000	0.000
20+35	18.000	18.000	18.000	18.000	0.000
20+40	18.000	18.000	18.000	18.000	0.000
20+45	18.000	18.000	18.000	18.000	0.000
20+50	18.000	18.000	18.000	18.000	0.000

PROJECT:-
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

CLIENT:-
WORLD BANK
GOVT. OF ODISHA

CONSULTANT:-
COMBUSTION
CONSULTANTS ENGINEERS LTD.
12/341 Chandrabali, Nagar Jagatpur-75
Ph. 491-141-202899, 432 884 230008
Fax. 2023145, e-mail: combustion@rediffmail.com

WIDENING AND STRENGTHENING TO TWO LANE
PLAN AND LONGITUDINAL SECTION
JAGATPUR TO DULHURA Km.187/870 No.18/800

NO.	DATE	BY	CHKD.	APPD.
1	17.08.20			
2	17.08.20			
3	17.08.20			
4	17.08.20			
5	17.08.20			
6	17.08.20			
7	17.08.20			
8	17.08.20			
9	17.08.20			
10	17.08.20			

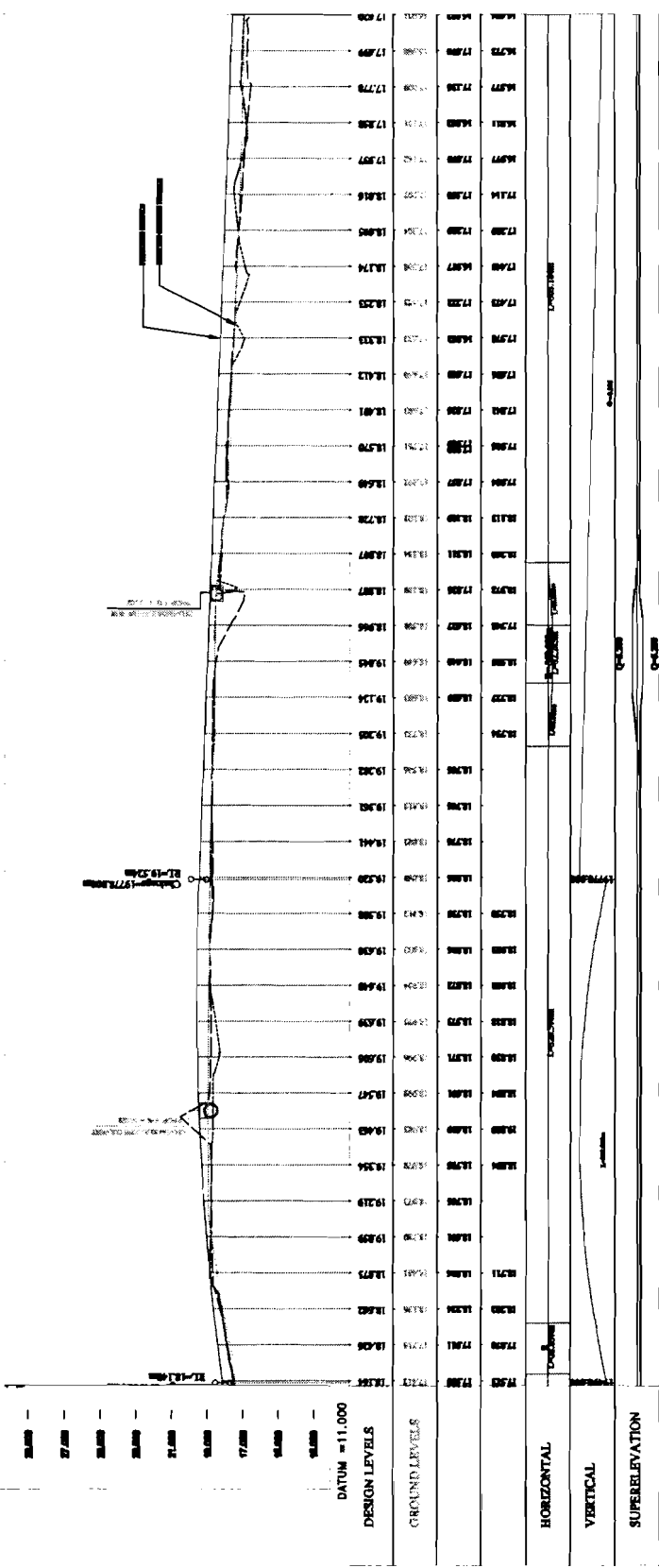
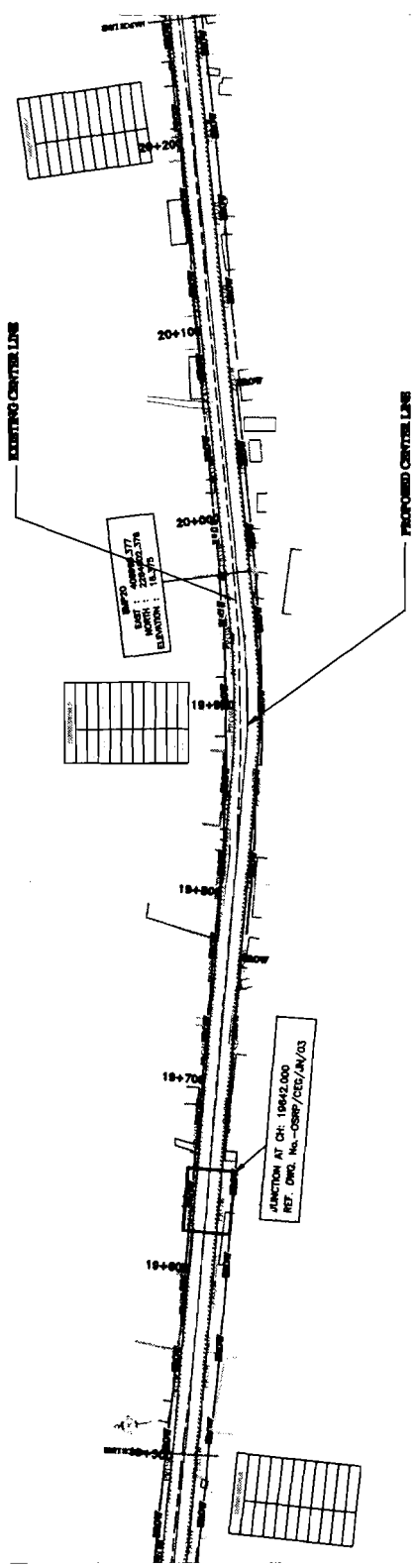


VALECHA ENGINEERING LTD.
Contractor

Chief Engineer,
World Bank Project
Go the E.I.C.(Civil), Odisha
Phubaneswar.

← TO JAGATPUR

TO CHANDBALI →



CHAINAGE	GROUND LEVEL	DESIGN LEVEL	VERTICAL CURVE DATA
17+00	17.00	17.00	
17+10	17.10	17.10	
17+20	17.20	17.20	
17+30	17.30	17.30	
17+40	17.40	17.40	
17+50	17.50	17.50	
17+60	17.60	17.60	
17+70	17.70	17.70	
17+80	17.80	17.80	
17+90	17.90	17.90	
18+00	18.00	18.00	
18+10	18.10	18.10	
18+20	18.20	18.20	
18+30	18.30	18.30	
18+40	18.40	18.40	
18+50	18.50	18.50	
18+60	18.60	18.60	
18+70	18.70	18.70	
18+80	18.80	18.80	
18+90	18.90	18.90	
19+00	19.00	19.00	
19+10	19.10	19.10	
19+20	19.20	19.20	
19+30	19.30	19.30	
19+40	19.40	19.40	
19+50	19.50	19.50	
19+60	19.60	19.60	
19+70	19.70	19.70	
19+80	19.80	19.80	
19+90	19.90	19.90	
20+00	20.00	20.00	

WIDENING AND STRENGTHENING TO TWO LANE PLAN AND LONGITUDINAL SECTION JAGATPUR TO DALUPA Km. 186/070 Km. 202/00

CONSULTANT: G.E. CONSULTING ENGINEERS
 11/34/1, COLLEGE ROAD, WEST BANGALORE-560075
 TEL: 491-1511-2200000 FAX: 2200000
 E-MAIL: gce@geconline.com

CLIENT: WORKS DEPT. GOVT. OF ODISHA

PROJECT: ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE

DATE: 18/08/2009

SCALE: 1:1000

PROJECT NO: 186/070

SECTION NO: 186/070/01

DATE OF ISSUE: 18/08/2009

DATE OF REVISION: 18/08/2009

REVISION: 1

REVISION: 2

REVISION: 3

REVISION: 4

REVISION: 5

REVISION: 6

REVISION: 7

REVISION: 8

REVISION: 9

REVISION: 10

REVISION: 11

REVISION: 12

REVISION: 13

REVISION: 14

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REVISION: 93

REVISION: 94

REVISION: 95

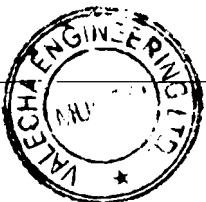
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REVISION: 97

REVISION: 98

REVISION: 99

REVISION: 100



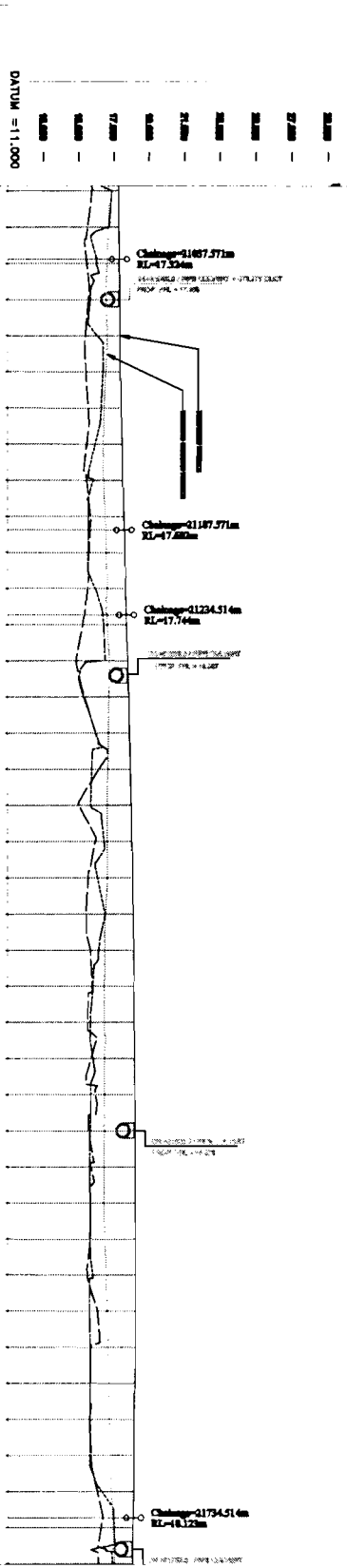
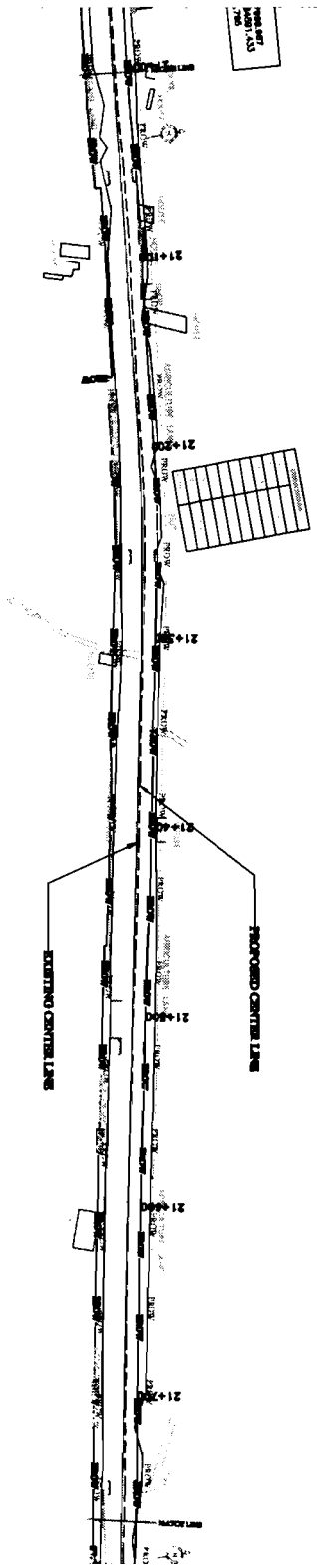


VALECHA ENGINEERING LTD
Contractor

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

TO JAGTIPUR

TO CHANDBALI



Station	Ground Level (m)	Design Level (m)
21+000	13.75	17.29
21+050	13.80	17.31
21+100	13.90	17.33
21+150	14.00	17.35
21+200	14.10	17.37
21+250	14.20	17.39
21+300	14.30	17.41
21+350	14.40	17.43
21+400	14.50	17.45
21+450	14.60	17.47
21+500	14.70	17.49
21+550	14.80	17.51
21+600	14.90	17.53
21+650	15.00	17.55
21+700	15.10	17.57
21+750	15.20	17.59
21+800	15.30	17.61
21+850	15.40	17.63
21+900	15.50	17.65
21+950	15.60	17.67
22+000	15.70	17.69
22+050	15.80	17.71
22+100	15.90	17.73
22+150	16.00	17.75
22+200	16.10	17.77
22+250	16.20	17.79
22+300	16.30	17.81
22+350	16.40	17.83
22+400	16.50	17.85
22+450	16.60	17.87
22+500	16.70	17.89
22+550	16.80	17.91
22+600	16.90	17.93
22+650	17.00	17.95
22+700	17.10	17.97
22+750	17.20	17.99
22+800	17.30	18.01
22+850	17.40	18.03
22+900	17.50	18.05
22+950	17.60	18.07
23+000	17.70	18.09
23+050	17.80	18.11
23+100	17.90	18.13
23+150	18.00	18.15
23+200	18.10	18.17
23+250	18.20	18.19
23+300	18.30	18.21
23+350	18.40	18.23
23+400	18.50	18.25
23+450	18.60	18.27
23+500	18.70	18.29
23+550	18.80	18.31
23+600	18.90	18.33
23+650	19.00	18.35
23+700	19.10	18.37
23+750	19.20	18.39
23+800	19.30	18.41
23+850	19.40	18.43
23+900	19.50	18.45
23+950	19.60	18.47
24+000	19.70	18.49

LEGEND

CHANGES

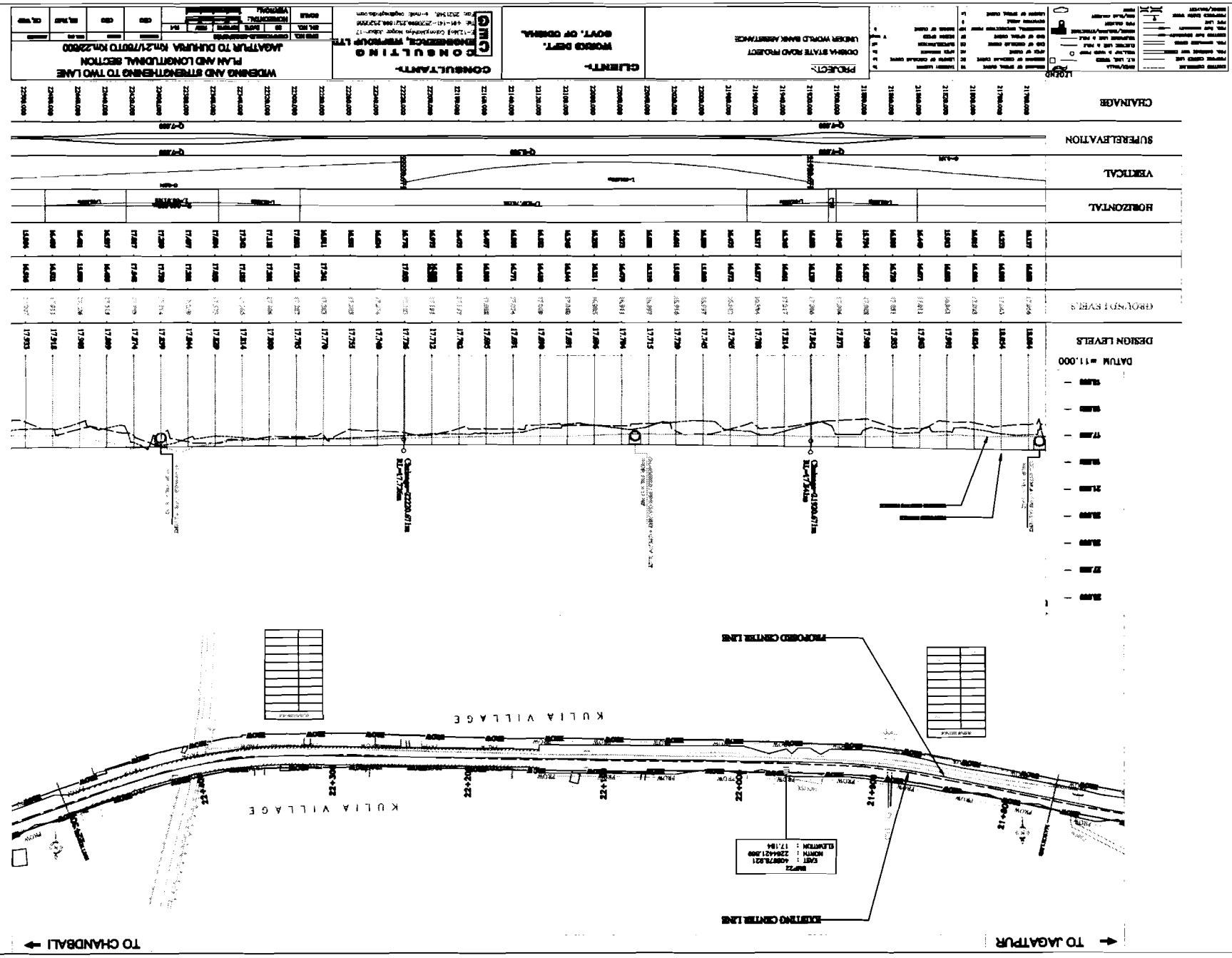
PROJECT: ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE

CLIENT: WORKS DEPT., GOVT., OF ODISHA.

CONSULTANT: CONSULTING ENGINEERS LTD. (C.E.L.)

WIDENING AND STRENGTHENING TO TWO LANE PLAN AND LONGITUDINAL SECTION JAGTIPUR TO CHANDBALI (Km. 21/750)

NO.	DATE	DESCRIPTION	BY	CHKD.
1	20/11/2018	ISSUED FOR TENDER
2	21/11/2018
3	22/11/2018
4	23/11/2018
5	24/11/2018
6	25/11/2018
7	26/11/2018
8	27/11/2018
9	28/11/2018
10	29/11/2018
11	30/11/2018
12	01/12/2018
13	02/12/2018
14	03/12/2018
15	04/12/2018
16	05/12/2018
17	06/12/2018
18	07/12/2018
19	08/12/2018
20	09/12/2018
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38	27/12/2018
39	28/12/2018
40	29/12/2018
41	30/12/2018
42	31/12/2018
43	01/01/2019
44	02/01/2019
45	03/01/2019
46	04/01/2019
47	05/01/2019
48	06/01/2019
49	07/01/2019
50	08/01/2019
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53	11/01/2019
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67	25/01/2019
68	26/01/2019
69	27/01/2019
70	28/01/2019
71	29/01/2019
72	30/01/2019
73	31/01/2019
74	01/02/2019
75	02/02/2019
76	03/02/2019
77	04/02/2019
78	05/02/2019
79	06/02/2019
80	07/02/2019
81	08/02/2019
82	09/02/2019
83	10/02/2019
84	11/02/2019
85	12/02/2019
86	13/02/2019
87	14/02/2019
88	15/02/2019
89	16/02/2019
90	17/02/2019
91	18/02/2019
92	19/02/2019
93	20/02/2019
94	21/02/2019
95	22/02/2019
96	23/02/2019
97	24/02/2019
98	25/02/2019
99	26/02/2019
100	27/02/2019



← TO CHANDBALI

→ TO JAGTAPUR

PROJECT: UNDER WORLD BANK ASSISTANCE
ODISHA STATE ROAD PROJECT

CLIENT: WORKS DEPT. GOVT. OF ODISHA

CONSULTANT: GRT CONSULTANTS ENGINEERING, WORKSHOP LTD.
GRT CONSULTANTS ENGINEERING, WORKSHOP LTD.
Plot No. 13403, Connaught Place, Sector 13, Gurgaon - 122001
Phone: 011-47101111, 47101112, 47101113, 47101114, 47101115, 47101116, 47101117, 47101118, 47101119, 47101120, 47101121, 47101122, 47101123, 47101124, 47101125, 47101126, 47101127, 47101128, 47101129, 47101130, 47101131, 47101132, 47101133, 47101134, 47101135, 47101136, 47101137, 47101138, 47101139, 47101140, 47101141, 47101142, 47101143, 47101144, 47101145, 47101146, 47101147, 47101148, 47101149, 47101150, 47101151, 47101152, 47101153, 47101154, 47101155, 47101156, 47101157, 47101158, 47101159, 47101160, 47101161, 47101162, 47101163, 47101164, 47101165, 47101166, 47101167, 47101168, 47101169, 47101170, 47101171, 47101172, 47101173, 47101174, 47101175, 47101176, 47101177, 47101178, 47101179, 47101180, 47101181, 47101182, 47101183, 47101184, 47101185, 47101186, 47101187, 47101188, 47101189, 47101190, 47101191, 47101192, 47101193, 47101194, 47101195, 47101196, 47101197, 47101198, 47101199, 47101200

WIDENING AND STRENGTHENING TO TWO LANE PLAN AND LONGITUDINAL SECTION JAGTIPUR TO DURLA, NH-229/007 TO NH-22/250

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

DATE: 20/08/2010

PROJECT NO.: NH-229/007 TO NH-22/250

SECTION NO.: 10

NO. OF SHEETS: 10

SHEET NO.: 10

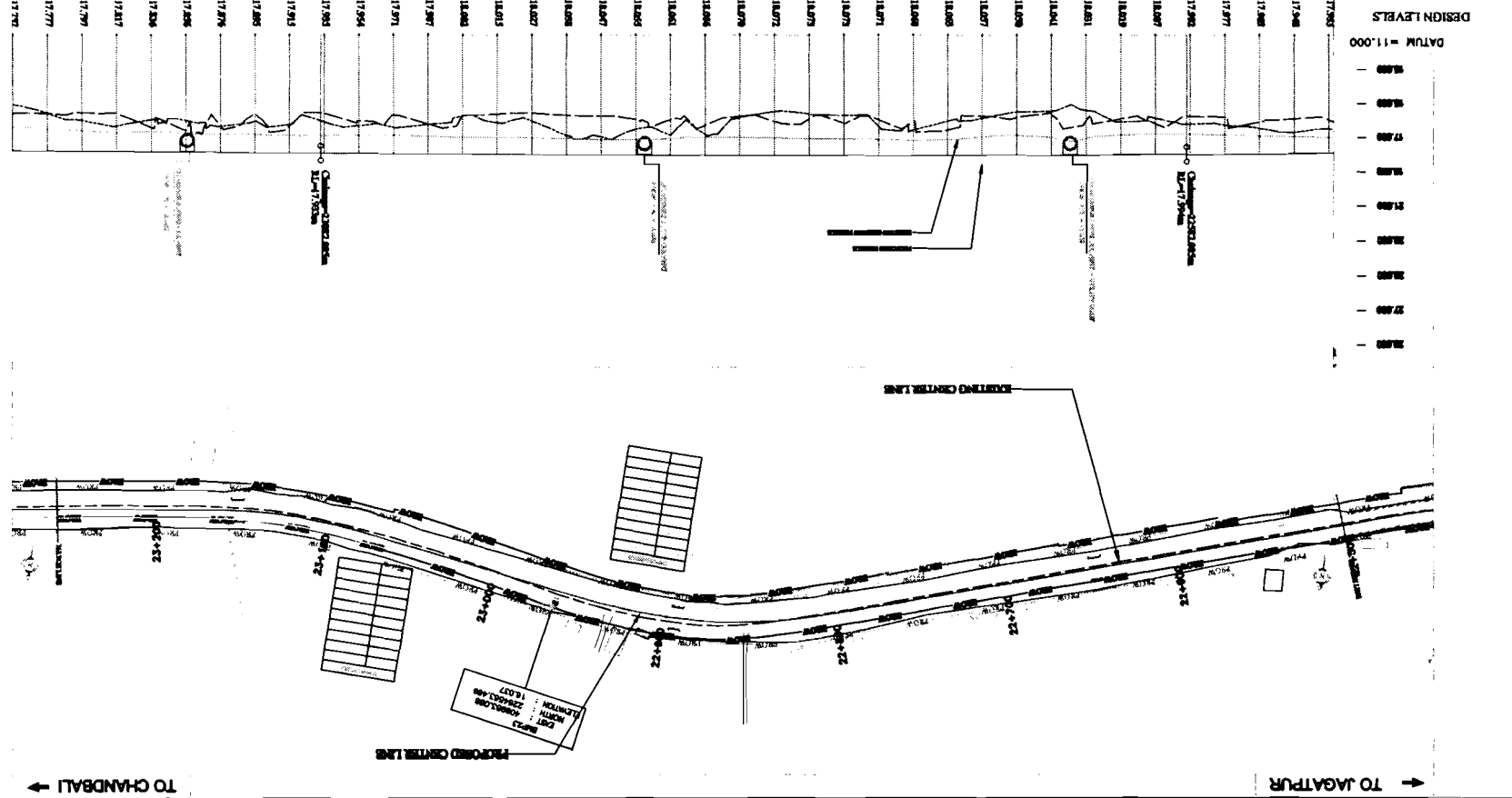
DATE OF ISSUE: 20/08/2010

DESIGNED BY: [Signature]

CHECKED BY: [Signature]

APPROVED BY: [Signature]

CHAINAGE	SUPERELEVATION	VERTICAL	HORIZONTAL	GROUND LEVELS	DESIGN LEVELS
229+000				17.957	17.785
229+020				18.000	17.800
229+040				18.043	17.815
229+060				18.086	17.830
229+080				18.129	17.845
229+100				18.172	17.860
229+120				18.215	17.875
229+140				18.258	17.890
229+160				18.301	17.905
229+180				18.344	17.920
229+200				18.387	17.935
229+220				18.430	17.950
229+240				18.473	17.965
229+260				18.516	17.980
229+280				18.559	17.995
229+300				18.602	18.010
229+320				18.645	18.025
229+340				18.688	18.040
229+360				18.731	18.055
229+380				18.774	18.070
229+400				18.817	18.085
229+420				18.860	18.100
229+440				18.903	18.115
229+460				18.946	18.130
229+480				18.989	18.145
229+500				19.032	18.160
229+520				19.075	18.175
229+540				19.118	18.190
229+560				19.161	18.205
229+580				19.204	18.220
229+600				19.247	18.235
229+620				19.290	18.250
229+640				19.333	18.265
229+660				19.376	18.280
229+680				19.419	18.295
229+700				19.462	18.310
229+720				19.505	18.325
229+740				19.548	18.340
229+760				19.591	18.355
229+780				19.634	18.370
229+800				19.677	18.385
229+820				19.720	18.400
229+840				19.763	18.415
229+860				19.806	18.430
229+880				19.849	18.445
229+900				19.892	18.460
229+920				19.935	18.475
229+940				19.978	18.490
229+960				20.021	18.505
229+980				20.064	18.520
230+000				20.107	18.535

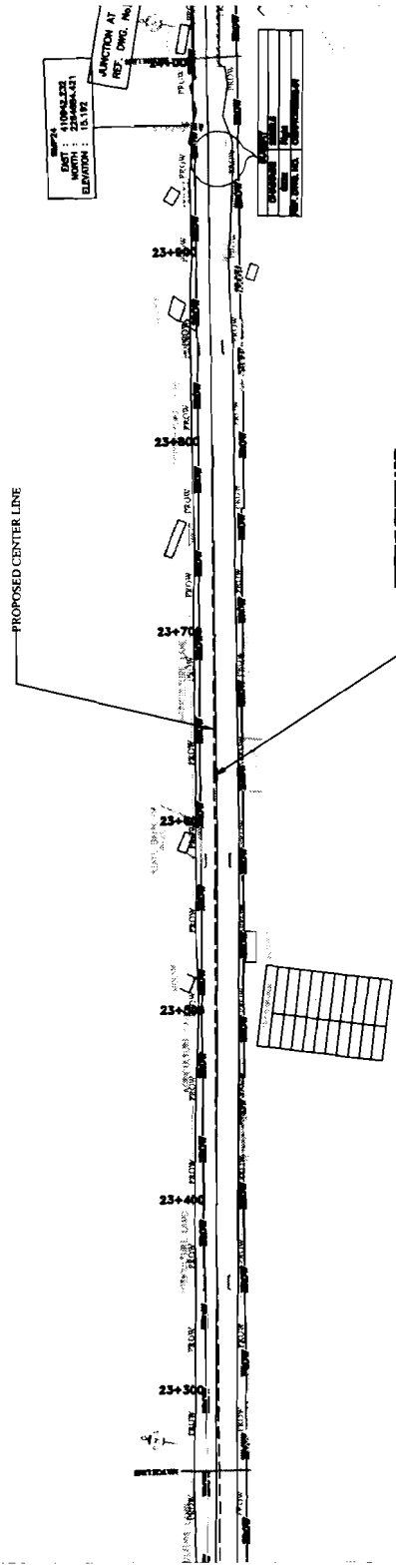


VALECHA ENGINEERING LTD.
Contractor

Chief Engineer,
Road & Transport
World Bank Project
JICA (the E.C.(Civil), Odisha
Bhubaneswar.

TO CHANDBALU →

← TO JAGATPUR



CHANGAGE	HORIZONTAL		VERTICAL		SUPERELEVATION	
	Station	Level	Station	Level	Station	Level
1334.000	17.777	12.80	17.777	12.80	17.777	12.80
1335.000	17.780	12.80	17.780	12.80	17.780	12.80
1336.000	17.783	12.80	17.783	12.80	17.783	12.80
1337.000	17.786	12.80	17.786	12.80	17.786	12.80
1338.000	17.789	12.80	17.789	12.80	17.789	12.80
1339.000	17.792	12.80	17.792	12.80	17.792	12.80
1340.000	17.795	12.80	17.795	12.80	17.795	12.80
1341.000	17.798	12.80	17.798	12.80	17.798	12.80
1342.000	17.801	12.80	17.801	12.80	17.801	12.80
1343.000	17.804	12.80	17.804	12.80	17.804	12.80
1344.000	17.807	12.80	17.807	12.80	17.807	12.80
1345.000	17.810	12.80	17.810	12.80	17.810	12.80
1346.000	17.813	12.80	17.813	12.80	17.813	12.80
1347.000	17.816	12.80	17.816	12.80	17.816	12.80
1348.000	17.819	12.80	17.819	12.80	17.819	12.80
1349.000	17.822	12.80	17.822	12.80	17.822	12.80
1350.000	17.825	12.80	17.825	12.80	17.825	12.80
1351.000	17.828	12.80	17.828	12.80	17.828	12.80
1352.000	17.831	12.80	17.831	12.80	17.831	12.80
1353.000	17.834	12.80	17.834	12.80	17.834	12.80
1354.000	17.837	12.80	17.837	12.80	17.837	12.80
1355.000	17.840	12.80	17.840	12.80	17.840	12.80
1356.000	17.843	12.80	17.843	12.80	17.843	12.80
1357.000	17.846	12.80	17.846	12.80	17.846	12.80
1358.000	17.849	12.80	17.849	12.80	17.849	12.80
1359.000	17.852	12.80	17.852	12.80	17.852	12.80
1360.000	17.855	12.80	17.855	12.80	17.855	12.80
1361.000	17.858	12.80	17.858	12.80	17.858	12.80
1362.000	17.861	12.80	17.861	12.80	17.861	12.80
1363.000	17.864	12.80	17.864	12.80	17.864	12.80
1364.000	17.867	12.80	17.867	12.80	17.867	12.80
1365.000	17.870	12.80	17.870	12.80	17.870	12.80
1366.000	17.873	12.80	17.873	12.80	17.873	12.80
1367.000	17.876	12.80	17.876	12.80	17.876	12.80
1368.000	17.879	12.80	17.879	12.80	17.879	12.80
1369.000	17.882	12.80	17.882	12.80	17.882	12.80
1370.000	17.885	12.80	17.885	12.80	17.885	12.80
1371.000	17.888	12.80	17.888	12.80	17.888	12.80
1372.000	17.891	12.80	17.891	12.80	17.891	12.80
1373.000	17.894	12.80	17.894	12.80	17.894	12.80
1374.000	17.897	12.80	17.897	12.80	17.897	12.80
1375.000	17.900	12.80	17.900	12.80	17.900	12.80
1376.000	17.903	12.80	17.903	12.80	17.903	12.80
1377.000	17.906	12.80	17.906	12.80	17.906	12.80
1378.000	17.909	12.80	17.909	12.80	17.909	12.80
1379.000	17.912	12.80	17.912	12.80	17.912	12.80
1380.000	17.915	12.80	17.915	12.80	17.915	12.80
1381.000	17.918	12.80	17.918	12.80	17.918	12.80
1382.000	17.921	12.80	17.921	12.80	17.921	12.80
1383.000	17.924	12.80	17.924	12.80	17.924	12.80
1384.000	17.927	12.80	17.927	12.80	17.927	12.80
1385.000	17.930	12.80	17.930	12.80	17.930	12.80
1386.000	17.933	12.80	17.933	12.80	17.933	12.80
1387.000	17.936	12.80	17.936	12.80	17.936	12.80
1388.000	17.939	12.80	17.939	12.80	17.939	12.80
1389.000	17.942	12.80	17.942	12.80	17.942	12.80
1390.000	17.945	12.80	17.945	12.80	17.945	12.80
1391.000	17.948	12.80	17.948	12.80	17.948	12.80
1392.000	17.951	12.80	17.951	12.80	17.951	12.80
1393.000	17.954	12.80	17.954	12.80	17.954	12.80
1394.000	17.957	12.80	17.957	12.80	17.957	12.80
1395.000	17.960	12.80	17.960	12.80	17.960	12.80
1396.000	17.963	12.80	17.963	12.80	17.963	12.80
1397.000	17.966	12.80	17.966	12.80	17.966	12.80
1398.000	17.969	12.80	17.969	12.80	17.969	12.80
1399.000	17.972	12.80	17.972	12.80	17.972	12.80
1400.000	17.975	12.80	17.975	12.80	17.975	12.80

WIDENING AND STRENGTHENING TO TWO LANE PLAN AND LONGITUDINAL SECTION
JAGATPUR TO DANAJURA Km.29250 TO Km.34000

CONSULTANT:
VALECHA ENGINEERING LTD.
 15/24/1 Commercial, Mohor Asha-17
 Ph: 9914112209, 9331063209
 Fax: 9914112209, 9331063209
 E-mail: valecha@rediffmail.com

CLIENT:
INDIAN RAILWAYS
GOVT. OF ODISHA

PROJECT:
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

DATE: 15/08/2017

SCALE: 1:1000

DESIGNER: [Signature]

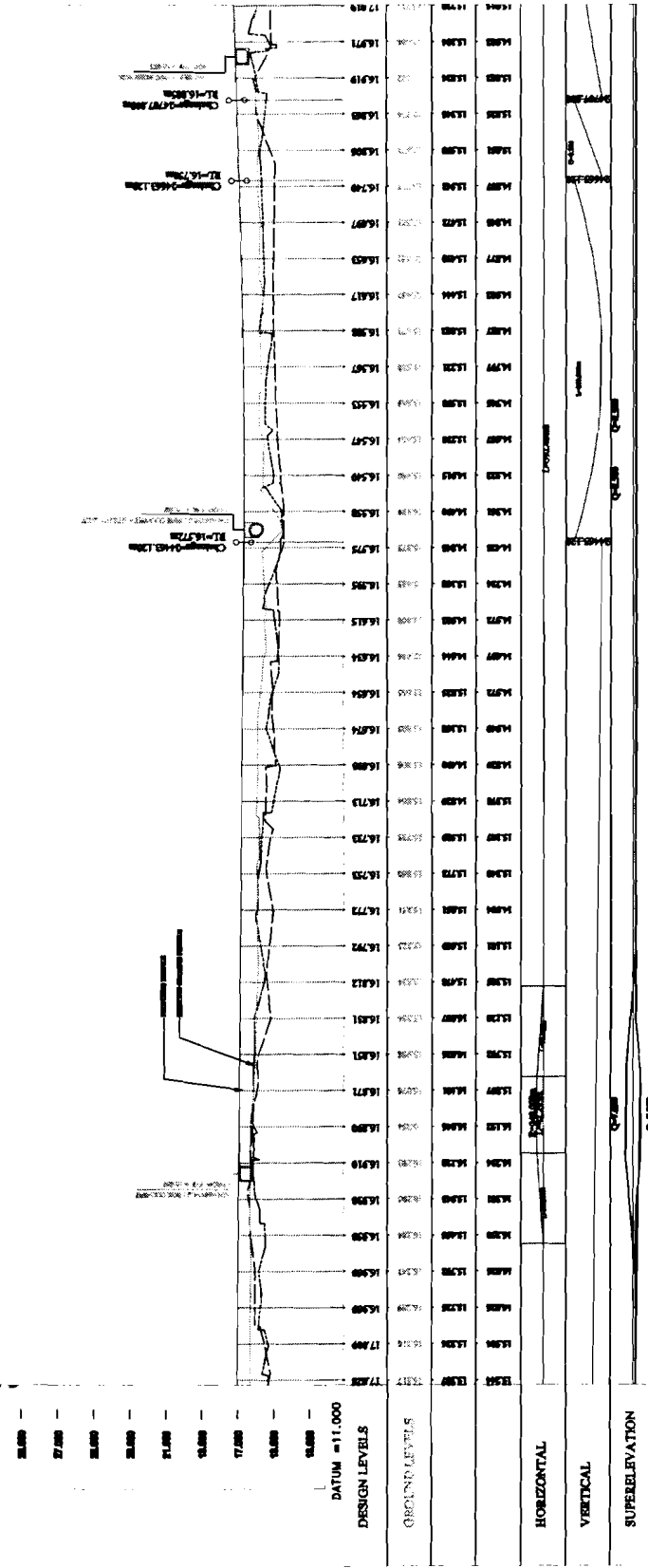
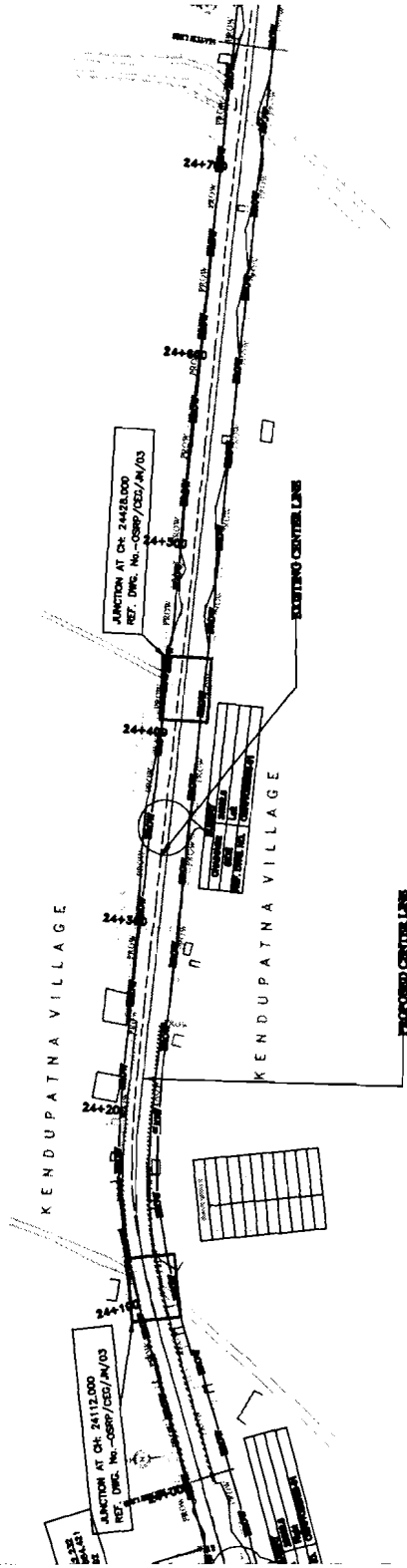
CHECKER: [Signature]

APPROVED: [Signature]



TO CHANDBALI →

← TO JAGATPUR



Station	Horizontal	Vertical	Superelevation	Change
24+00	15.80	15.80	0.00	0.00
24+05	15.85	15.85	0.00	0.00
24+10	15.90	15.90	0.00	0.00
24+15	15.95	15.95	0.00	0.00
24+20	16.00	16.00	0.00	0.00
24+25	16.05	16.05	0.00	0.00
24+30	16.10	16.10	0.00	0.00
24+35	16.15	16.15	0.00	0.00
24+40	16.20	16.20	0.00	0.00
24+45	16.25	16.25	0.00	0.00
24+50	16.30	16.30	0.00	0.00
24+55	16.35	16.35	0.00	0.00
24+60	16.40	16.40	0.00	0.00
24+65	16.45	16.45	0.00	0.00
24+70	16.50	16.50	0.00	0.00

CONSULTANT:
CONSULTING ENGINEERS
 PLOT NO. 10, INDUSTRIAL AREA, PHASE II, VIKRAM SARABHAI
 ROAD, CHANDIBAZAR, CUTTACK - 753 005, ODISHA, INDIA
 TEL: 0674-2521541, 2521542, 2521543 FAX: 0674-2521544
 E-MAIL: info@ceodisha.com

CLIENT:
 WORLD BANK
 GOVT. OF ODISHA

PROJECT:
 ODISHA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE

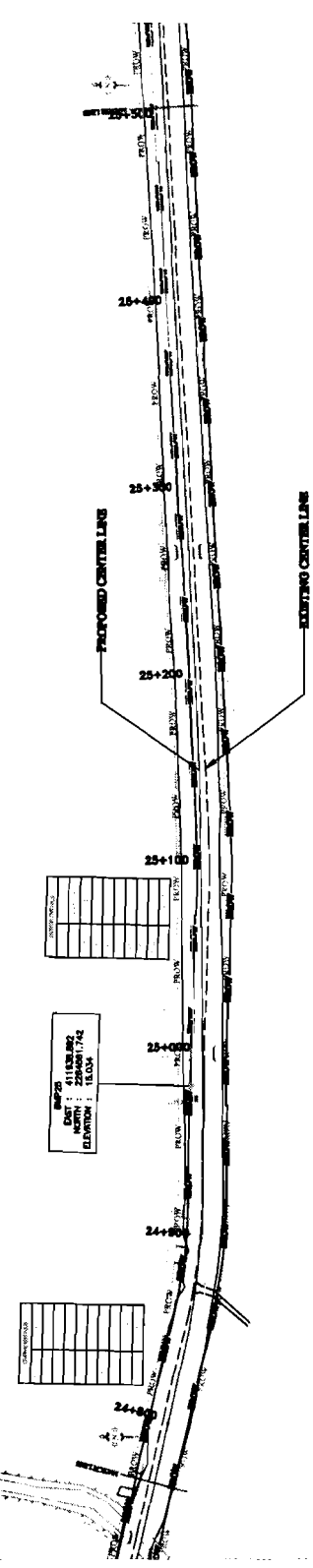
**WIDENING AND STRENGTHENING TO TWO LANE
 PLAN AND LONGITUDINAL SECTION
 JAGATPUR TO DULURA Km.34000 TO Km.34700**

DATE: 15/05/2014
SCALE: 1:1000
PROJECT NO.: 14/01/2014/OD/SA/001
REVISION: 01



TO CHANDBALI →

← TO JAGATPUR



58.000 -
57.000 -
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-98.000 -
-99.000 -
-100.000 -

DATUM = 11.000
DESIGN LEVELS

CHAINAGE	GROUND LEVELS		DESIGN LEVELS		VERTICAL CURVE DATA
	EXISTING	PROPOSED	EXISTING	PROPOSED	
23500.000	17.000	17.000	17.000	17.000	
23600.000	17.000	17.000	17.000	17.000	
23700.000	17.000	17.000	17.000	17.000	
23800.000	17.000	17.000	17.000	17.000	
23900.000	17.000	17.000	17.000	17.000	
24000.000	17.000	17.000	17.000	17.000	
24100.000	17.000	17.000	17.000	17.000	
24200.000	17.000	17.000	17.000	17.000	
24300.000	17.000	17.000	17.000	17.000	
24400.000	17.000	17.000	17.000	17.000	
24500.000	17.000	17.000	17.000	17.000	
24600.000	17.000	17.000	17.000	17.000	
24700.000	17.000	17.000	17.000	17.000	
24800.000	17.000	17.000	17.000	17.000	
24900.000	17.000	17.000	17.000	17.000	
25000.000	17.000	17.000	17.000	17.000	
25100.000	17.000	17.000	17.000	17.000	
25200.000	17.000	17.000	17.000	17.000	
25300.000	17.000	17.000	17.000	17.000	
25400.000	17.000	17.000	17.000	17.000	
25500.000	17.000	17.000	17.000	17.000	

CONSULTANT:-
CEIG CONSULTING LTD
1/1, 2/1, 3/1, 4/1, 5/1, 6/1, 7/1, 8/1, 9/1, 10/1, 11/1, 12/1, 13/1, 14/1, 15/1, 16/1, 17/1, 18/1, 19/1, 20/1, 21/1, 22/1, 23/1, 24/1, 25/1, 26/1, 27/1, 28/1, 29/1, 30/1, 31/1, 32/1, 33/1, 34/1, 35/1, 36/1, 37/1, 38/1, 39/1, 40/1, 41/1, 42/1, 43/1, 44/1, 45/1, 46/1, 47/1, 48/1, 49/1, 50/1, 51/1, 52/1, 53/1, 54/1, 55/1, 56/1, 57/1, 58/1, 59/1, 60/1, 61/1, 62/1, 63/1, 64/1, 65/1, 66/1, 67/1, 68/1, 69/1, 70/1, 71/1, 72/1, 73/1, 74/1, 75/1, 76/1, 77/1, 78/1, 79/1, 80/1, 81/1, 82/1, 83/1, 84/1, 85/1, 86/1, 87/1, 88/1, 89/1, 90/1, 91/1, 92/1, 93/1, 94/1, 95/1, 96/1, 97/1, 98/1, 99/1, 100/1

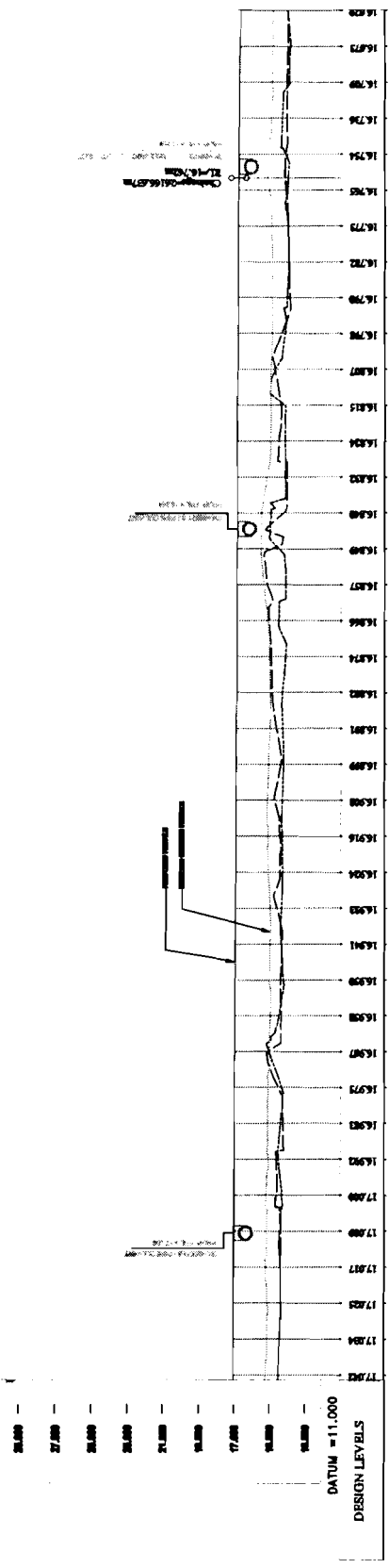
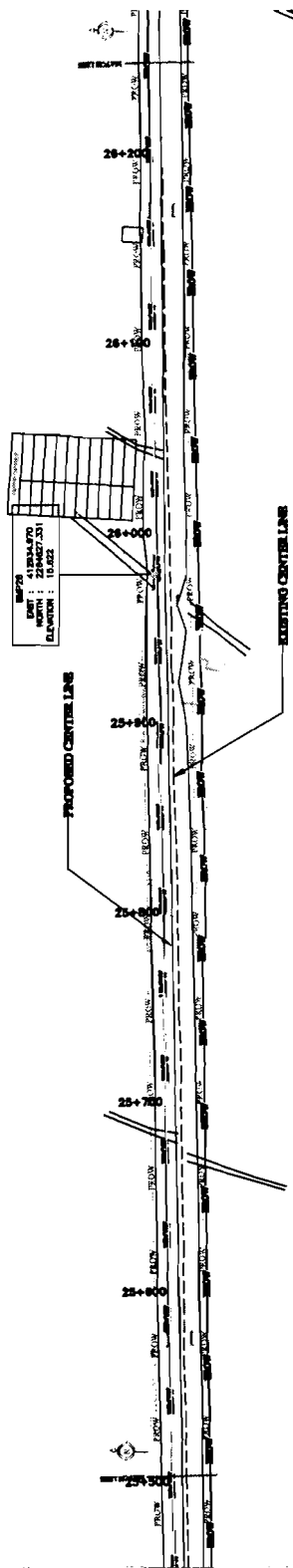
CLIENT:-
WORKS DEPT.
GOVT. OF ODISHA

PROJECT:-
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

**WIDENING AND STRENGTHENING TO TWO LANE
PLAN AND LONGITUDINAL SECTION
JAGATPUR TO DUDHURA Km. 24/7070 TO Km. 25/600**

TO CHANDBAU →

← TO JAGATPUR



STATION	HORIZONTAL		VERTICAL		SUPERELEVATION
	PC	PT	GRADE (%)	ELEVATION (M)	
25+000				38.000	
25+025				38.000	
25+050				38.000	
25+075				38.000	
25+100				38.000	
25+125				38.000	
25+150				38.000	
25+175				38.000	
25+200				38.000	
25+225				38.000	
25+250				38.000	
25+275				38.000	
25+300				38.000	
25+325				38.000	
25+350				38.000	
25+375				38.000	
25+400				38.000	
25+425				38.000	
25+450				38.000	
25+475				38.000	
25+500				38.000	
25+525				38.000	
25+550				38.000	
25+575				38.000	
25+600				38.000	
25+625				38.000	
25+650				38.000	
25+675				38.000	
25+700				38.000	
25+725				38.000	
25+750				38.000	
25+775				38.000	
25+800				38.000	
25+825				38.000	
25+850				38.000	
25+875				38.000	
25+900				38.000	
25+925				38.000	
25+950				38.000	
25+975				38.000	
26+000				38.000	

STATION	HORIZONTAL		VERTICAL		SUPERELEVATION
	PC	PT	GRADE (%)	ELEVATION (M)	
25+000				38.000	
25+025				38.000	
25+050				38.000	
25+075				38.000	
25+100				38.000	
25+125				38.000	
25+150				38.000	
25+175				38.000	
25+200				38.000	
25+225				38.000	
25+250				38.000	
25+275				38.000	
25+300				38.000	
25+325				38.000	
25+350				38.000	
25+375				38.000	
25+400				38.000	
25+425				38.000	
25+450				38.000	
25+475				38.000	
25+500				38.000	
25+525				38.000	
25+550				38.000	
25+575				38.000	
25+600				38.000	
25+625				38.000	
25+650				38.000	
25+675				38.000	
25+700				38.000	
25+725				38.000	
25+750				38.000	
25+775				38.000	
25+800				38.000	
25+825				38.000	
25+850				38.000	
25+875				38.000	
25+900				38.000	
25+925				38.000	
25+950				38.000	
25+975				38.000	
26+000				38.000	

WIDENING AND STRENGTHENING TO TWO LANE PLAN AND LONGITUDINAL SECTION JAGATPUR TO DULHURA Km.256/000 TO Km.262/250

CONSULTANT:-
COMBUSTING ENGINEERING LTD
 23/41, Chandrabhaga Road, Jagatpur,
 Dist. Bhubaneswar, Odisha
 Ph: 991-111-342999, 333186, 2229336
 Fax: 2221345, e-mail: cee@combusting.com

CLIENT:-
WORKS DEPT.
GOVT. OF ODISHA

PROJECT:-
 ODISHA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE

DATE: 15/08/2011

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

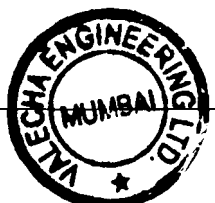
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APPROVED: [Signature]

DATE: 15/08/2011

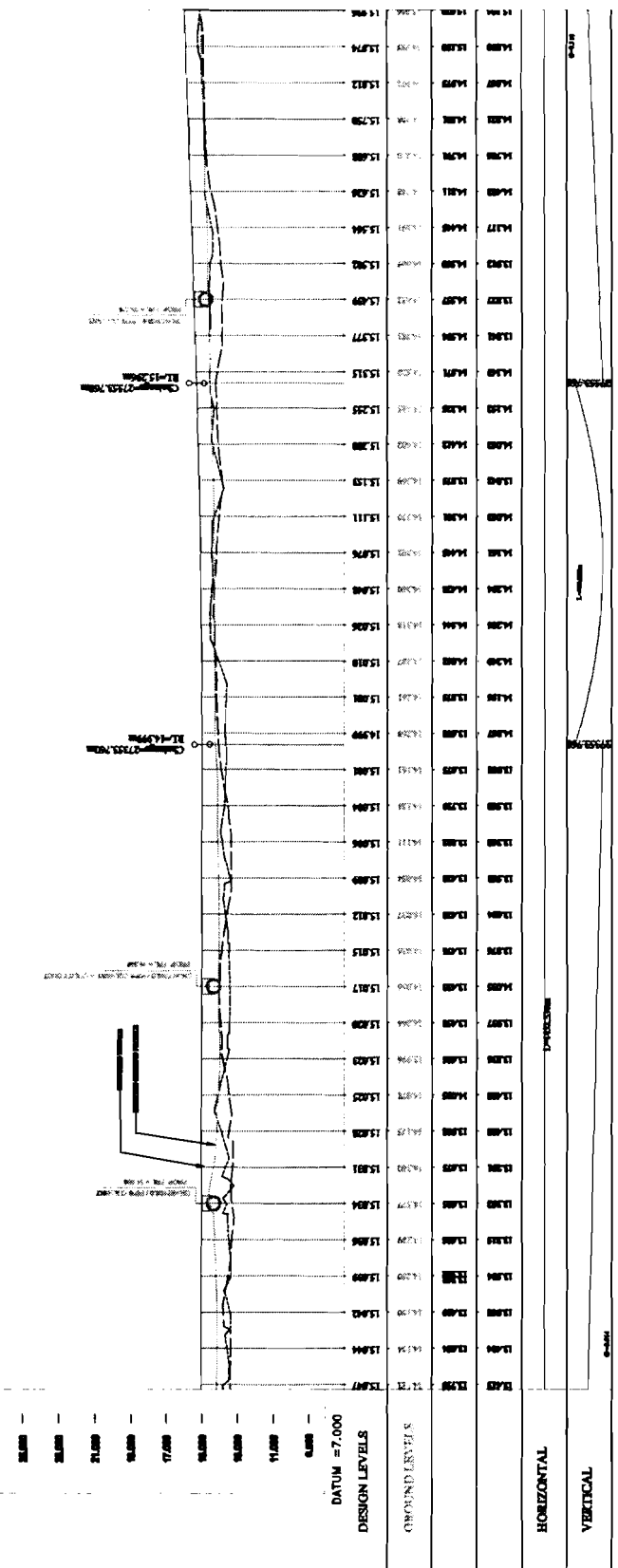
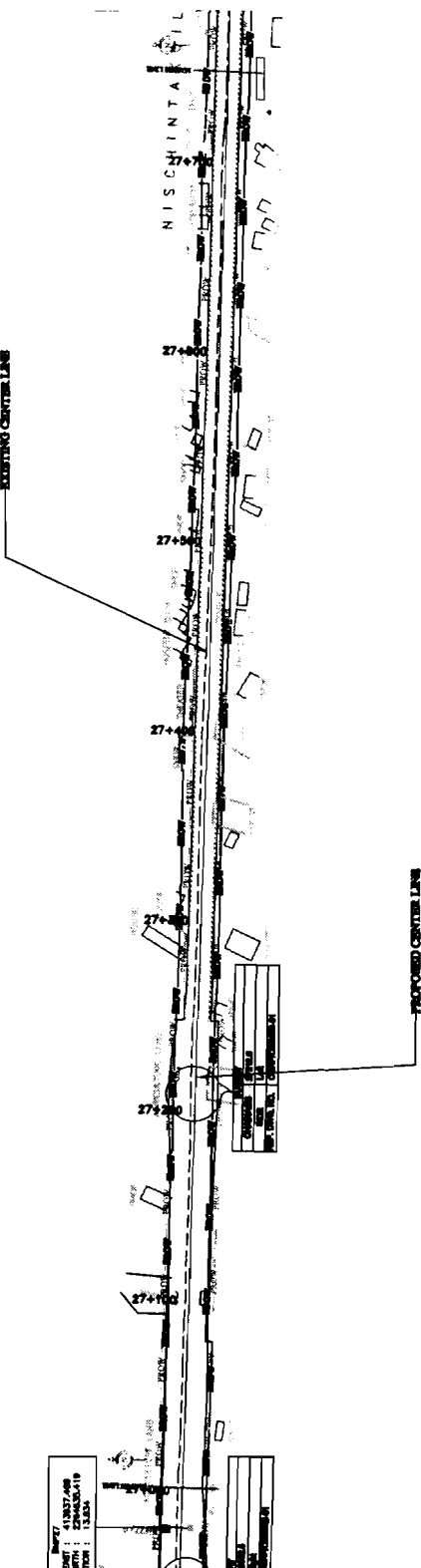
VALECHA ENGINEERING LTD.
Contractor



Chief Engineer,
 World Bank Project,
 Govt. of E.I.C. (Civil), Odisha
 Bhubaneswar.

← TO JAGATPUR

TO CHANDBALI →



CHAINAGE	SUPERELEVATION	HORIZONTAL	VERTICAL
27+000	0.000	15.944	15.944
27+050	0.000	15.943	15.943
27+100	0.000	15.944	15.944
27+150	0.000	15.943	15.943
27+200	0.000	15.944	15.944
27+250	0.000	15.943	15.943
27+300	0.000	15.944	15.944
27+350	0.000	15.943	15.943
27+400	0.000	15.944	15.944
27+450	0.000	15.943	15.943
27+500	0.000	15.944	15.944
27+550	0.000	15.943	15.943
27+600	0.000	15.944	15.944
27+650	0.000	15.943	15.943
27+700	0.000	15.944	15.944
27+750	0.000	15.943	15.943
27+800	0.000	15.944	15.944
27+850	0.000	15.943	15.943
27+900	0.000	15.944	15.944

WIDENING AND STRENGTHENING TO TWO LANE PLAN AND LONGITUDINAL SECTION JAGATPUR TO DULHURA Km.27/000 TO Km.27/700

CONSULTANT:-
VALECHA ENGINEERING LTD.
 Plot No. 13, Sector 13, Gurgaon, Haryana-122001
 Ph: 0121-4970000, 4970001, 4970002
 Fax: 0121-4970003, 4970004, 4970005
 Email: valechaengg@gmail.com

CLIENT:-
WORKS DEPT. GOVT. OF ODISHA

PROJECT:-
ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE

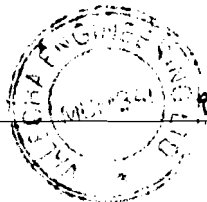
DATE: 15/08/2017

SCALE: 1:1000

DESIGNER: [Signature]

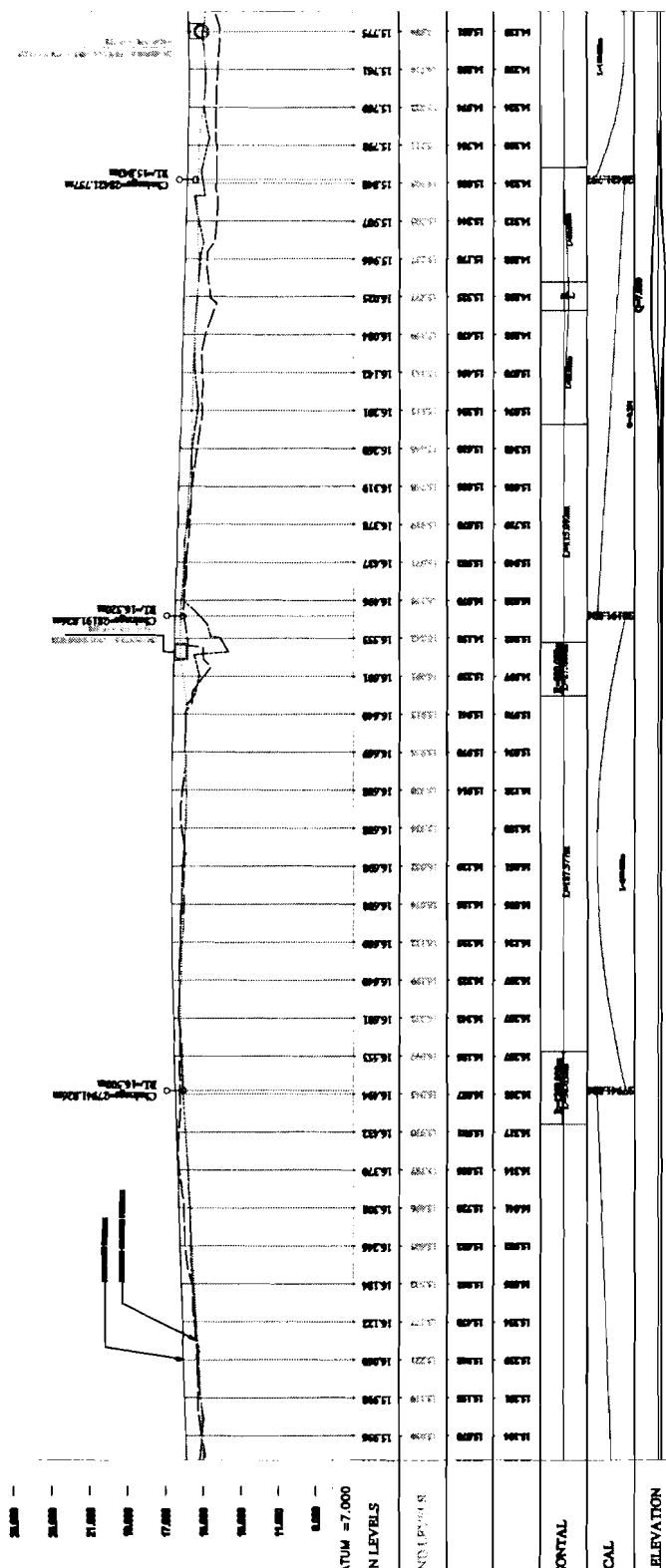
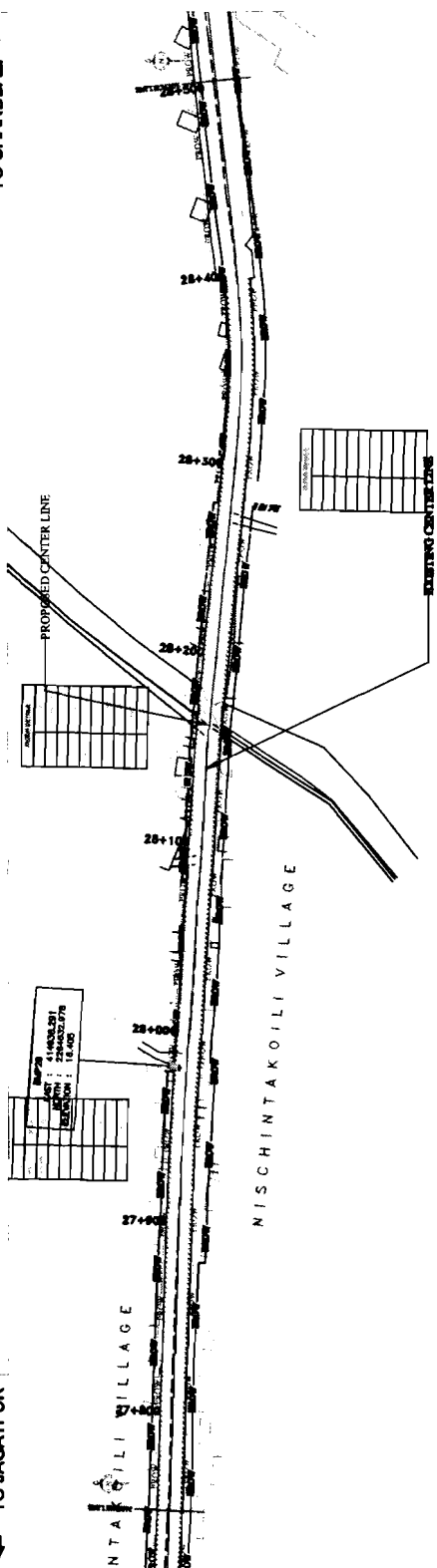
CHECKER: [Signature]

APPROVED: [Signature]



TO CHANDBALI →

← TO JAGATPUR



CHAINAGE	SUPERELEVATION	VERTICAL	HORIZONTAL
27760.000	15.805	15.805	15.805
27780.000	15.810	15.810	15.810
27800.000	15.815	15.815	15.815
27820.000	15.820	15.820	15.820
27840.000	15.825	15.825	15.825
27860.000	15.830	15.830	15.830
27880.000	15.835	15.835	15.835
27900.000	15.840	15.840	15.840
27920.000	15.845	15.845	15.845
27940.000	15.850	15.850	15.850
27960.000	15.855	15.855	15.855
27980.000	15.860	15.860	15.860
28000.000	15.865	15.865	15.865
28020.000	15.870	15.870	15.870
28040.000	15.875	15.875	15.875
28060.000	15.880	15.880	15.880
28080.000	15.885	15.885	15.885
28100.000	15.890	15.890	15.890
28120.000	15.895	15.895	15.895
28140.000	15.900	15.900	15.900
28160.000	15.905	15.905	15.905
28180.000	15.910	15.910	15.910
28200.000	15.915	15.915	15.915
28220.000	15.920	15.920	15.920
28240.000	15.925	15.925	15.925
28260.000	15.930	15.930	15.930
28280.000	15.935	15.935	15.935
28300.000	15.940	15.940	15.940
28320.000	15.945	15.945	15.945
28340.000	15.950	15.950	15.950
28360.000	15.955	15.955	15.955
28380.000	15.960	15.960	15.960
28400.000	15.965	15.965	15.965
28420.000	15.970	15.970	15.970
28440.000	15.975	15.975	15.975
28460.000	15.980	15.980	15.980
28480.000	15.985	15.985	15.985
28500.000	15.990	15.990	15.990
28520.000	15.995	15.995	15.995
28540.000	16.000	16.000	16.000
28560.000	16.005	16.005	16.005
28580.000	16.010	16.010	16.010
28600.000	16.015	16.015	16.015
28620.000	16.020	16.020	16.020
28640.000	16.025	16.025	16.025
28660.000	16.030	16.030	16.030
28680.000	16.035	16.035	16.035
28700.000	16.040	16.040	16.040
28720.000	16.045	16.045	16.045
28740.000	16.050	16.050	16.050
28760.000	16.055	16.055	16.055
28780.000	16.060	16.060	16.060
28800.000	16.065	16.065	16.065
28820.000	16.070	16.070	16.070
28840.000	16.075	16.075	16.075
28860.000	16.080	16.080	16.080
28880.000	16.085	16.085	16.085
28900.000	16.090	16.090	16.090
28920.000	16.095	16.095	16.095
28940.000	16.100	16.100	16.100
28960.000	16.105	16.105	16.105
28980.000	16.110	16.110	16.110
29000.000	16.115	16.115	16.115
29020.000	16.120	16.120	16.120
29040.000	16.125	16.125	16.125
29060.000	16.130	16.130	16.130
29080.000	16.135	16.135	16.135
29100.000	16.140	16.140	16.140
29120.000	16.145	16.145	16.145
29140.000	16.150	16.150	16.150
29160.000	16.155	16.155	16.155
29180.000	16.160	16.160	16.160
29200.000	16.165	16.165	16.165
29220.000	16.170	16.170	16.170
29240.000	16.175	16.175	16.175
29260.000	16.180	16.180	16.180
29280.000	16.185	16.185	16.185
29300.000	16.190	16.190	16.190
29320.000	16.195	16.195	16.195
29340.000	16.200	16.200	16.200
29360.000	16.205	16.205	16.205
29380.000	16.210	16.210	16.210
29400.000	16.215	16.215	16.215
29420.000	16.220	16.220	16.220
29440.000	16.225	16.225	16.225
29460.000	16.230	16.230	16.230
29480.000	16.235	16.235	16.235
29500.000	16.240	16.240	16.240
29520.000	16.245	16.245	16.245
29540.000	16.250	16.250	16.250
29560.000	16.255	16.255	16.255
29580.000	16.260	16.260	16.260
29600.000	16.265	16.265	16.265
29620.000	16.270	16.270	16.270
29640.000	16.275	16.275	16.275
29660.000	16.280	16.280	16.280
29680.000	16.285	16.285	16.285
29700.000	16.290	16.290	16.290
29720.000	16.295	16.295	16.295
29740.000	16.300	16.300	16.300
29760.000	16.305	16.305	16.305
29780.000	16.310	16.310	16.310
29800.000	16.315	16.315	16.315
29820.000	16.320	16.320	16.320
29840.000	16.325	16.325	16.325
29860.000	16.330	16.330	16.330
29880.000	16.335	16.335	16.335
29900.000	16.340	16.340	16.340
29920.000	16.345	16.345	16.345
29940.000	16.350	16.350	16.350
29960.000	16.355	16.355	16.355
29980.000	16.360	16.360	16.360
30000.000	16.365	16.365	16.365

PROJECT: ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE

CLIENT: GOVT. OF ODISHA

CONSULTANT: VALECHA ENGINEERING LTD

WIDENING AND STRENGTHENING TO TWO LANE PLAN AND LONGITUDINAL SECTION JAGATPUR TO DUDHURA Km.27760 TO Km.29000

DATE: 15/05/2014

SCALE: 1:1000

PROJECT NO.: 141/141/2010/23100/2300/1

CONSULTANT'S NO.: 201/141

DATE OF ISSUE: 15/05/2014

PROJECT LOCATION: JAGATPUR TO DUDHURA

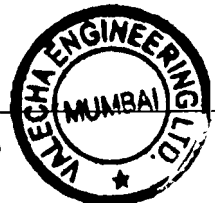
SCALE: 1:1000

PROJECT NO.: 141/141/2010/23100/2300/1

CONSULTANT'S NO.: 201/141

DATE OF ISSUE: 15/05/2014

PROJECT LOCATION: JAGATPUR TO DUDHURA

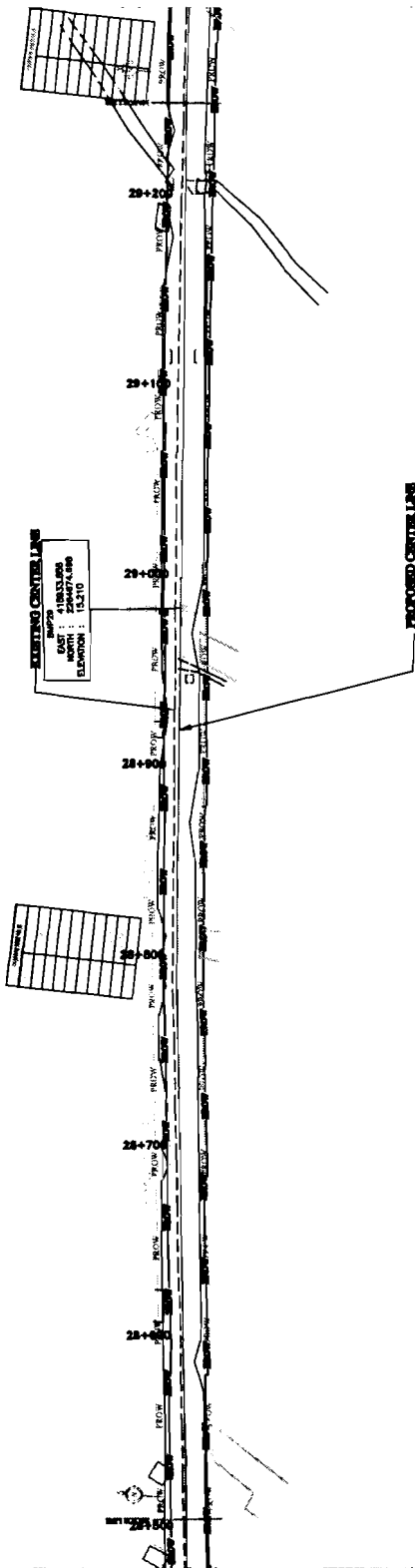


VALECHA ENGINEERING LTD
Contractor

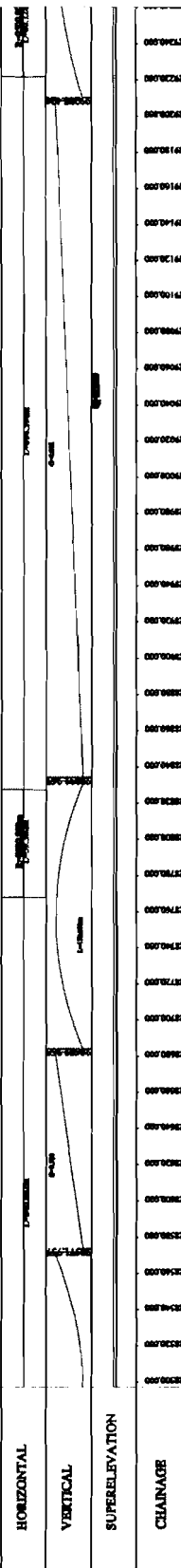
Chief Engineer,
Odisha
World Bank Project
O/o the E.I.C.(Civil),
Bhubaneswar.

TO CHANDRALI →

← TO JAGATPUR



CHAINAGE	GROUND LEVELS	DESIGN LEVELS	HORIZONTAL	VERTICAL	SUPERELEVATION
28+70	15.775	15.800	15.800	15.800	0.000
28+71	15.800	15.825	15.825	15.825	0.000
28+72	15.825	15.850	15.850	15.850	0.000
28+73	15.850	15.875	15.875	15.875	0.000
28+74	15.875	15.900	15.900	15.900	0.000
28+75	15.900	15.925	15.925	15.925	0.000
28+76	15.925	15.950	15.950	15.950	0.000
28+77	15.950	15.975	15.975	15.975	0.000
28+78	15.975	16.000	16.000	16.000	0.000
28+79	16.000	16.025	16.025	16.025	0.000
28+80	16.025	16.050	16.050	16.050	0.000
28+81	16.050	16.075	16.075	16.075	0.000
28+82	16.075	16.100	16.100	16.100	0.000
28+83	16.100	16.125	16.125	16.125	0.000
28+84	16.125	16.150	16.150	16.150	0.000
28+85	16.150	16.175	16.175	16.175	0.000
28+86	16.175	16.200	16.200	16.200	0.000
28+87	16.200	16.225	16.225	16.225	0.000
28+88	16.225	16.250	16.250	16.250	0.000
28+89	16.250	16.275	16.275	16.275	0.000
28+90	16.275	16.300	16.300	16.300	0.000



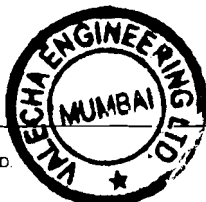
CHAINAGE	GROUND LEVELS	DESIGN LEVELS	HORIZONTAL	VERTICAL	SUPERELEVATION
28+91	16.300	16.325	16.325	16.325	0.000
28+92	16.325	16.350	16.350	16.350	0.000
28+93	16.350	16.375	16.375	16.375	0.000
28+94	16.375	16.400	16.400	16.400	0.000
28+95	16.400	16.425	16.425	16.425	0.000
28+96	16.425	16.450	16.450	16.450	0.000
28+97	16.450	16.475	16.475	16.475	0.000
28+98	16.475	16.500	16.500	16.500	0.000
28+99	16.500	16.525	16.525	16.525	0.000
29+00	16.525	16.550	16.550	16.550	0.000

PROJECT:
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

CLIENT:
ROADS DEPT.
GOVT. OF ODISHA.

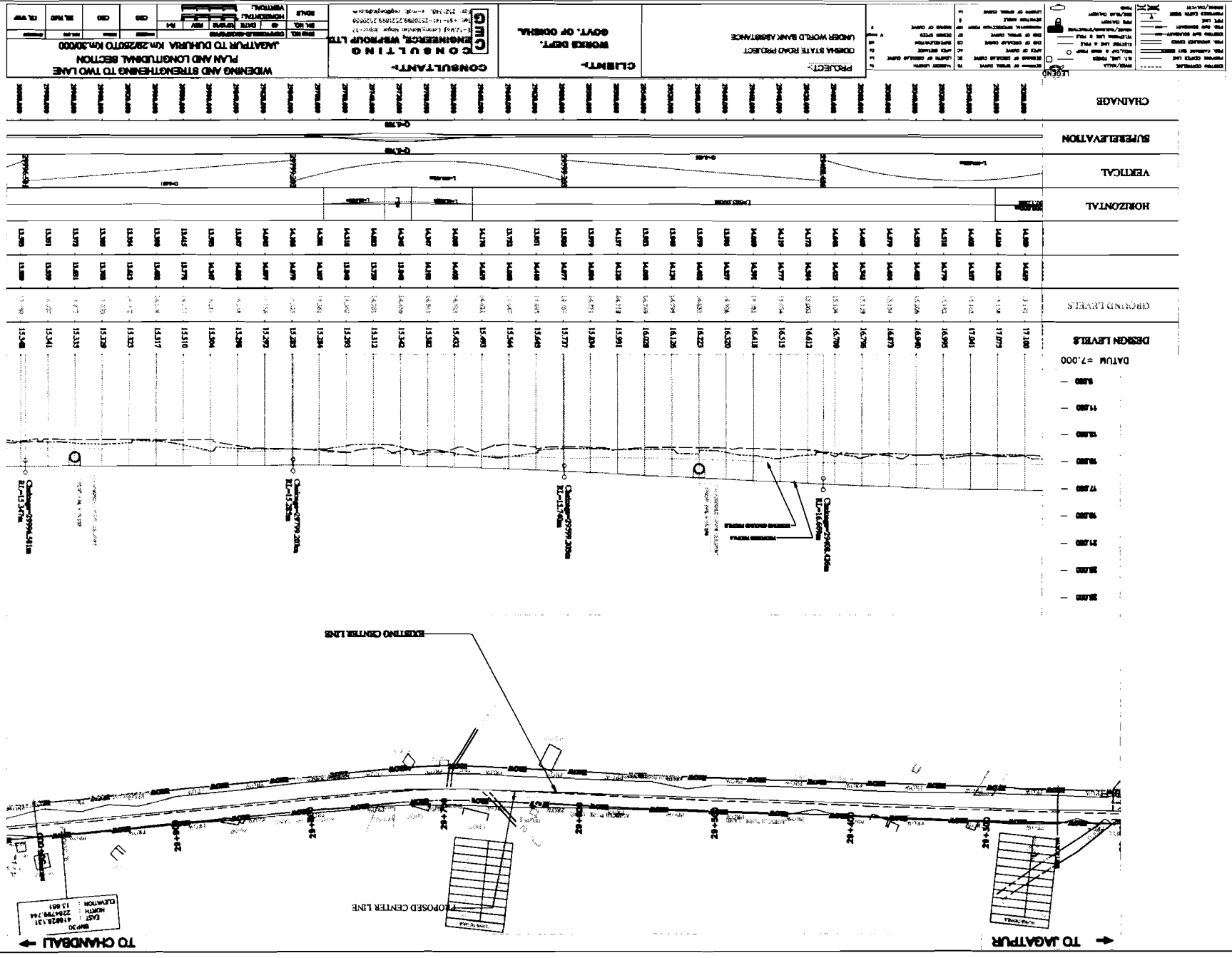
CONSULTANT:
PROMULSING CONSULTING ENGINEERS PVT. LTD.
17/1, 1/11, 2/20/2002, 201/200, 207/200A
INDRA VIHAR, SECTOR-17, COLONY-1, CUTTACK, ODISHA-753004
INDIA
Tel: 0674-2521340, 2521341, 2521342, 2521343
Fax: 0674-2521345, 2521346, 2521347
E-mail: info@promulsing.com

NO.	REVISION	DATE	BY	CHKD.
1	ISSUED FOR TENDER			
2	REVISED FOR CONTRACT			
3	REVISED FOR EXECUTION			
4	REVISED FOR AS-BUILT			
5	REVISED FOR FINAL BILL			



VALECHA ENGINEERING LTD.
Contractor

Chief Engineer,
World Bank Project Odisha
Roads Dept. Cuttack
to the E.I.C.(Civil), Odisha
Rhubaneswar.



PROJECT: ODISHA STATE ROAD PROJECT
CLIENT: WORKS DEPT., GOVT. OF ODISHA
CONSULTANT: GMC CONSULTING ENGINEERS, Bhubaneswar, Odisha

PROJECT TITLE: WIDENING AND STRENGTHENING TO TWO LANE JAGATPUR TO DHURIA Km 29/250 TO Km 30/000

DATE: 13/08/2014
SCALE: 1:1000

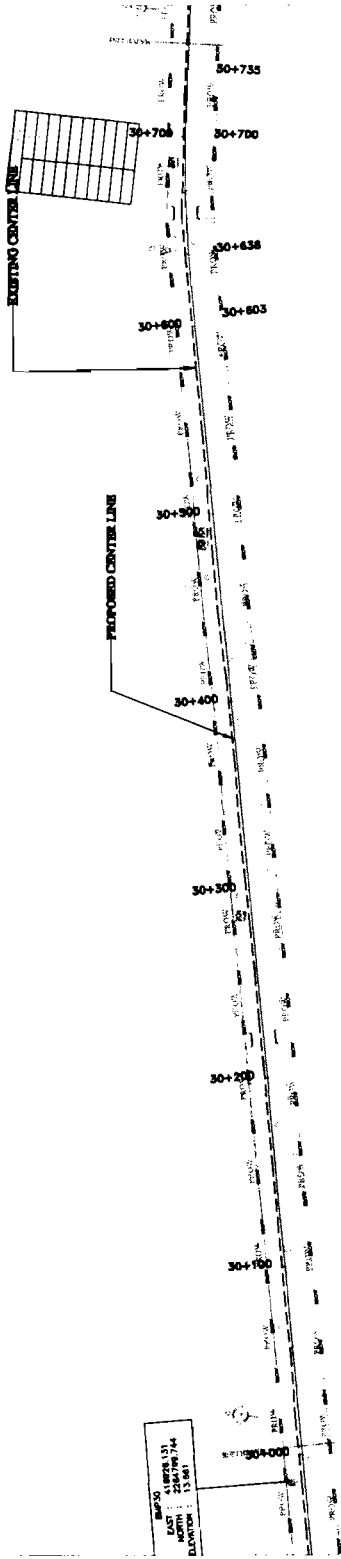
REVISIONS:

NO.	DATE	DESCRIPTION
1	13/08/2014	ISSUED FOR TENDER

Sheet No. 30
 EAST 41828.131
 NORTH 2284779.214
 LENGTH 13.681

← TO JAGATPUR

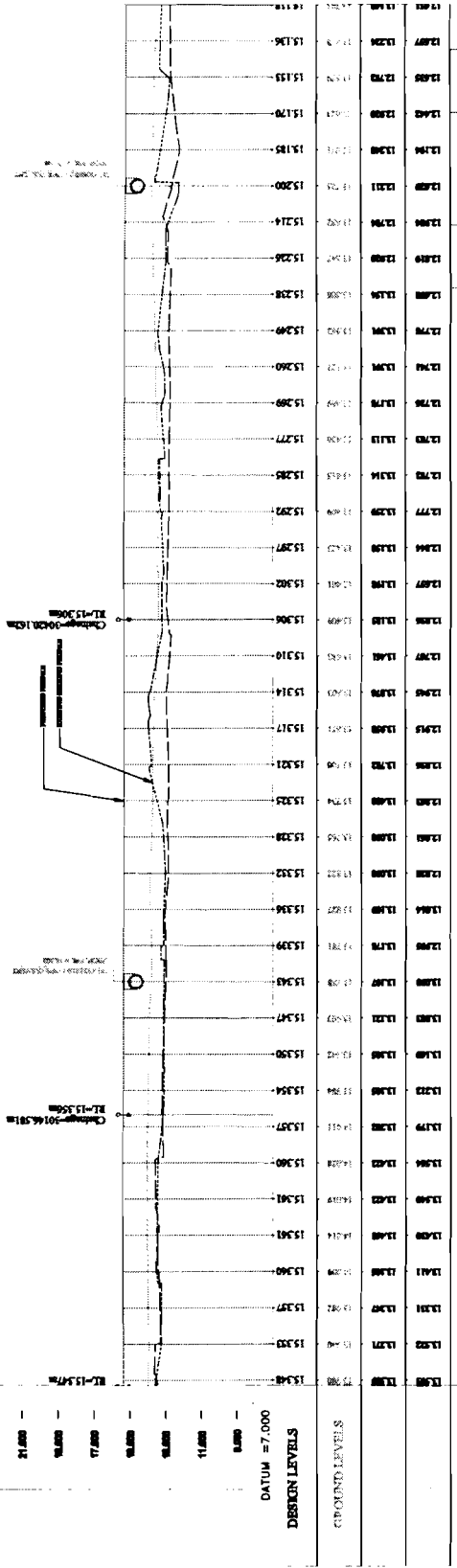
TO CHANDBALI →



DATE: 11/08/13
 DRAWN BY: [Signature]
 CHECKED BY: [Signature]

DATUM = 7.000

DESIGN LEVELS	13.48	13.53	13.57	13.60	13.61	13.62	13.64	13.66	13.68	13.70	13.72	13.74	13.76	13.78	13.80	13.82	13.84	13.86	13.88	13.90	13.92	13.94	13.96	13.98	14.00	14.02	14.04	14.06	14.08	14.10	14.12	14.14	14.16	14.18	14.20	14.22	14.24	14.26	14.28	14.30	14.32	14.34	14.36	14.38	14.40	14.42	14.44	14.46	14.48	14.50	14.52	14.54	14.56	14.58	14.60	14.62	14.64	14.66	14.68	14.70	14.72	14.74	14.76	14.78	14.80	14.82	14.84	14.86	14.88	14.90	14.92	14.94	14.96	14.98	15.00	15.02	15.04	15.06	15.08	15.10	15.12	15.14	15.16	15.18	15.20	15.22	15.24	15.26	15.28	15.30	15.32	15.34	15.36	15.38	15.40	15.42	15.44	15.46	15.48	15.50	15.52	15.54	15.56	15.58	15.60	15.62	15.64	15.66	15.68	15.70	15.72	15.74	15.76	15.78	15.80	15.82	15.84	15.86	15.88	15.90	15.92	15.94	15.96	15.98	16.00
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HORIZONTAL	VERTICAL	SUPERELEVATION	CHAINAGE
13.48	13.53	0.000	30+000
13.57	13.60	0.000	30+100
13.61	13.62	0.000	30+200
13.62	13.64	0.000	30+300
13.64	13.66	0.000	30+400
13.66	13.68	0.000	30+500
13.68	13.70	0.000	30+600
13.70	13.72	0.000	30+700
13.72	13.74	0.000	30+800
13.74	13.76	0.000	30+900
13.76	13.78	0.000	30+1000
13.78	13.80	0.000	30+1100
13.80	13.82	0.000	30+1200
13.82	13.84	0.000	30+1300
13.84	13.86	0.000	30+1400
13.86	13.88	0.000	30+1500
13.88	13.90	0.000	30+1600
13.90	13.92	0.000	30+1700
13.92	13.94	0.000	30+1800
13.94	13.96	0.000	30+1900
13.96	13.98	0.000	30+2000
13.98	14.00	0.000	30+2100
14.00	14.02	0.000	30+2200
14.02	14.04	0.000	30+2300
14.04	14.06	0.000	30+2400
14.06	14.08	0.000	30+2500
14.08	14.10	0.000	30+2600
14.10	14.12	0.000	30+2700
14.12	14.14	0.000	30+2800
14.14	14.16	0.000	30+2900
14.16	14.18	0.000	30+3000
14.18	14.20	0.000	30+3100
14.20	14.22	0.000	30+3200
14.22	14.24	0.000	30+3300
14.24	14.26	0.000	30+3400
14.26	14.28	0.000	30+3500
14.28	14.30	0.000	30+3600
14.30	14.32	0.000	30+3700
14.32	14.34	0.000	30+3800
14.34	14.36	0.000	30+3900
14.36	14.38	0.000	30+4000
14.38	14.40	0.000	30+4100
14.40	14.42	0.000	30+4200
14.42	14.44	0.000	30+4300
14.44	14.46	0.000	30+4400
14.46	14.48	0.000	30+4500
14.48	14.50	0.000	30+4600
14.50	14.52	0.000	30+4700
14.52	14.54	0.000	30+4800
14.54	14.56	0.000	30+4900
14.56	14.58	0.000	30+5000
14.58	14.60	0.000	30+5100
14.60	14.62	0.000	30+5200
14.62	14.64	0.000	30+5300
14.64	14.66	0.000	30+5400
14.66	14.68	0.000	30+5500
14.68	14.70	0.000	30+5600
14.70	14.72	0.000	30+5700
14.72	14.74	0.000	30+5800
14.74	14.76	0.000	30+5900
14.76	14.78	0.000	30+6000
14.78	14.80	0.000	30+6100
14.80	14.82	0.000	30+6200
14.82	14.84	0.000	30+6300
14.84	14.86	0.000	30+6400
14.86	14.88	0.000	30+6500
14.88	14.90	0.000	30+6600
14.90	14.92	0.000	30+6700
14.92	14.94	0.000	30+6800
14.94	14.96	0.000	30+6900
14.96	14.98	0.000	30+7000
14.98	15.00	0.000	30+7100
15.00	15.02	0.000	30+7200
15.02	15.04	0.000	30+7300
15.04	15.06	0.000	30+7400
15.06	15.08	0.000	30+7500
15.08	15.10	0.000	30+7600
15.10	15.12	0.000	30+7700
15.12	15.14	0.000	30+7800
15.14	15.16	0.000	30+7900
15.16	15.18	0.000	30+8000
15.18	15.20	0.000	30+8100
15.20	15.22	0.000	30+8200
15.22	15.24	0.000	30+8300
15.24	15.26	0.000	30+8400
15.26	15.28	0.000	30+8500
15.28	15.30	0.000	30+8600
15.30	15.32	0.000	30+8700
15.32	15.34	0.000	30+8800
15.34	15.36	0.000	30+8900
15.36	15.38	0.000	30+9000
15.38	15.40	0.000	30+9100
15.40	15.42	0.000	30+9200
15.42	15.44	0.000	30+9300
15.44	15.46	0.000	30+9400
15.46	15.48	0.000	30+9500
15.48	15.50	0.000	30+9600
15.50	15.52	0.000	30+9700
15.52	15.54	0.000	30+9800
15.54	15.56	0.000	30+9900
15.56	15.58	0.000	30+10000

PROJECT: ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE

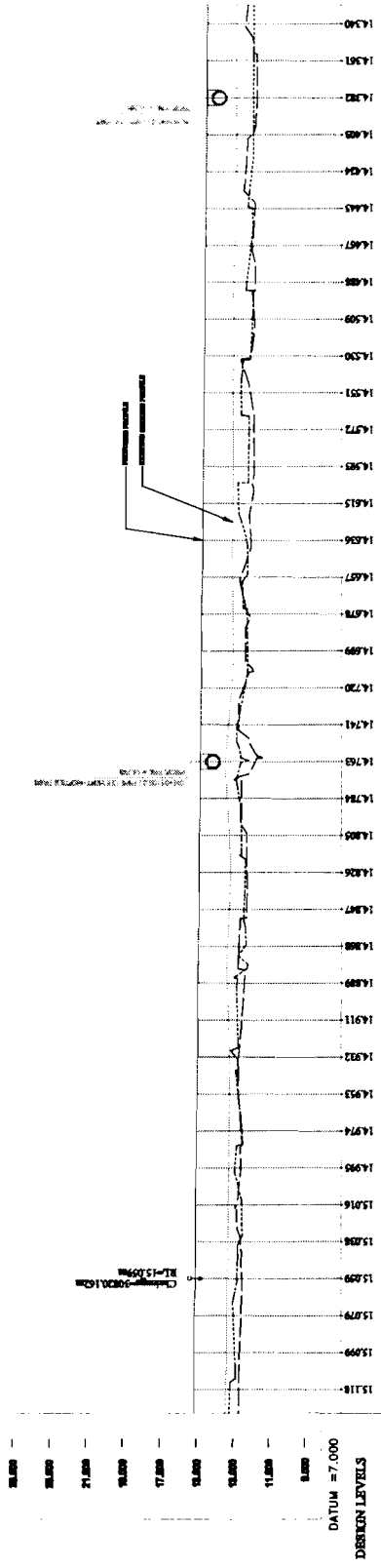
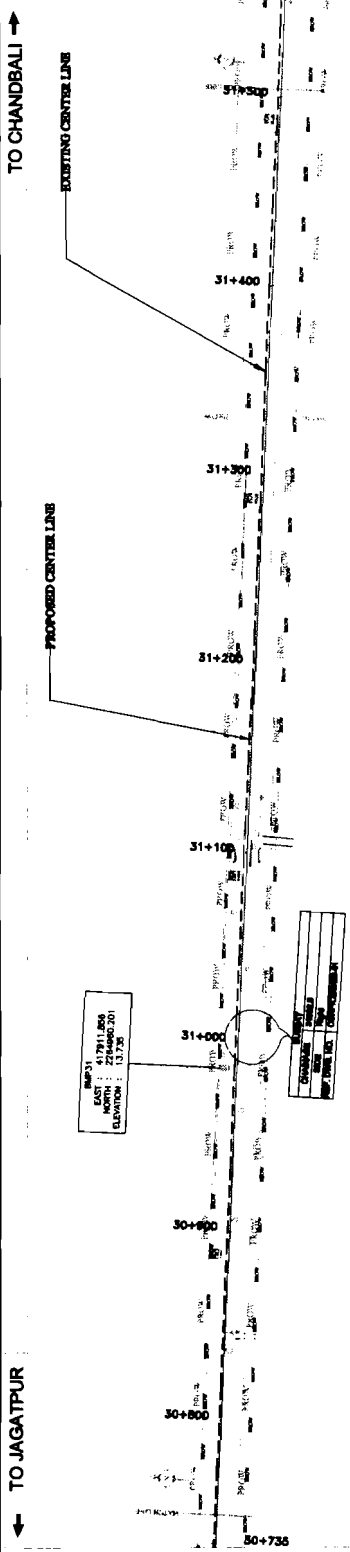
CLIENT: WORKS DEPT. GOVT. OF ODISHA

CONSULTANT: VALECHA ENGINEERING LTD. CONSULTING ENGINEERS GROUP LTD.

WIDENING AND STRENGTHENING TO TWO LANE PLAN AND LONGITUDINAL SECTION JAGATPUR TO DUFLEHA Km. 3000 TO Km. 30750

DATE: 11/08/13
 DRAWN BY: [Signature]
 CHECKED BY: [Signature]





CHAINAGE	HORIZONTAL	VERTICAL	SUPERELEVATION
30+800	15.118	15.140	
30+850	15.119	15.141	
30+900	15.120	15.142	
30+950	15.121	15.143	
31+000	15.122	15.144	
31+050	15.123	15.145	
31+100	15.124	15.146	
31+150	15.125	15.147	
31+200	15.126	15.148	
31+250	15.127	15.149	
31+300	15.128	15.150	
31+350	15.129	15.151	
31+400	15.130	15.152	

CHAINAGE	DESIGN LEVELS	GROUND LEVELS
30+800	15.118	15.140
30+850	15.119	15.141
30+900	15.120	15.142
30+950	15.121	15.143
31+000	15.122	15.144
31+050	15.123	15.145
31+100	15.124	15.146
31+150	15.125	15.147
31+200	15.126	15.148
31+250	15.127	15.149
31+300	15.128	15.150
31+350	15.129	15.151
31+400	15.130	15.152

PROJECT:
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

CLIENT:
WORKS DEPT.
GOVT. OF ODISHA

CONSULTANT:
VALECHA ENGINEERING LTD.
10/1, 10/2, 10/3, 10/4, 10/5, 10/6, 10/7, 10/8, 10/9, 10/10, 10/11, 10/12, 10/13, 10/14, 10/15, 10/16, 10/17, 10/18, 10/19, 10/20, 10/21, 10/22, 10/23, 10/24, 10/25, 10/26, 10/27, 10/28, 10/29, 10/30, 10/31, 10/32, 10/33, 10/34, 10/35, 10/36, 10/37, 10/38, 10/39, 10/40, 10/41, 10/42, 10/43, 10/44, 10/45, 10/46, 10/47, 10/48, 10/49, 10/50, 10/51, 10/52, 10/53, 10/54, 10/55, 10/56, 10/57, 10/58, 10/59, 10/60, 10/61, 10/62, 10/63, 10/64, 10/65, 10/66, 10/67, 10/68, 10/69, 10/70, 10/71, 10/72, 10/73, 10/74, 10/75, 10/76, 10/77, 10/78, 10/79, 10/80, 10/81, 10/82, 10/83, 10/84, 10/85, 10/86, 10/87, 10/88, 10/89, 10/90, 10/91, 10/92, 10/93, 10/94, 10/95, 10/96, 10/97, 10/98, 10/99, 10/100

**WIDENING AND STRENGTHENING TO TWO LANE
PLAN AND LONGITUDINAL SECTION
JAGATPUR TO DURUA Km.307850 TO Km.31400**

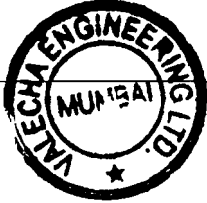
SCALE:
PLAN: 1:1000
LONGITUDINAL: 1:100

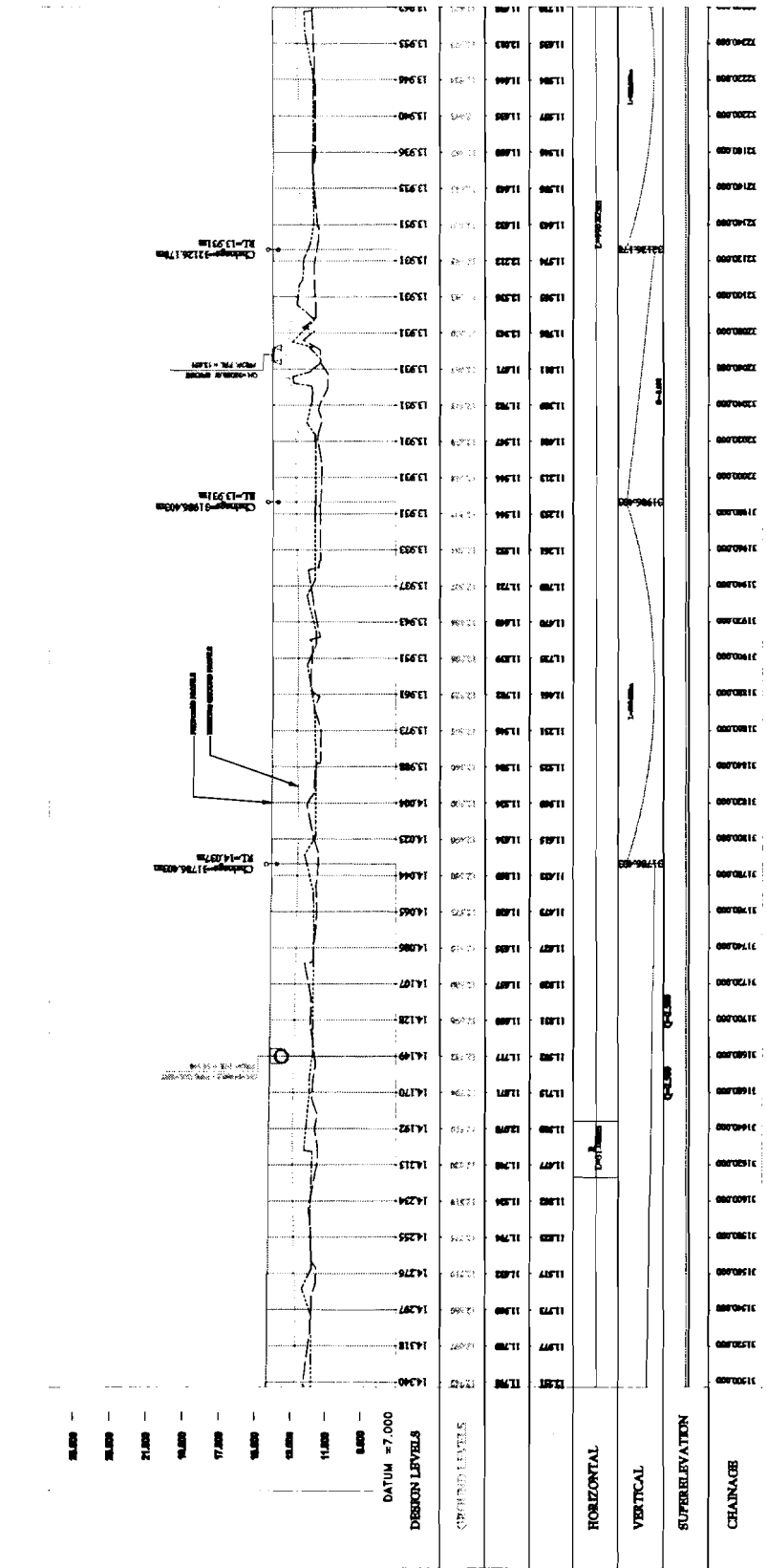
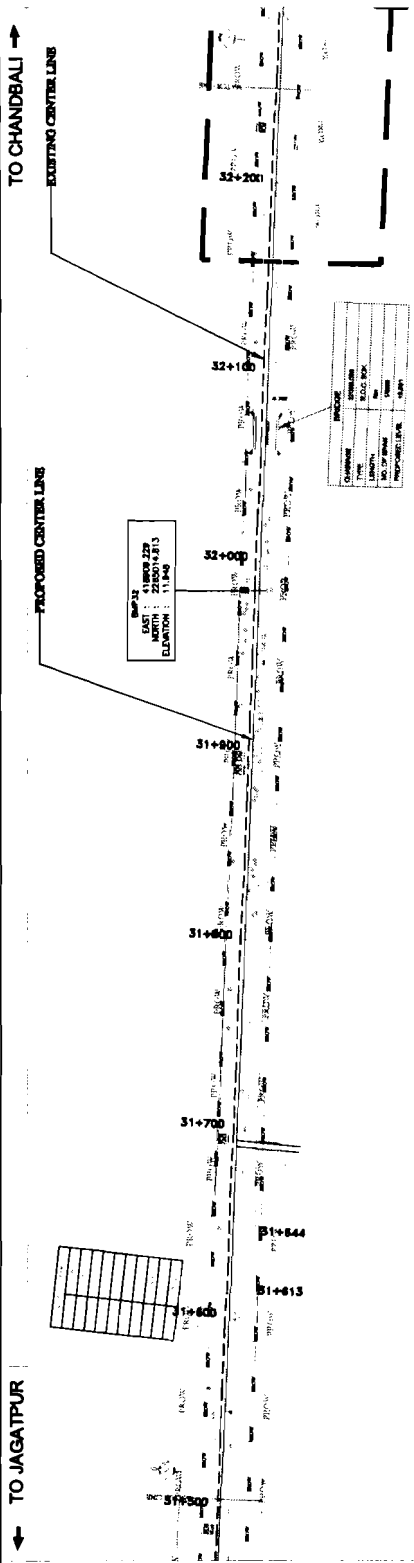
DATE: 10/10/2010

BY: [Signature]

CHECKED: [Signature]

APPROVED: [Signature]



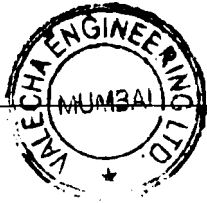


CHAINAGE	SUPERELEVATION		VERTICAL	HORIZONTAL
	Left	Right		
13400	0.00	0.00	11790	13400
13450	0.00	0.00	11790	13450
13500	0.00	0.00	11790	13500
13550	0.00	0.00	11790	13550
13600	0.00	0.00	11790	13600
13650	0.00	0.00	11790	13650
13700	0.00	0.00	11790	13700
13750	0.00	0.00	11790	13750
13800	0.00	0.00	11790	13800
13850	0.00	0.00	11790	13850
13900	0.00	0.00	11790	13900
13950	0.00	0.00	11790	13950

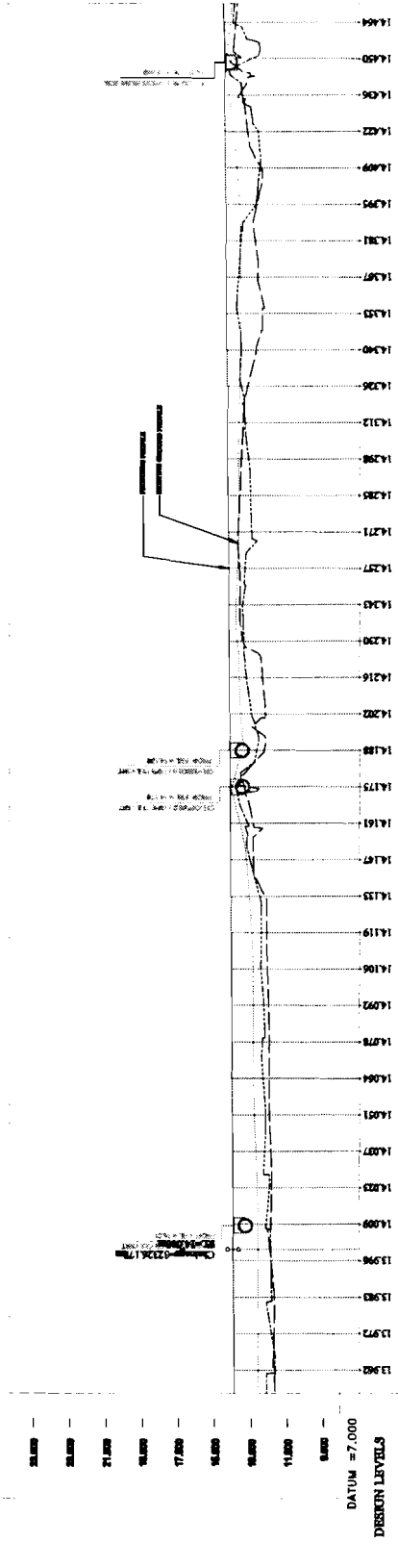
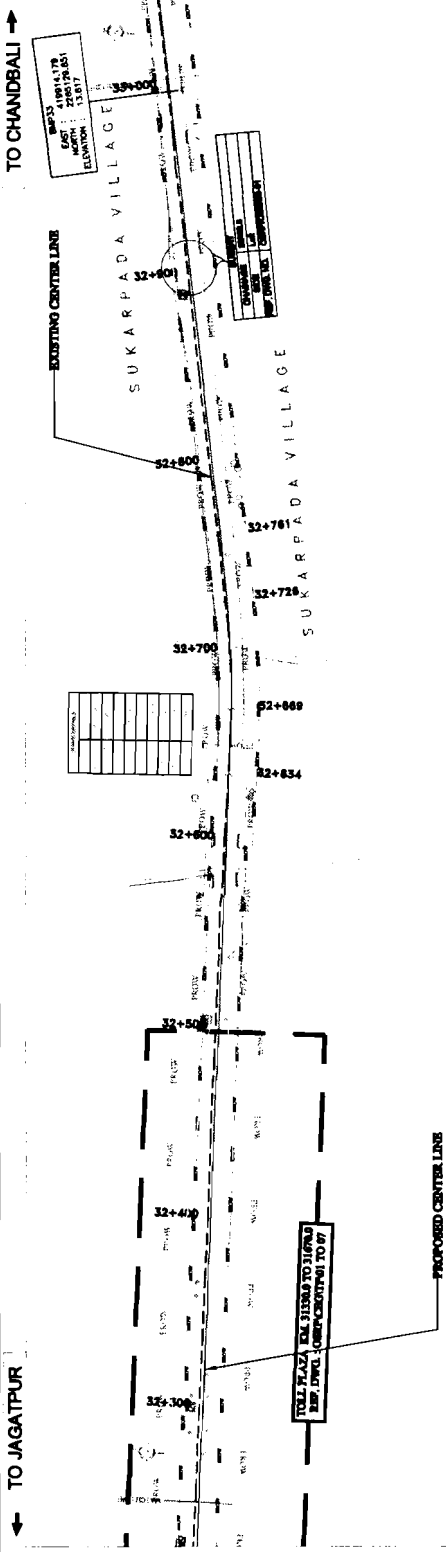
LEGEND	
1	EXISTING CENTER LINE
2	PROPOSED CENTER LINE
3	PROPOSED ROAD PROFILE
4	PROPOSED SUPERELEVATION
5	PROPOSED HORIZONTAL ALIGNMENT
6	PROPOSED VERTICAL ALIGNMENT
7	PROPOSED CHANGING POINT
8	PROPOSED CHANGING POINT
9	PROPOSED CHANGING POINT
10	PROPOSED CHANGING POINT

PROJECT INFORMATION	
PROJECT:	GOVERNMENT ROAD PROJECT
CLIENT:	GOVT. OF ODISHA
CONSULTANT:	VALECHA ENGINEERING LTD.
DATE:	15/08/2011
SCALE:	HORIZONTAL: 1:1000, VERTICAL: 1:100
CL. NO.:	15
CL. WP.:	15

VALECHA ENGINEERING LTD.
Contractor



Chief Engineer,
World Bank Group
for the Government of Odisha
Bhubaneswar.



STATION	GROUND LEVEL	DESIGN LEVEL	VERTICAL CURVE DATA
32+300	13.943	13.943	
32+310	13.973	13.973	
32+320	13.983	13.983	
32+330	13.973	13.973	
32+340	13.943	13.943	
32+350	13.893	13.893	
32+360	13.823	13.823	
32+370	13.743	13.743	
32+380	13.653	13.653	
32+390	13.553	13.553	
32+400	13.443	13.443	
32+410	13.323	13.323	
32+420	13.193	13.193	
32+430	13.053	13.053	
32+440	12.903	12.903	
32+450	12.743	12.743	
32+460	12.573	12.573	
32+470	12.393	12.393	
32+480	12.203	12.203	
32+490	12.003	12.003	
32+500	11.793	11.793	
32+510	11.573	11.573	
32+520	11.343	11.343	
32+530	11.103	11.103	
32+540	10.853	10.853	
32+550	10.593	10.593	
32+560	10.323	10.323	
32+570	10.043	10.043	
32+580	9.753	9.753	
32+590	9.453	9.453	
32+600	9.143	9.143	
32+610	8.823	8.823	
32+620	8.493	8.493	
32+630	8.153	8.153	
32+640	7.803	7.803	
32+650	7.443	7.443	
32+660	7.073	7.073	
32+670	6.693	6.693	
32+680	6.303	6.303	
32+690	5.903	5.903	
32+700	5.493	5.493	
32+710	5.073	5.073	
32+720	4.643	4.643	
32+730	4.203	4.203	
32+740	3.753	3.753	
32+750	3.293	3.293	
32+760	2.823	2.823	
32+770	2.343	2.343	
32+780	1.853	1.853	
32+790	1.353	1.353	
32+800	0.843	0.843	

CLIENT:-
WORKS DEPT.
GOVT. OF ODISHA

PROJECT:-
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

CONSULTANT:-
VALECHA ENGINEERING LTD.
VALECHA ENGINEERING GROUP LTD.
PLOT NO. 10, INDUSTRIAL AREA, PHASE II, VIKRAM SARABHAI NAGAR, PUNE - 411 004

WIDENING AND STRENGTHENING TO TWO LANE PLAN AND LONGITUDINAL SECTION JAGATPUR TO DUBHURA Km. 32.250 TO Km. 33.000

DATE	BY	CHKD	DATE

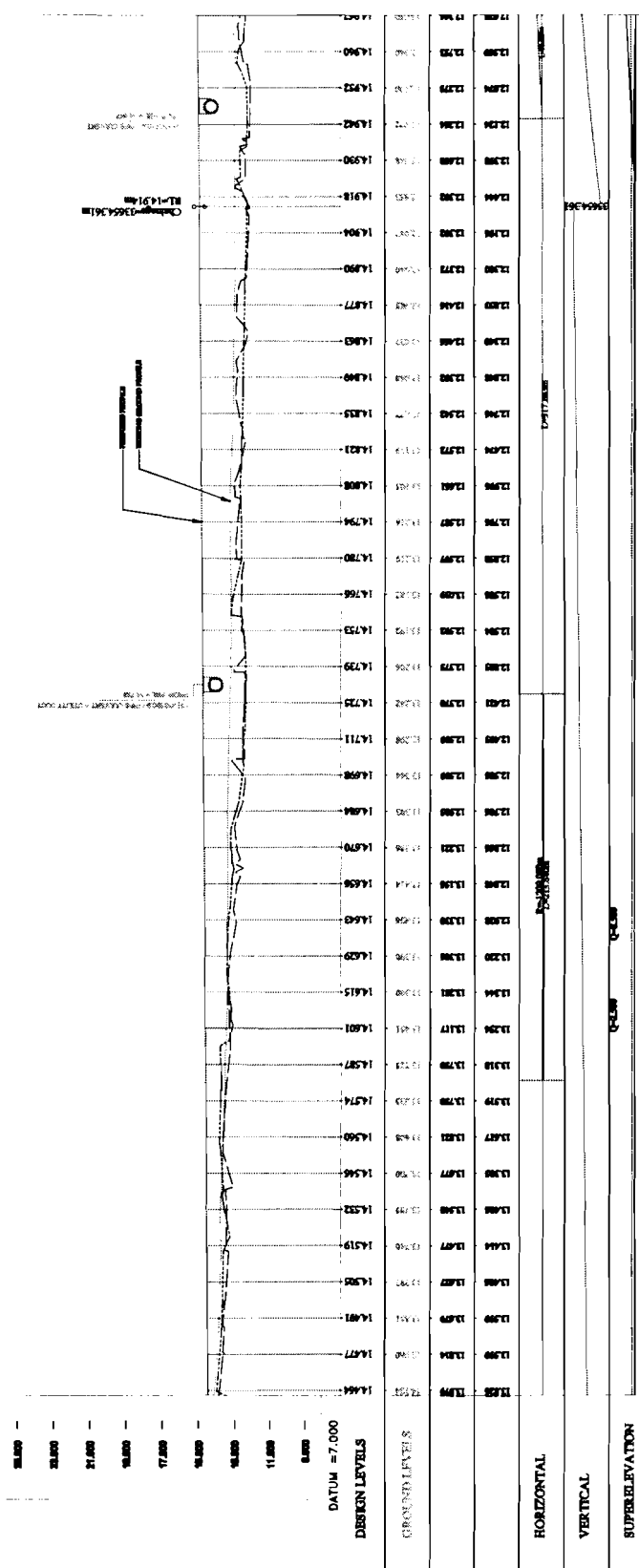
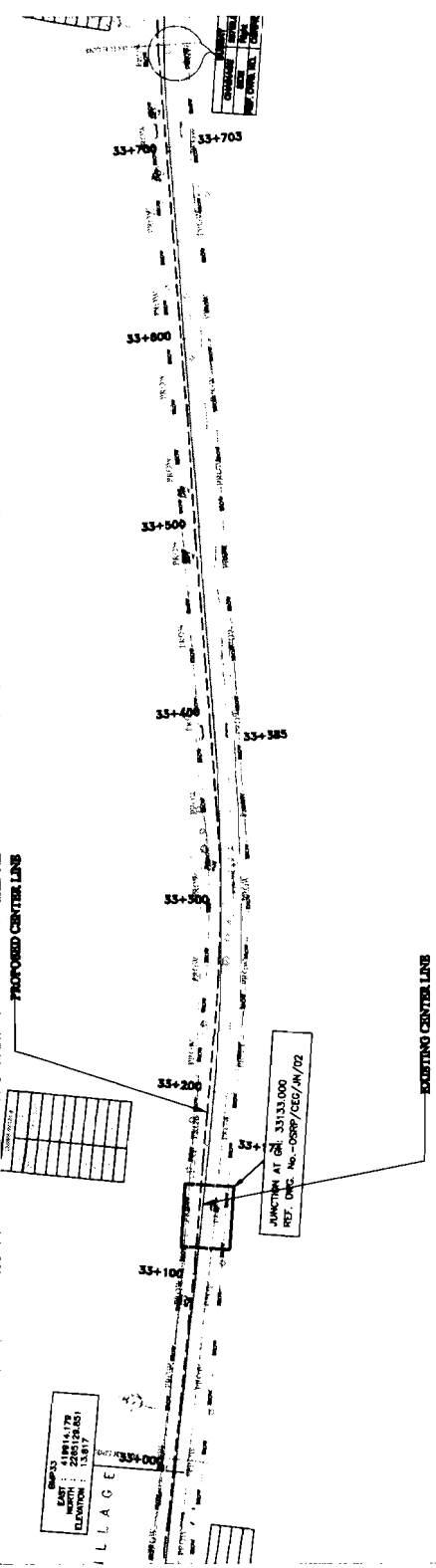
VALECHA ENGINEERING LTD.
Contractor



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

TO CHANDBALI →

← TO JAGATPUR



Station	Ground Level	Design Level	Super Elevation	Craneage
33+703	14.960	12.370	0.000	0.000
33+700	14.970	12.370	0.000	0.000
33+697	14.980	12.370	0.000	0.000
33+694	14.990	12.370	0.000	0.000
33+691	14.990	12.370	0.000	0.000
33+688	14.990	12.370	0.000	0.000
33+685	14.990	12.370	0.000	0.000
33+682	14.990	12.370	0.000	0.000
33+679	14.990	12.370	0.000	0.000
33+676	14.990	12.370	0.000	0.000
33+673	14.990	12.370	0.000	0.000
33+670	14.990	12.370	0.000	0.000
33+667	14.990	12.370	0.000	0.000
33+664	14.990	12.370	0.000	0.000
33+661	14.990	12.370	0.000	0.000
33+658	14.990	12.370	0.000	0.000
33+655	14.990	12.370	0.000	0.000
33+652	14.990	12.370	0.000	0.000
33+649	14.990	12.370	0.000	0.000
33+646	14.990	12.370	0.000	0.000
33+643	14.990	12.370	0.000	0.000
33+640	14.990	12.370	0.000	0.000
33+637	14.990	12.370	0.000	0.000
33+634	14.990	12.370	0.000	0.000
33+631	14.990	12.370	0.000	0.000
33+628	14.990	12.370	0.000	0.000
33+625	14.990	12.370	0.000	0.000
33+622	14.990	12.370	0.000	0.000
33+619	14.990	12.370	0.000	0.000
33+616	14.990	12.370	0.000	0.000
33+613	14.990	12.370	0.000	0.000
33+610	14.990	12.370	0.000	0.000
33+607	14.990	12.370	0.000	0.000
33+604	14.990	12.370	0.000	0.000
33+601	14.990	12.370	0.000	0.000
33+598	14.990	12.370	0.000	0.000
33+595	14.990	12.370	0.000	0.000
33+592	14.990	12.370	0.000	0.000
33+589	14.990	12.370	0.000	0.000
33+586	14.990	12.370	0.000	0.000
33+583	14.990	12.370	0.000	0.000
33+580	14.990	12.370	0.000	0.000
33+577	14.990	12.370	0.000	0.000
33+574	14.990	12.370	0.000	0.000
33+571	14.990	12.370	0.000	0.000
33+568	14.990	12.370	0.000	0.000
33+565	14.990	12.370	0.000	0.000
33+562	14.990	12.370	0.000	0.000
33+559	14.990	12.370	0.000	0.000
33+556	14.990	12.370	0.000	0.000
33+553	14.990	12.370	0.000	0.000
33+550	14.990	12.370	0.000	0.000
33+547	14.990	12.370	0.000	0.000
33+544	14.990	12.370	0.000	0.000
33+541	14.990	12.370	0.000	0.000
33+538	14.990	12.370	0.000	0.000
33+535	14.990	12.370	0.000	0.000
33+532	14.990	12.370	0.000	0.000
33+529	14.990	12.370	0.000	0.000
33+526	14.990	12.370	0.000	0.000
33+523	14.990	12.370	0.000	0.000
33+520	14.990	12.370	0.000	0.000
33+517	14.990	12.370	0.000	0.000
33+514	14.990	12.370	0.000	0.000
33+511	14.990	12.370	0.000	0.000
33+508	14.990	12.370	0.000	0.000
33+505	14.990	12.370	0.000	0.000
33+502	14.990	12.370	0.000	0.000
33+499	14.990	12.370	0.000	0.000
33+496	14.990	12.370	0.000	0.000
33+493	14.990	12.370	0.000	0.000
33+490	14.990	12.370	0.000	0.000
33+487	14.990	12.370	0.000	0.000
33+484	14.990	12.370	0.000	0.000
33+481	14.990	12.370	0.000	0.000
33+478	14.990	12.370	0.000	0.000
33+475	14.990	12.370	0.000	0.000
33+472	14.990	12.370	0.000	0.000
33+469	14.990	12.370	0.000	0.000
33+466	14.990	12.370	0.000	0.000
33+463	14.990	12.370	0.000	0.000
33+460	14.990	12.370	0.000	0.000
33+457	14.990	12.370	0.000	0.000
33+454	14.990	12.370	0.000	0.000
33+451	14.990	12.370	0.000	0.000
33+448	14.990	12.370	0.000	0.000
33+445	14.990	12.370	0.000	0.000
33+442	14.990	12.370	0.000	0.000
33+439	14.990	12.370	0.000	0.000
33+436	14.990	12.370	0.000	0.000
33+433	14.990	12.370	0.000	0.000
33+430	14.990	12.370	0.000	0.000
33+427	14.990	12.370	0.000	0.000
33+424	14.990	12.370	0.000	0.000
33+421	14.990	12.370	0.000	0.000
33+418	14.990	12.370	0.000	0.000
33+415	14.990	12.370	0.000	0.000
33+412	14.990	12.370	0.000	0.000
33+409	14.990	12.370	0.000	0.000
33+406	14.990	12.370	0.000	0.000
33+403	14.990	12.370	0.000	0.000
33+400	14.990	12.370	0.000	0.000

WIDENING AND STRENGTHENING TO TWO LANE
PLAN AND LONGITUDINAL SECTION
JAGATPUR TO DUMURA Km. 33/000 TO Km. 33/770

DATE: 15/01/2011

SCALE: 1:1000

PROJECT NO: 33/000

SECTION NO: 1

DATE: 15/01/2011

SCALE: 1:1000

PROJECT NO: 33/000

SECTION NO: 1

CONSULTANT:
VALECHA ENGINEERING LTD.
PLOT NO. 15, INDUSTRIAL AREA, PHULANESWAR, Bhubaneswar, Odisha

CLIENT:
WORKS DEPT.,
GOVT. OF ODISHA.

PROJECT:
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

DATE: 15/01/2011

SCALE: 1:1000

PROJECT NO: 33/000

SECTION NO: 1

DATE: 15/01/2011

SCALE: 1:1000

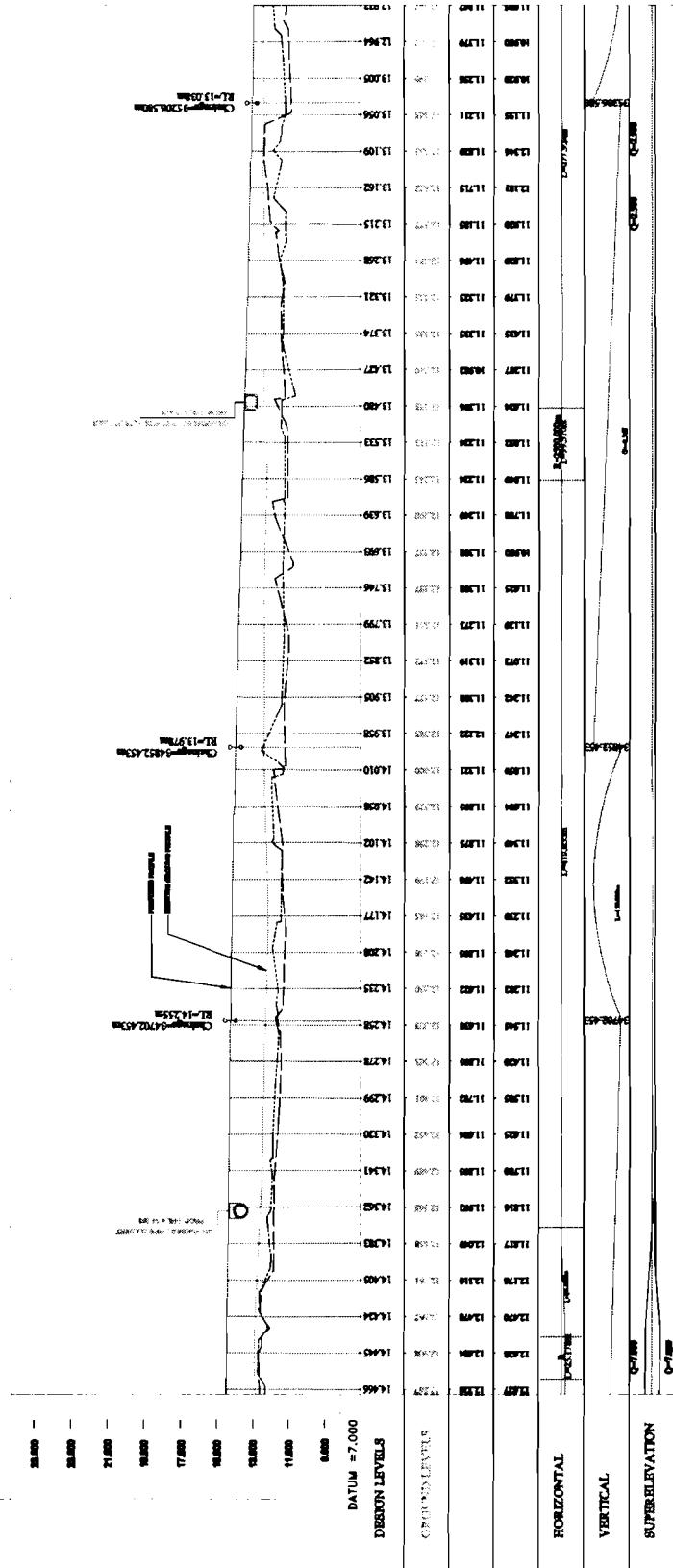
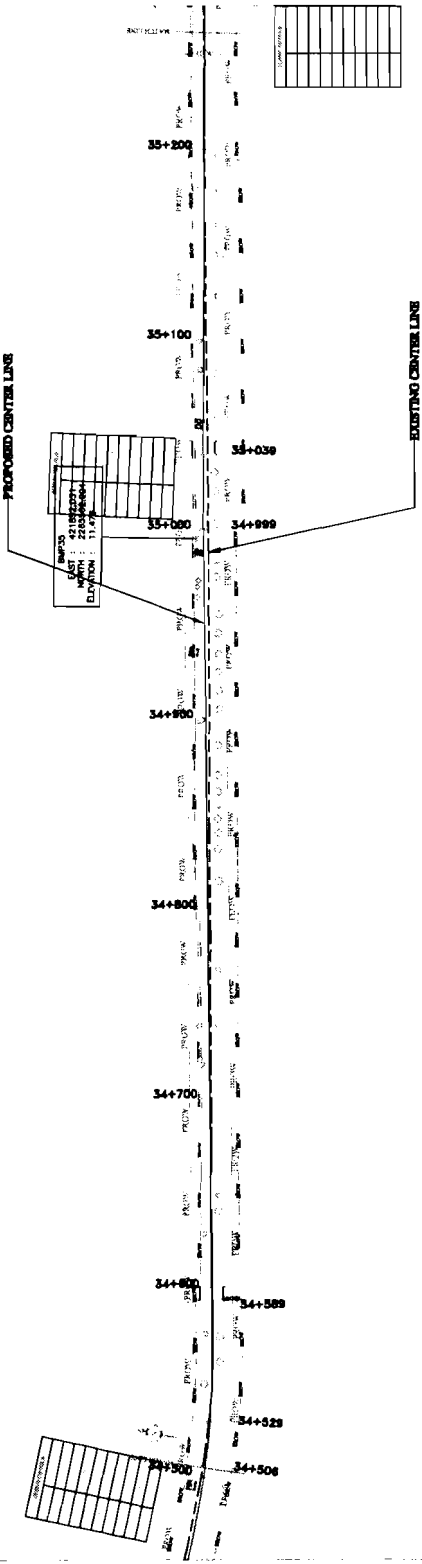
PROJECT NO: 33/000

SECTION NO: 1



TO CHANDBALI →

← TO JAGATPUR



CHAINAGE	SUPERELEVATION	VERTICAL	HORIZONTAL
34+500	0.100	14.66	12.50
34+525	0.100	14.69	12.50
34+550	0.100	14.71	12.50
34+575	0.100	14.73	12.50
34+600	0.100	14.75	12.50
34+625	0.100	14.77	12.50
34+650	0.100	14.79	12.50
34+675	0.100	14.81	12.50
34+700	0.100	14.83	12.50
34+725	0.100	14.85	12.50
34+750	0.100	14.87	12.50
34+775	0.100	14.89	12.50
34+800	0.100	14.91	12.50
34+825	0.100	14.93	12.50
34+850	0.100	14.95	12.50
34+875	0.100	14.97	12.50
34+900	0.100	14.99	12.50
34+925	0.100	15.01	12.50
34+950	0.100	15.03	12.50
34+975	0.100	15.05	12.50
35+000	0.100	15.07	12.50
35+025	0.100	15.09	12.50
35+050	0.100	15.11	12.50
35+075	0.100	15.13	12.50
35+100	0.100	15.15	12.50
35+125	0.100	15.17	12.50
35+150	0.100	15.19	12.50
35+175	0.100	15.21	12.50
35+200	0.100	15.23	12.50

NO. OF SHEETS	NO. OF SHEETS	NO. OF SHEETS	NO. OF SHEETS
1	1	1	1
TOTAL	TOTAL	TOTAL	TOTAL
1	1	1	1

CONSULTANT
ENGINEERS GROUP LTD.
 CONSULTANTS
 10/1, 10/2, 10/3, 10/4, 10/5, 10/6, 10/7, 10/8, 10/9, 10/10, 10/11, 10/12, 10/13, 10/14, 10/15, 10/16, 10/17, 10/18, 10/19, 10/20, 10/21, 10/22, 10/23, 10/24, 10/25, 10/26, 10/27, 10/28, 10/29, 10/30, 10/31, 10/32, 10/33, 10/34, 10/35, 10/36, 10/37, 10/38, 10/39, 10/40, 10/41, 10/42, 10/43, 10/44, 10/45, 10/46, 10/47, 10/48, 10/49, 10/50, 10/51, 10/52, 10/53, 10/54, 10/55, 10/56, 10/57, 10/58, 10/59, 10/60, 10/61, 10/62, 10/63, 10/64, 10/65, 10/66, 10/67, 10/68, 10/69, 10/70, 10/71, 10/72, 10/73, 10/74, 10/75, 10/76, 10/77, 10/78, 10/79, 10/80, 10/81, 10/82, 10/83, 10/84, 10/85, 10/86, 10/87, 10/88, 10/89, 10/90, 10/91, 10/92, 10/93, 10/94, 10/95, 10/96, 10/97, 10/98, 10/99, 10/100

CLIENT
WORKS DEPT.
GOVT. OF ODISHA

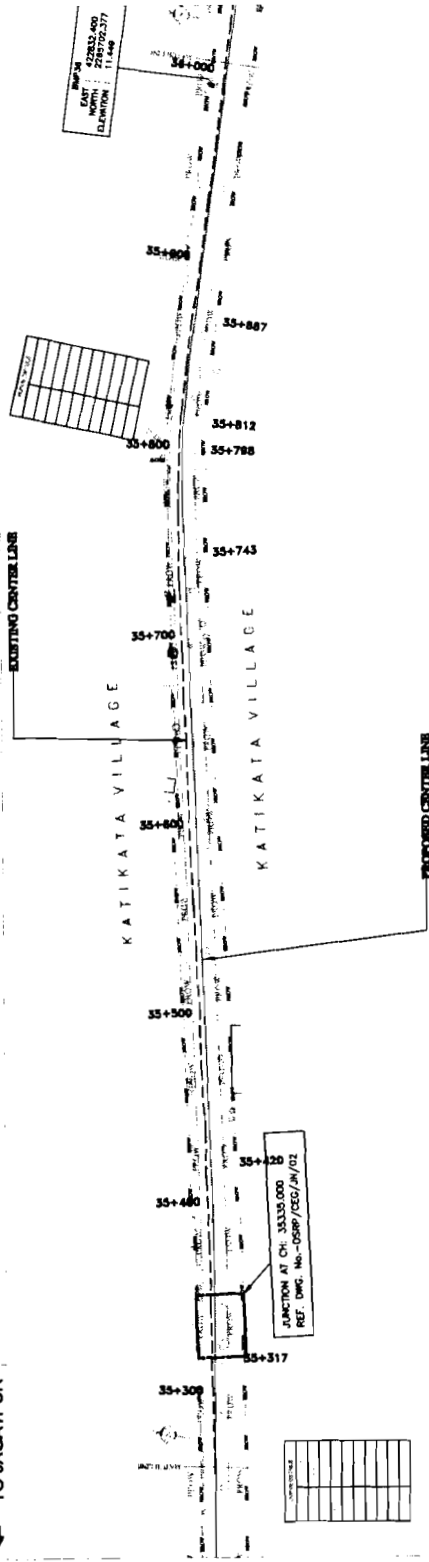
PROJECT
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

DATE OF SHEET	NO. OF SHEETS	NO. OF SHEETS	NO. OF SHEETS
1	1	1	1
TOTAL	TOTAL	TOTAL	TOTAL
1	1	1	1



TO CHANDBALI →

← TO JAGATPUR



CHAINSAGE	SUPERELEVATION	VERTICAL	HORIZONTAL	GROUND LEVELS	DESIGN LEVELS
35+309	11.800	11.800	12.912	12.912	12.912
35+310	11.800	11.800	12.913	12.913	12.913
35+311	11.800	11.800	12.914	12.914	12.914
35+312	11.800	11.800	12.915	12.915	12.915
35+313	11.800	11.800	12.916	12.916	12.916
35+314	11.800	11.800	12.917	12.917	12.917
35+315	11.800	11.800	12.918	12.918	12.918
35+316	11.800	11.800	12.919	12.919	12.919
35+317	11.800	11.800	12.920	12.920	12.920
35+318	11.800	11.800	12.921	12.921	12.921
35+319	11.800	11.800	12.922	12.922	12.922
35+320	11.800	11.800	12.923	12.923	12.923
35+321	11.800	11.800	12.924	12.924	12.924
35+322	11.800	11.800	12.925	12.925	12.925
35+323	11.800	11.800	12.926	12.926	12.926
35+324	11.800	11.800	12.927	12.927	12.927
35+325	11.800	11.800	12.928	12.928	12.928
35+326	11.800	11.800	12.929	12.929	12.929
35+327	11.800	11.800	12.930	12.930	12.930
35+328	11.800	11.800	12.931	12.931	12.931
35+329	11.800	11.800	12.932	12.932	12.932
35+330	11.800	11.800	12.933	12.933	12.933
35+331	11.800	11.800	12.934	12.934	12.934
35+332	11.800	11.800	12.935	12.935	12.935
35+333	11.800	11.800	12.936	12.936	12.936
35+334	11.800	11.800	12.937	12.937	12.937
35+335	11.800	11.800	12.938	12.938	12.938
35+336	11.800	11.800	12.939	12.939	12.939
35+337	11.800	11.800	12.940	12.940	12.940
35+338	11.800	11.800	12.941	12.941	12.941
35+339	11.800	11.800	12.942	12.942	12.942
35+340	11.800	11.800	12.943	12.943	12.943
35+341	11.800	11.800	12.944	12.944	12.944
35+342	11.800	11.800	12.945	12.945	12.945
35+343	11.800	11.800	12.946	12.946	12.946
35+344	11.800	11.800	12.947	12.947	12.947
35+345	11.800	11.800	12.948	12.948	12.948
35+346	11.800	11.800	12.949	12.949	12.949
35+347	11.800	11.800	12.950	12.950	12.950
35+348	11.800	11.800	12.951	12.951	12.951
35+349	11.800	11.800	12.952	12.952	12.952
35+350	11.800	11.800	12.953	12.953	12.953
35+351	11.800	11.800	12.954	12.954	12.954
35+352	11.800	11.800	12.955	12.955	12.955
35+353	11.800	11.800	12.956	12.956	12.956
35+354	11.800	11.800	12.957	12.957	12.957
35+355	11.800	11.800	12.958	12.958	12.958
35+356	11.800	11.800	12.959	12.959	12.959
35+357	11.800	11.800	12.960	12.960	12.960
35+358	11.800	11.800	12.961	12.961	12.961
35+359	11.800	11.800	12.962	12.962	12.962
35+360	11.800	11.800	12.963	12.963	12.963
35+361	11.800	11.800	12.964	12.964	12.964
35+362	11.800	11.800	12.965	12.965	12.965
35+363	11.800	11.800	12.966	12.966	12.966
35+364	11.800	11.800	12.967	12.967	12.967
35+365	11.800	11.800	12.968	12.968	12.968
35+366	11.800	11.800	12.969	12.969	12.969
35+367	11.800	11.800	12.970	12.970	12.970
35+368	11.800	11.800	12.971	12.971	12.971
35+369	11.800	11.800	12.972	12.972	12.972
35+370	11.800	11.800	12.973	12.973	12.973
35+371	11.800	11.800	12.974	12.974	12.974
35+372	11.800	11.800	12.975	12.975	12.975
35+373	11.800	11.800	12.976	12.976	12.976
35+374	11.800	11.800	12.977	12.977	12.977
35+375	11.800	11.800	12.978	12.978	12.978
35+376	11.800	11.800	12.979	12.979	12.979
35+377	11.800	11.800	12.980	12.980	12.980
35+378	11.800	11.800	12.981	12.981	12.981
35+379	11.800	11.800	12.982	12.982	12.982
35+380	11.800	11.800	12.983	12.983	12.983
35+381	11.800	11.800	12.984	12.984	12.984
35+382	11.800	11.800	12.985	12.985	12.985
35+383	11.800	11.800	12.986	12.986	12.986
35+384	11.800	11.800	12.987	12.987	12.987
35+385	11.800	11.800	12.988	12.988	12.988
35+386	11.800	11.800	12.989	12.989	12.989
35+387	11.800	11.800	12.990	12.990	12.990
35+388	11.800	11.800	12.991	12.991	12.991
35+389	11.800	11.800	12.992	12.992	12.992
35+390	11.800	11.800	12.993	12.993	12.993
35+391	11.800	11.800	12.994	12.994	12.994
35+392	11.800	11.800	12.995	12.995	12.995
35+393	11.800	11.800	12.996	12.996	12.996
35+394	11.800	11.800	12.997	12.997	12.997
35+395	11.800	11.800	12.998	12.998	12.998
35+396	11.800	11.800	12.999	12.999	12.999
35+397	11.800	11.800	13.000	13.000	13.000

WIDENING AND STRENGTHENING TO TWO LANE PLAN AND LONGITUDINAL SECTION
JAGATPUR TO DURBA Km.35280 TO Km.36000

CONSULTANT:-
CONSTRUCTING ENGINEERS GROUP LTD.
 12, Laxmi Colony Market, Bhubaneswar - 751005
 Ph: 0674-2522222, 2522223, 2522224, 2522225, 2522226
 Fax: 0674-2522227, 2522228, 2522229, 2522230
 E-mail: conengr@rediffmail.com

CLIENT:-
WORKS DEPT., GOVT. OF ODISHA.

PROJECT:-
ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE

DATE: 15.08.2017

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

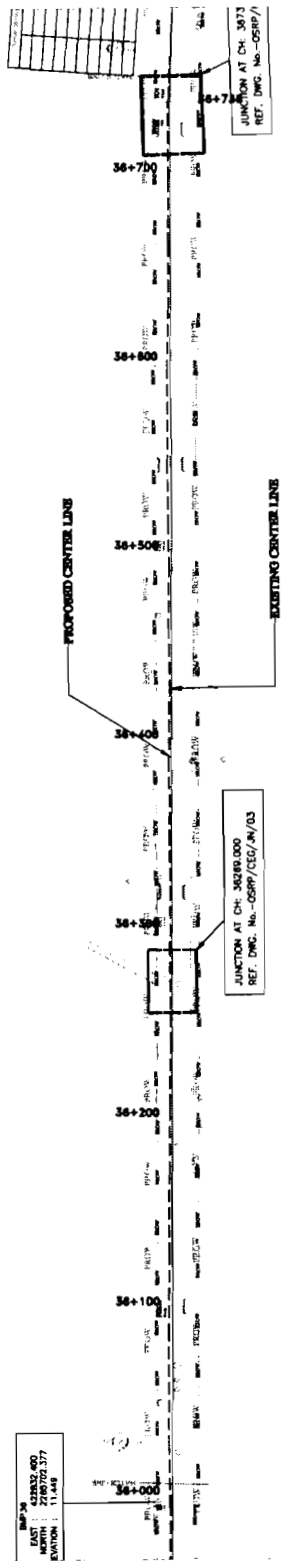
DESIGNER: [Signature]

CHECKED: [Signature]

APPROVED: [Signature]

TO CHANDBALI →

← TO JAGATPUR



EAST : 62832.400
NORTH : 226702.377
ELEVATION : 11.448

STATION	GROUND LEVEL	PROPOSED LEVEL	VERTICAL CURVE DATA
36+700	13.524	13.524	
36+690	13.532	13.532	
36+680	13.530	13.530	
36+670	13.528	13.528	
36+660	13.526	13.526	
36+650	13.524	13.524	
36+640	13.522	13.522	
36+630	13.520	13.520	
36+620	13.519	13.519	
36+610	13.517	13.517	
36+600	13.515	13.515	
36+590	13.513	13.513	
36+580	13.511	13.511	
36+570	13.509	13.509	
36+560	13.507	13.507	
36+550	13.505	13.505	
36+540	13.503	13.503	
36+530	13.501	13.501	
36+520	13.499	13.499	
36+510	13.497	13.497	
36+500	13.495	13.495	
36+490	13.493	13.493	
36+480	13.491	13.491	
36+470	13.489	13.489	
36+460	13.487	13.487	
36+450	13.485	13.485	
36+440	13.483	13.483	
36+430	13.481	13.481	
36+420	13.479	13.479	
36+410	13.477	13.477	
36+400	13.475	13.475	
36+390	13.473	13.473	
36+380	13.471	13.471	
36+370	13.469	13.469	
36+360	13.467	13.467	
36+350	13.465	13.465	
36+340	13.463	13.463	
36+330	13.461	13.461	
36+320	13.459	13.459	
36+310	13.457	13.457	
36+300	13.455	13.455	
36+290	13.453	13.453	
36+280	13.451	13.451	
36+270	13.449	13.449	
36+260	13.447	13.447	
36+250	13.445	13.445	
36+240	13.443	13.443	
36+230	13.441	13.441	
36+220	13.439	13.439	
36+210	13.437	13.437	
36+200	13.435	13.435	
36+190	13.433	13.433	
36+180	13.431	13.431	
36+170	13.429	13.429	
36+160	13.427	13.427	
36+150	13.425	13.425	
36+140	13.423	13.423	
36+130	13.421	13.421	
36+120	13.419	13.419	
36+110	13.417	13.417	
36+100	13.415	13.415	
36+090	13.413	13.413	
36+080	13.411	13.411	
36+070	13.409	13.409	
36+060	13.407	13.407	
36+050	13.405	13.405	
36+040	13.403	13.403	
36+030	13.401	13.401	
36+020	13.399	13.399	
36+010	13.397	13.397	
36+000	13.395	13.395	

STATION	GROUND LEVEL	PROPOSED LEVEL	VERTICAL CURVE DATA
36+000	13.395	13.395	
36+010	13.397	13.397	
36+020	13.399	13.399	
36+030	13.401	13.401	
36+040	13.403	13.403	
36+050	13.405	13.405	
36+060	13.407	13.407	
36+070	13.409	13.409	
36+080	13.411	13.411	
36+090	13.413	13.413	
36+100	13.415	13.415	
36+110	13.417	13.417	
36+120	13.419	13.419	
36+130	13.421	13.421	
36+140	13.423	13.423	
36+150	13.425	13.425	
36+160	13.427	13.427	
36+170	13.429	13.429	
36+180	13.431	13.431	
36+190	13.433	13.433	
36+200	13.435	13.435	
36+210	13.437	13.437	
36+220	13.439	13.439	
36+230	13.441	13.441	
36+240	13.443	13.443	
36+250	13.445	13.445	
36+260	13.447	13.447	
36+270	13.449	13.449	
36+280	13.451	13.451	
36+290	13.453	13.453	
36+300	13.455	13.455	
36+310	13.457	13.457	
36+320	13.459	13.459	
36+330	13.461	13.461	
36+340	13.463	13.463	
36+350	13.465	13.465	
36+360	13.467	13.467	
36+370	13.469	13.469	
36+380	13.471	13.471	
36+390	13.473	13.473	
36+400	13.475	13.475	
36+410	13.477	13.477	
36+420	13.479	13.479	
36+430	13.481	13.481	
36+440	13.483	13.483	
36+450	13.485	13.485	
36+460	13.487	13.487	
36+470	13.489	13.489	
36+480	13.491	13.491	
36+490	13.493	13.493	
36+500	13.495	13.495	
36+510	13.497	13.497	
36+520	13.499	13.499	
36+530	13.501	13.501	
36+540	13.503	13.503	
36+550	13.505	13.505	
36+560	13.507	13.507	
36+570	13.509	13.509	
36+580	13.511	13.511	
36+590	13.513	13.513	
36+600	13.515	13.515	
36+610	13.517	13.517	
36+620	13.519	13.519	
36+630	13.522	13.522	
36+640	13.524	13.524	
36+650	13.526	13.526	
36+660	13.528	13.528	
36+670	13.530	13.530	
36+680	13.532	13.532	
36+690	13.534	13.534	
36+700	13.536	13.536	

WIDENING AND STRENGTHENING TO TWO LANE PLAN AND LONGITUDINAL SECTION JAGATPUR TO DUMARA Km. 36000 TO Km. 36700

CONSULTANT: COMBUSTION ENGINEERS GROUP LTD.

CLIENT: WORKS DEPT. GOVT. OF ODISHA.

PROJECT: ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE

DATE: 15/05/2011

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

DESIGNER: [Signature]

CHECKED: [Signature]

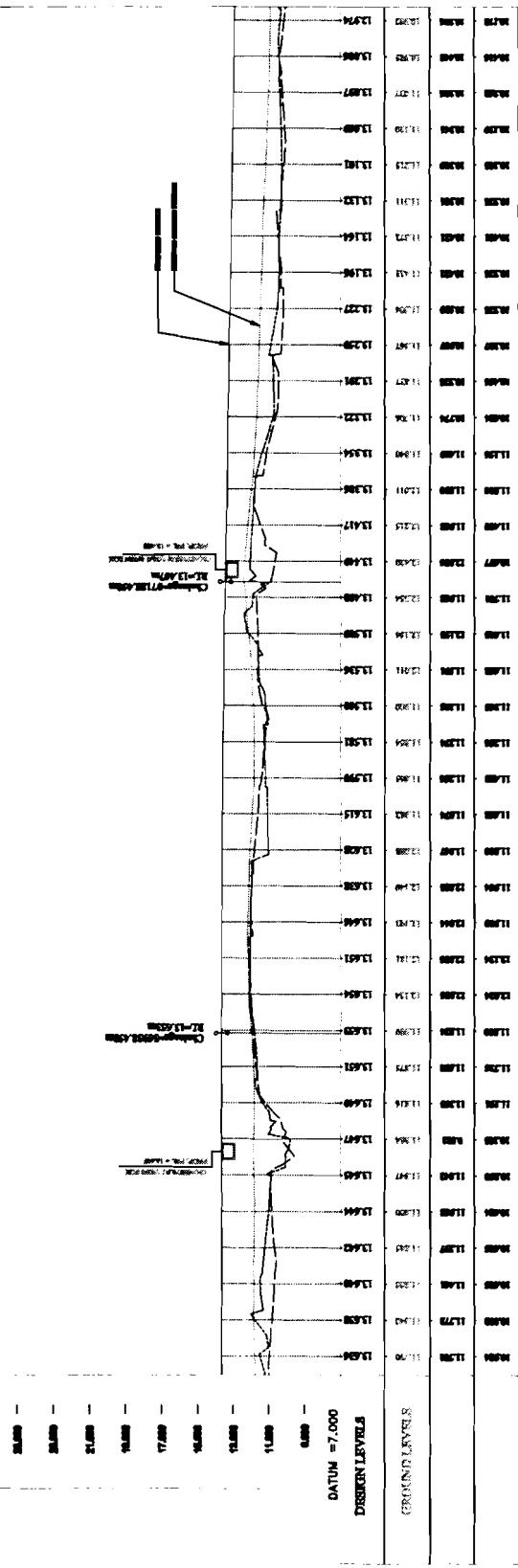
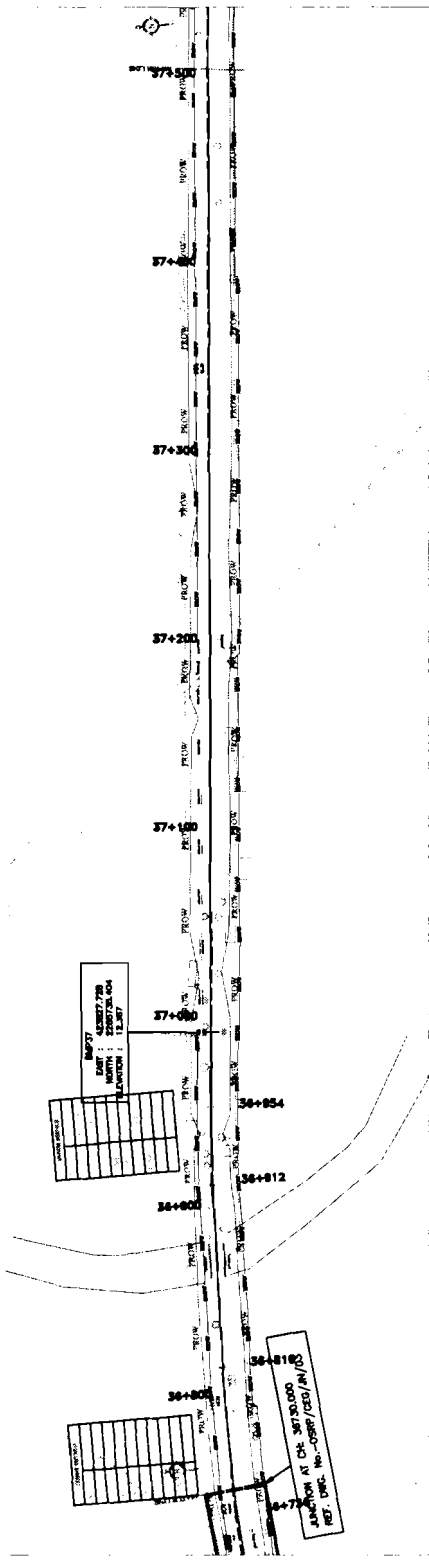
DATE: 15/05/2011

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



TO CHANDRAL →

← TO JAGATPUR



Station	Ground Level	Design Level	Super Elevation
36+000	12.50	12.50	0.00
36+010	12.50	12.50	0.00
36+020	12.50	12.50	0.00
36+030	12.50	12.50	0.00
36+040	12.50	12.50	0.00
36+050	12.50	12.50	0.00
36+060	12.50	12.50	0.00
36+070	12.50	12.50	0.00
36+080	12.50	12.50	0.00
36+090	12.50	12.50	0.00
36+100	12.50	12.50	0.00
36+110	12.50	12.50	0.00
36+120	12.50	12.50	0.00
36+130	12.50	12.50	0.00
36+140	12.50	12.50	0.00
36+150	12.50	12.50	0.00
36+160	12.50	12.50	0.00
36+170	12.50	12.50	0.00
36+180	12.50	12.50	0.00
36+190	12.50	12.50	0.00
36+200	12.50	12.50	0.00
36+210	12.50	12.50	0.00
36+220	12.50	12.50	0.00
36+230	12.50	12.50	0.00
36+240	12.50	12.50	0.00
36+250	12.50	12.50	0.00
36+260	12.50	12.50	0.00
36+270	12.50	12.50	0.00
36+280	12.50	12.50	0.00
36+290	12.50	12.50	0.00
36+300	12.50	12.50	0.00
36+310	12.50	12.50	0.00
36+320	12.50	12.50	0.00
36+330	12.50	12.50	0.00
36+340	12.50	12.50	0.00
36+350	12.50	12.50	0.00
36+360	12.50	12.50	0.00
36+370	12.50	12.50	0.00
36+380	12.50	12.50	0.00
36+390	12.50	12.50	0.00
36+400	12.50	12.50	0.00
36+410	12.50	12.50	0.00
36+420	12.50	12.50	0.00
36+430	12.50	12.50	0.00
36+440	12.50	12.50	0.00
36+450	12.50	12.50	0.00
36+460	12.50	12.50	0.00
36+470	12.50	12.50	0.00
36+480	12.50	12.50	0.00
36+490	12.50	12.50	0.00
36+500	12.50	12.50	0.00

WIDENING AND STRENGTHENING TO TWO LANE PLAN AND LONGITUDINAL SECTION
JAGATPUR TO DUMARA Km.36780 TO Km.37800

CONSULTANT:-
COMSULTING ENGINEERS GROUP LTD.
 11, 12 & 13, Corporation Road, Jagatpur
 Ph. No. 42-111-2200/2201/2202/2203/2204
 Fax. No. 221116, e-mail: comsulting@rediffmail.com

CLIENT:-
WORKS DEPT., GOVT. OF ODISHA

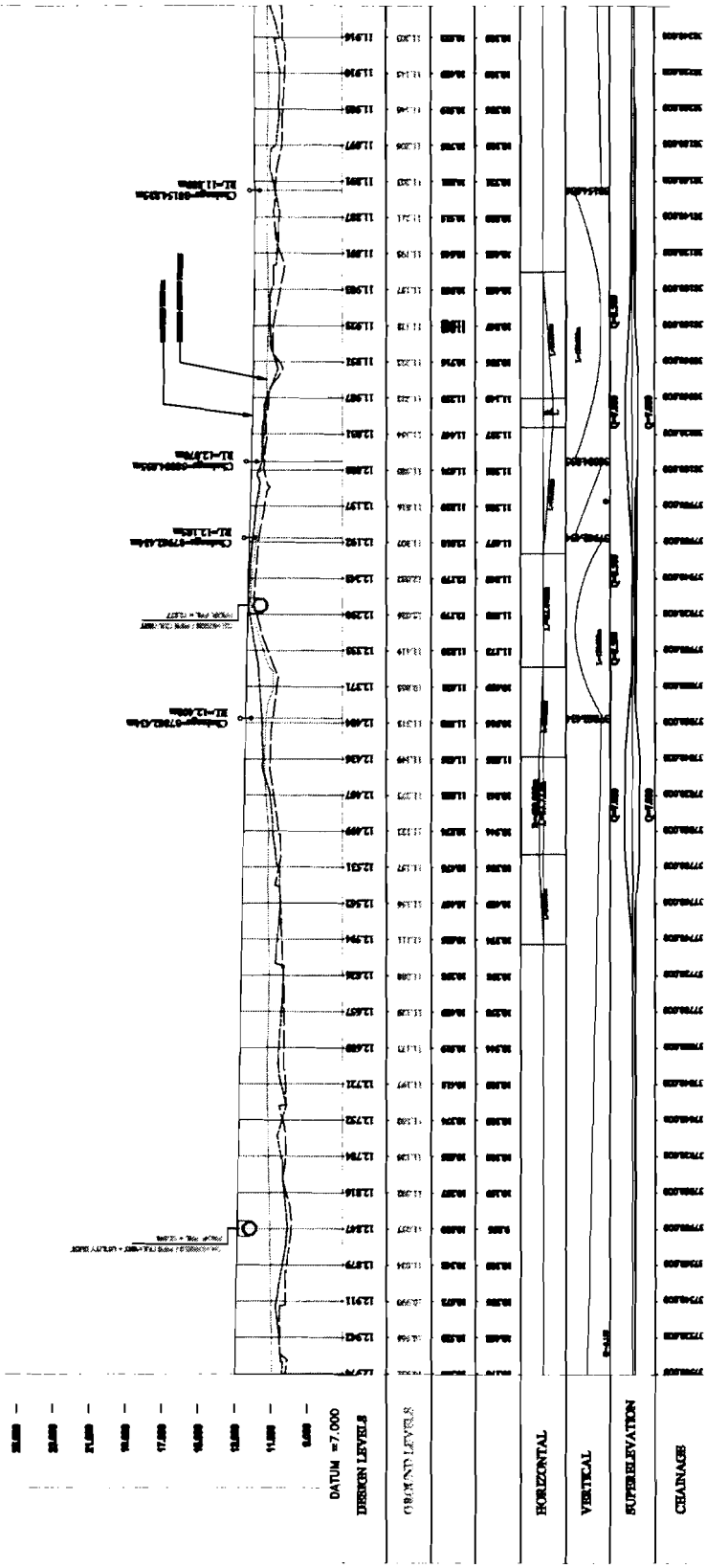
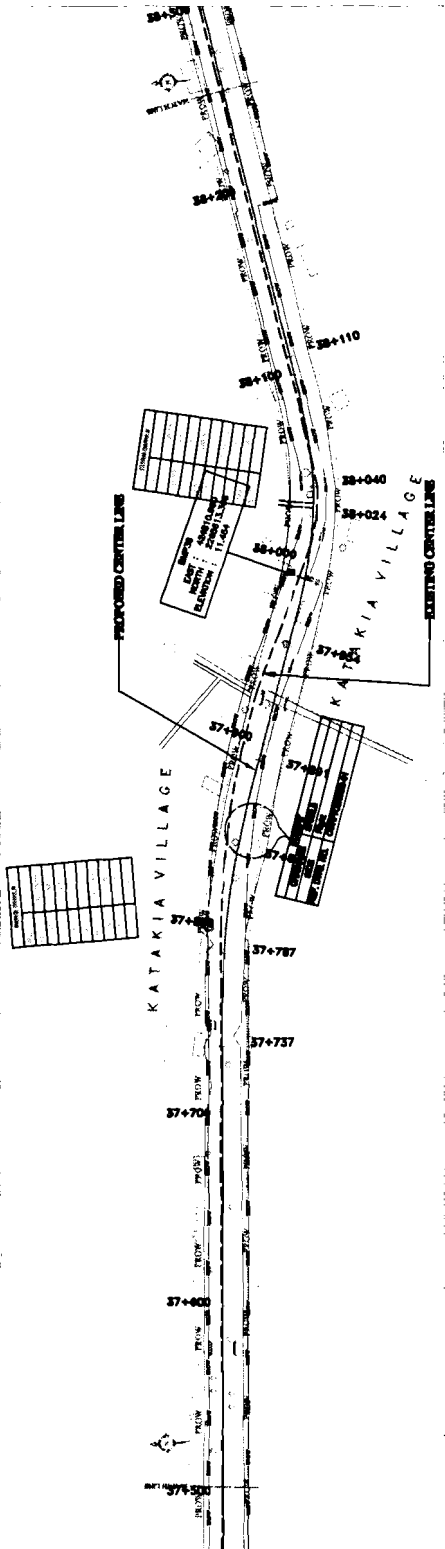
PROJECT:-
 ODISHA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE

DATE: 15/05/2005
SCALE: 1:1000
PROJECT NO.: 15/05/2005/15/05/05
DESIGN NO.: 15/05/2005/15/05/05
DATE OF ISSUE: 15/05/2005
ISSUED BY: [Signature]
CHECKED BY: [Signature]
APPROVED BY: [Signature]



TO CHANDRALI →

← TO JAGATPUR



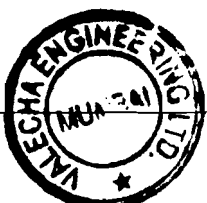
CONSULTANT:
CEG CONSULTING ENGINEERS GROUP LTD.
 12/60, Chhatrapati Shivaji Maharaj Marg, Jabalpur - 481001
 Ph: 491-41-42/43/44/45/46/47/48/49/50/51/52/53/54/55/56/57/58/59/60/61/62/63/64/65/66/67/68/69/70/71/72/73/74/75/76/77/78/79/80/81/82/83/84/85/86/87/88/89/90/91/92/93/94/95/96/97/98/99/100

CLIENT:
WORKS DEPT. GOVT. OF ORISSA

PROJECT:
ORISSA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE

WIDENING AND STRENGTHENING TO TWO LANE PLAN AND LONGITUDINAL SECTION JAGATPUR TO DUFURA Km.37/600 TO Km.38/200

DATE: 15/05/2011
SCALE: HORIZONTAL: 1:1000 VERTICAL: 1:100





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

NO.	DESCRIPTION	DATE	BY	CHECKED BY
1	Issue for tender	10/11/2010	A.S.	A.S.
2	Issue for contract	10/11/2010	A.S.	A.S.
3	Issue for contract	10/11/2010	A.S.	A.S.
4	Issue for contract	10/11/2010	A.S.	A.S.
5	Issue for contract	10/11/2010	A.S.	A.S.
6	Issue for contract	10/11/2010	A.S.	A.S.
7	Issue for contract	10/11/2010	A.S.	A.S.
8	Issue for contract	10/11/2010	A.S.	A.S.
9	Issue for contract	10/11/2010	A.S.	A.S.
10	Issue for contract	10/11/2010	A.S.	A.S.

NO.	DESCRIPTION	DATE	BY	CHECKED BY
1	Issue for contract	10/11/2010	A.S.	A.S.
2	Issue for contract	10/11/2010	A.S.	A.S.
3	Issue for contract	10/11/2010	A.S.	A.S.
4	Issue for contract	10/11/2010	A.S.	A.S.
5	Issue for contract	10/11/2010	A.S.	A.S.
6	Issue for contract	10/11/2010	A.S.	A.S.
7	Issue for contract	10/11/2010	A.S.	A.S.
8	Issue for contract	10/11/2010	A.S.	A.S.
9	Issue for contract	10/11/2010	A.S.	A.S.
10	Issue for contract	10/11/2010	A.S.	A.S.

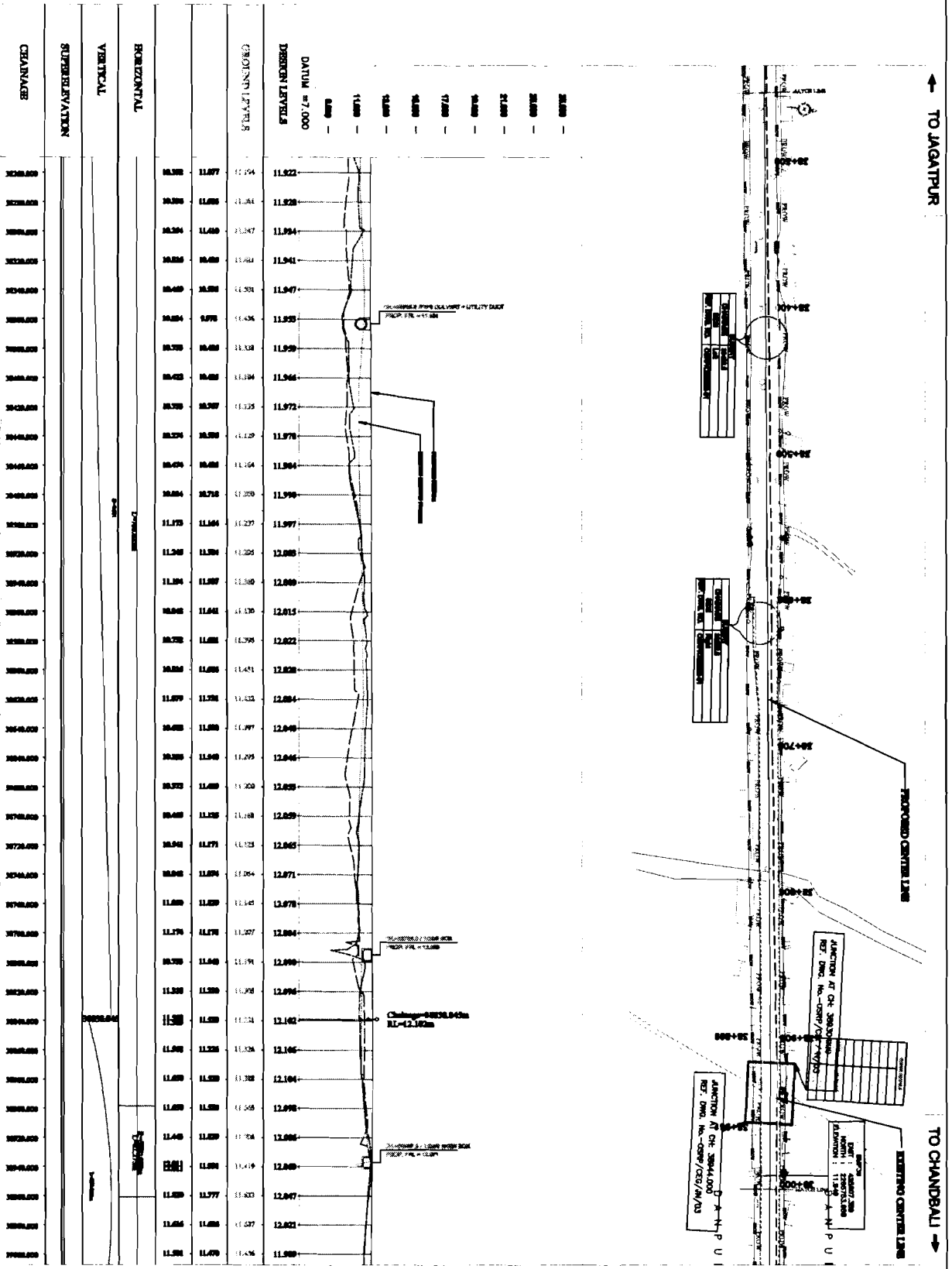
PROJECT:
ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

CLIENT:
WORKS DEPT.
GOVT. OF ORISSA

CONSULTANT:
C. O. M. S. U. L. T. I. M. S.
ENGINEERS AND ARCHTS.
11/11/2010, Chandrasekhar Nagar, Bhubaneswar-751013
Ph: +91-674-2527000, 2527001, 2527002
Fax: +91-674-2527003, 2527004, 2527005
www.comsulmitms.com

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

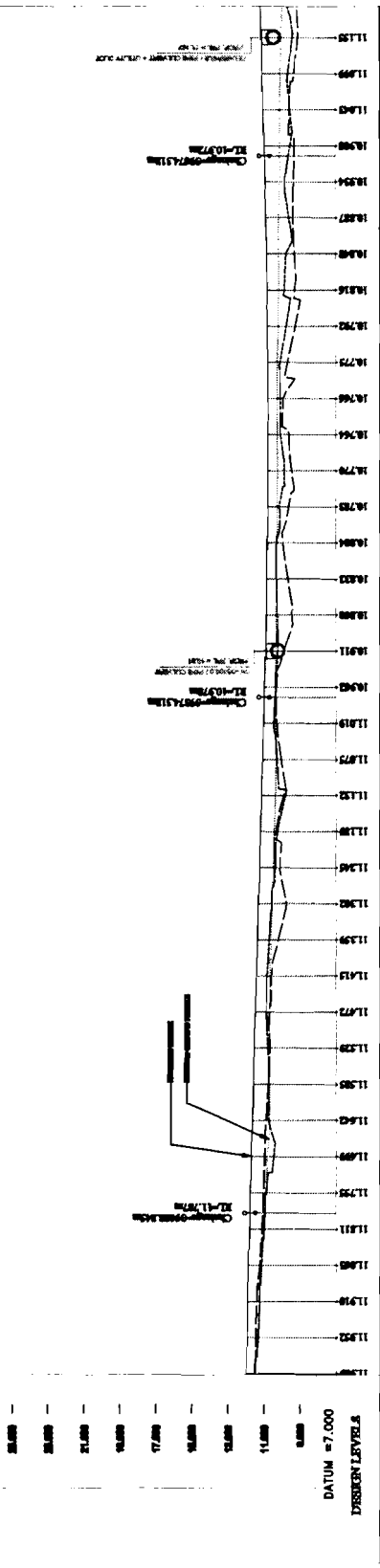
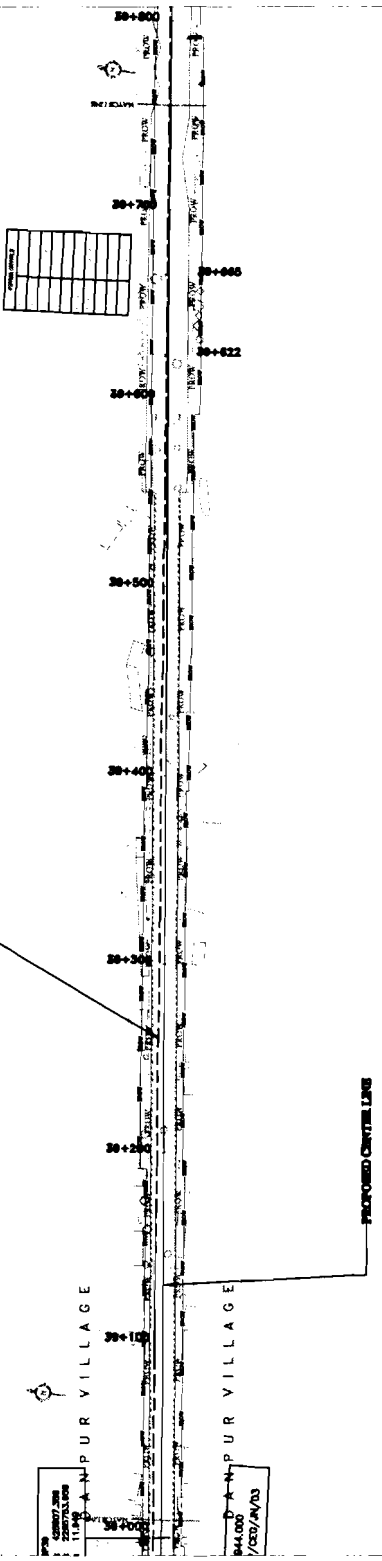
NO.	DESCRIPTION	DATE	BY	CHECKED BY
1	Issue for contract	10/11/2010	A.S.	A.S.
2	Issue for contract	10/11/2010	A.S.	A.S.
3	Issue for contract	10/11/2010	A.S.	A.S.
4	Issue for contract	10/11/2010	A.S.	A.S.
5	Issue for contract	10/11/2010	A.S.	A.S.
6	Issue for contract	10/11/2010	A.S.	A.S.
7	Issue for contract	10/11/2010	A.S.	A.S.
8	Issue for contract	10/11/2010	A.S.	A.S.
9	Issue for contract	10/11/2010	A.S.	A.S.
10	Issue for contract	10/11/2010	A.S.	A.S.



CHAINAGE	GROUND LEVEL	PROPOSED LEVEL	VERTICAL CURVE DATA
0+00	11.97	11.97	
1+00	11.97	11.97	
2+00	11.97	11.97	
3+00	11.97	11.97	
4+00	11.97	11.97	
5+00	11.97	11.97	
6+00	11.97	11.97	
7+00	11.97	11.97	
8+00	11.97	11.97	
9+00	11.97	11.97	
10+00	11.97	11.97	
11+00	11.97	11.97	
12+00	11.97	11.97	
13+00	11.97	11.97	
14+00	11.97	11.97	
15+00	11.97	11.97	
16+00	11.97	11.97	
17+00	11.97	11.97	
18+00	11.97	11.97	
19+00	11.97	11.97	
20+00	11.97	11.97	
21+00	11.97	11.97	
22+00	11.97	11.97	
23+00	11.97	11.97	
24+00	11.97	11.97	
25+00	11.97	11.97	
26+00	11.97	11.97	
27+00	11.97	11.97	
28+00	11.97	11.97	
29+00	11.97	11.97	
30+00	11.97	11.97	
31+00	11.97	11.97	
32+00	11.97	11.97	
33+00	11.97	11.97	
34+00	11.97	11.97	
35+00	11.97	11.97	
36+00	11.97	11.97	
37+00	11.97	11.97	
38+00	11.97	11.97	
39+00	11.97	11.97	
40+00	11.97	11.97	
41+00	11.97	11.97	
42+00	11.97	11.97	
43+00	11.97	11.97	
44+00	11.97	11.97	
45+00	11.97	11.97	
46+00	11.97	11.97	
47+00	11.97	11.97	
48+00	11.97	11.97	
49+00	11.97	11.97	
50+00	11.97	11.97	

TO CHANDBALI →

← TO JAGATPUR



STATION	GROUND LEVEL	PROPOSED LEVEL	VERTICAL CURVE DATA
20+00	11.80	11.80	
20+05	11.85	11.85	
20+10	11.90	11.90	
20+15	11.95	11.95	
20+20	12.00	12.00	
20+25	12.05	12.05	
20+30	12.10	12.10	
20+35	12.15	12.15	
20+40	12.20	12.20	
20+45	12.25	12.25	
20+50	12.30	12.30	
20+55	12.35	12.35	
20+60	12.40	12.40	
20+65	12.45	12.45	
20+70	12.50	12.50	
20+75	12.55	12.55	
20+80	12.60	12.60	

CLIENT: WORKS DEPT. GOVT. OF ORISSA

PROJECT: ORISSA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE

CONSULTANT: CONSULTANTS ENGINEERS GROUP LTD. (C.E.G.L.)

WORKING AND STRENGTHENING TO TWO LANE PLAN AND LONGITUDINAL SECTION JAGATPUR TO DULHURA Km.38000 TO Km.39700

DATE: 15/05/2011

SCALE: HORIZONTAL: 1:5000 VERTICAL: 1:1000

DESIGNED BY: [Signature]

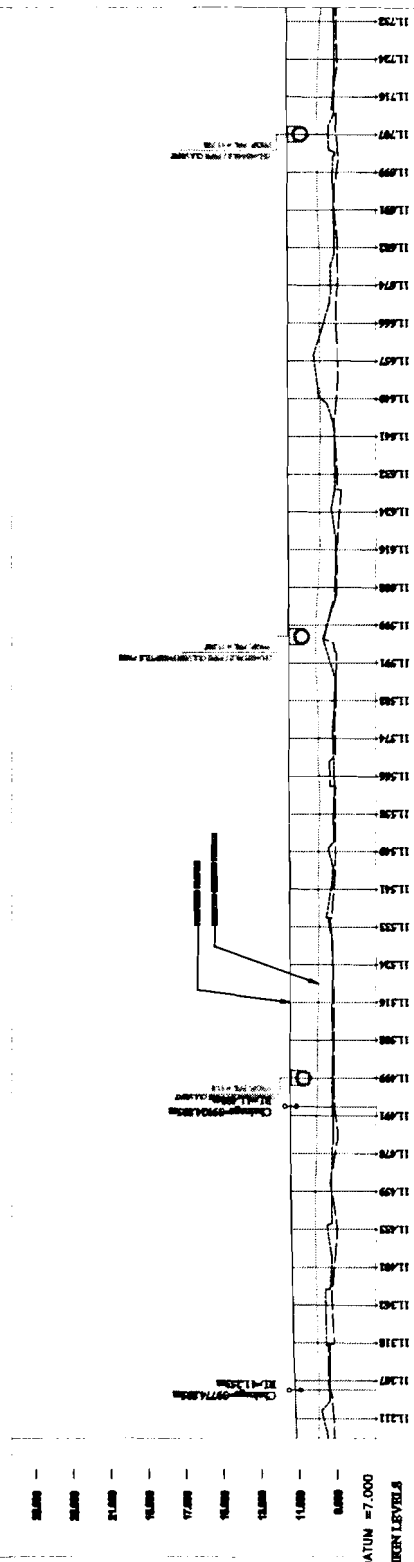
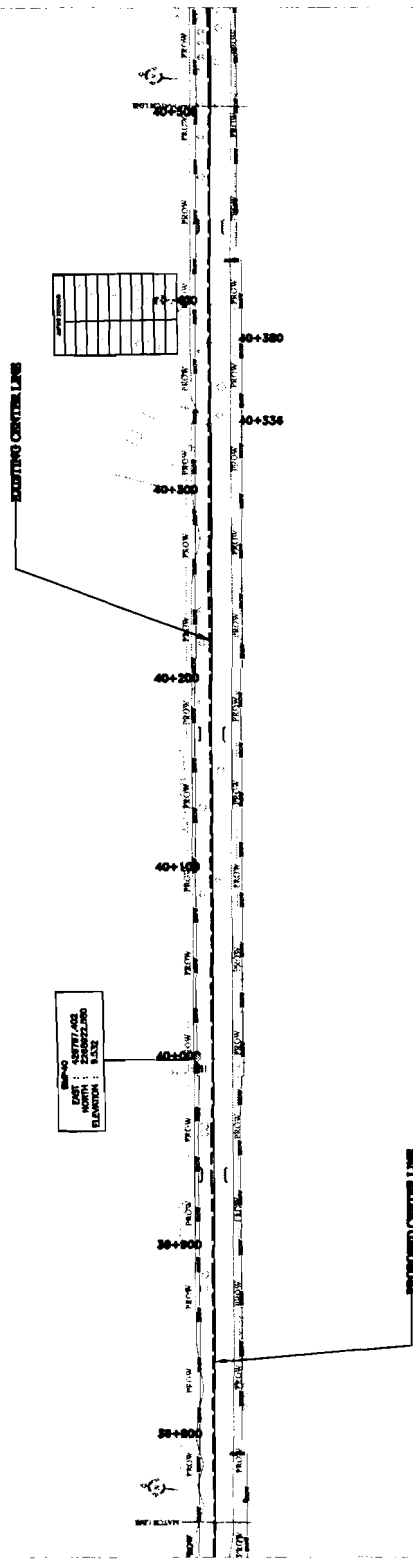
CHECKED BY: [Signature]

DATE: 15/05/2011



TO CHANDBALI →

← TO JAGATPUR



STATION	GROUND LEVEL	DESIGN LEVEL	VERTICAL CURVE DATA	CHANGAPOLARIS
40+000	11.211	11.211		
40+010	11.277	11.277		
40+020	11.304	11.304		
40+030	11.318	11.318		
40+040	11.320	11.320		
40+050	11.317	11.317		
40+060	11.303	11.303		
40+070	11.279	11.279		
40+080	11.244	11.244		
40+090	11.199	11.199		
40+100	11.144	11.144		
40+110	11.079	11.079		
40+120	11.004	11.004		
40+130	10.919	10.919		
40+140	10.824	10.824		
40+150	10.719	10.719		
40+160	10.604	10.604		
40+170	10.479	10.479		
40+180	10.344	10.344		
40+190	10.199	10.199		
40+200	10.044	10.044		
40+210	9.879	9.879		
40+220	9.704	9.704		
40+230	9.519	9.519		
40+240	9.324	9.324		
40+250	9.119	9.119		
40+260	8.904	8.904		
40+270	8.679	8.679		
40+280	8.444	8.444		
40+290	8.199	8.199		
40+300	7.944	7.944		
40+310	7.679	7.679		
40+320	7.404	7.404		
40+330	7.119	7.119		
40+340	6.824	6.824		
40+350	6.519	6.519		
40+360	6.204	6.204		
40+370	5.879	5.879		
40+380	5.544	5.544		
40+390	5.199	5.199		
40+400	4.844	4.844		
40+410	4.479	4.479		
40+420	4.104	4.104		
40+430	3.719	3.719		
40+440	3.324	3.324		
40+450	2.919	2.919		
40+460	2.504	2.504		
40+470	2.079	2.079		
40+480	1.644	1.644		
40+490	1.199	1.199		
40+500	0.744	0.744		
40+510	0.279	0.279		
40+520	-0.204	-0.204		
40+530	-0.729	-0.729		
40+540	-1.204	-1.204		
40+550	-1.629	-1.629		

LEGEND

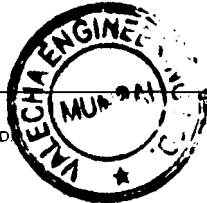
EXISTING CENTERLINE
PROPOSED CENTERLINE

PROJECT: ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE

CLIENT: WORKS DEPT. GOVT. OF ODISHA

CONSULTANT: CONSULTING ENGINEERS GROUP LTD. (A MEMBER FIRM OF THE CONSULTING ENGINEERS GROUP LTD.)

WIDENING AND STRENGTHENING TO TWO LANE PLAN AND LONGITUDINAL SECTION JAGATPUR TO DULERA Km. 38/750 TO Km.40/000



VALECHA ENGINEERING LTD. Contractor

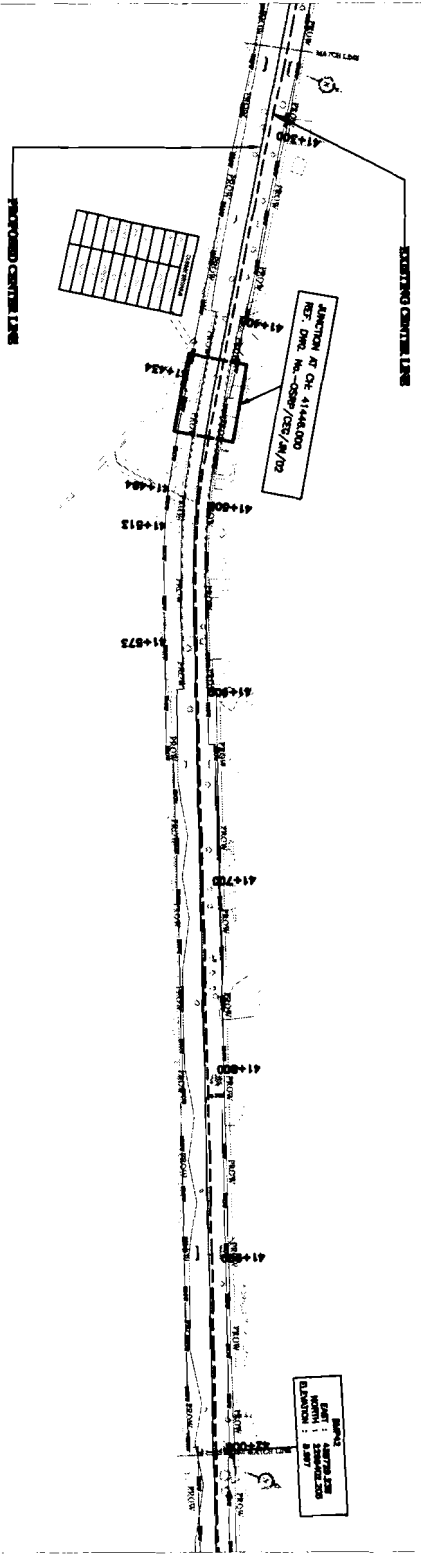
Chief Engineer,
World Bank Project
Odisha
Govt. of Odisha,
Rhubaneswar.



Chief Engineer
Mumbai
Worldwide
the E.C.C. (Civil) Office
Bhubaneswar

← TO JAGTIPUR

TO CHANDBALI →



STATION	11+00	11+05	11+10	11+15	11+20	11+25	11+30	11+35	11+40	11+45	11+50	11+55	11+60	11+65	11+70	11+75	11+80	11+85	11+90	11+95	12+00
GEOMETRIC LEVELS	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240
DATA = 7.000	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240
DESIGN LEVELS	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240	10.240
HORIZONTAL																					
VERTICAL																					
SUPER ELEVATION																					
CHANGES																					

PROJECT: CHENNAI METRO RAIL PROJECT UNDER WORLD BANK ASSISTANCE

CLIENT: METRO DEPT. GOVT. OF CHENNAI

CONSULTANT: C O N S U L T I N G ENGINEERS GROUP LTD. (P) LTD. 11/13/3, Connaught Place, New Delhi-110021

WIDENING AND STRENGTHENING TO TWO LANE PLAN AND LONGITUDINAL SECTION JAGTIPUR TO CHANDBALI (11+720) TO 12+000

DATE:	NO.:	BY:	CHKD:
11/11/2011	001	...	...
REVISION:	NO.:	DATE:	BY:
...

PROJECT: UNDER WORLD BANK ASSISTANCE
GODHRA STATION ROAD PROJECT

CLIENT: WORLD BANK
GOVT. OF GUJARAT

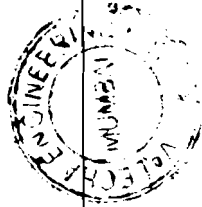
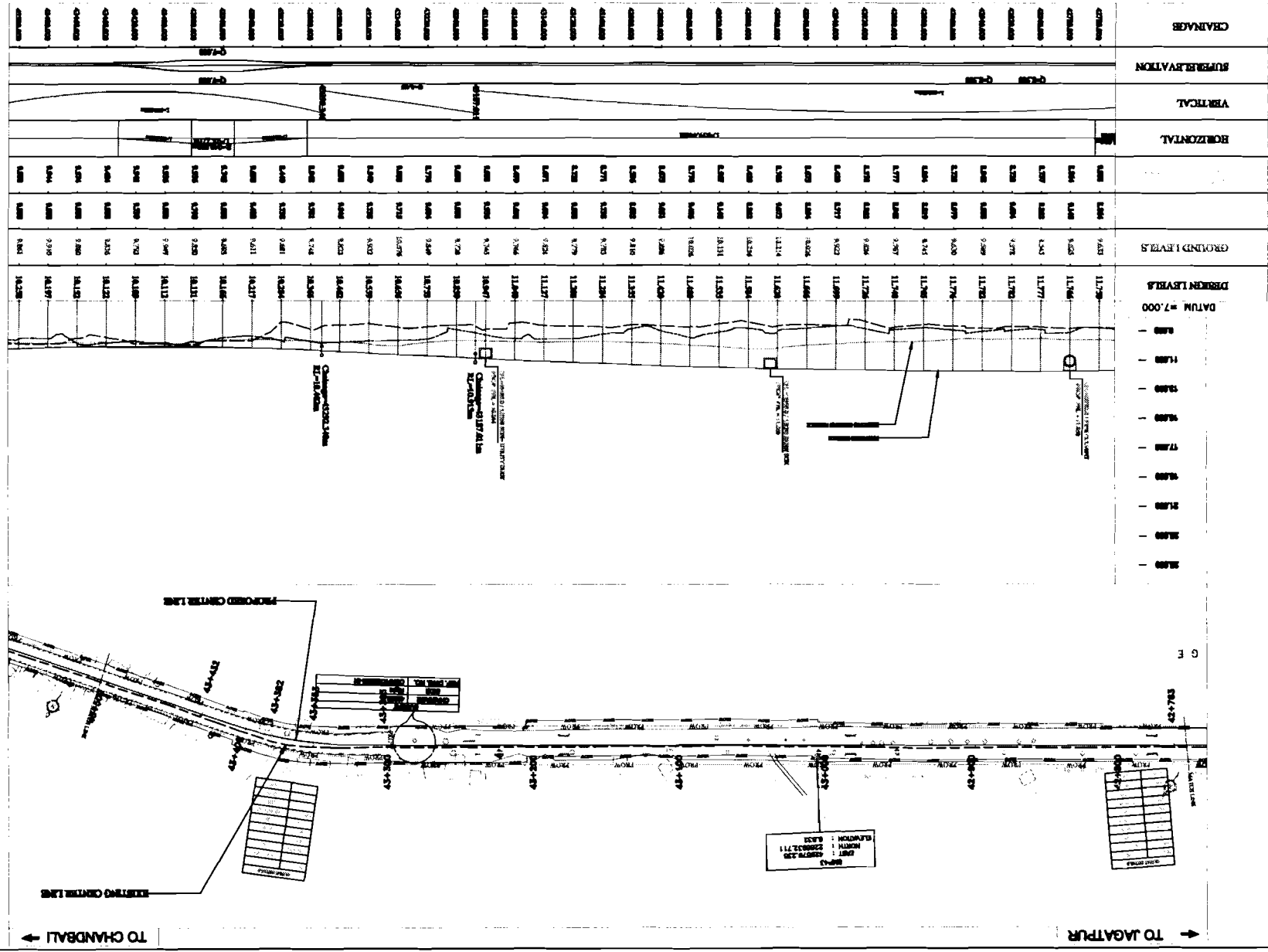
CONSULTANT: GEC
ENGINEERING GROUP LTD.
17/184, Connaught Place, New Delhi-110047
Tel: 471-141-1242/009, 2211192, 2200005
Fax: 2611141, e-mail: ecg@gecgroup.com

**WORKING AND STRENGTHENING TO TWO LANE
PLAN AND LONGITUDINAL SECTION
JAGATPUR TO DULHARIA ROAD/27/00 TO ICH/35/00**

DATE: 15/07/2008
SCALE: 1:1000
NO. OF SHEETS: 10
SHEET NO.: 01

REVISIONS:

NO.	DESCRIPTION	DATE
1	ISSUED FOR TENDER	15/07/2008
2	ISSUED FOR BIDDING	15/07/2008
3	ISSUED FOR CONTRACT	15/07/2008
4	ISSUED FOR EXECUTION	15/07/2008

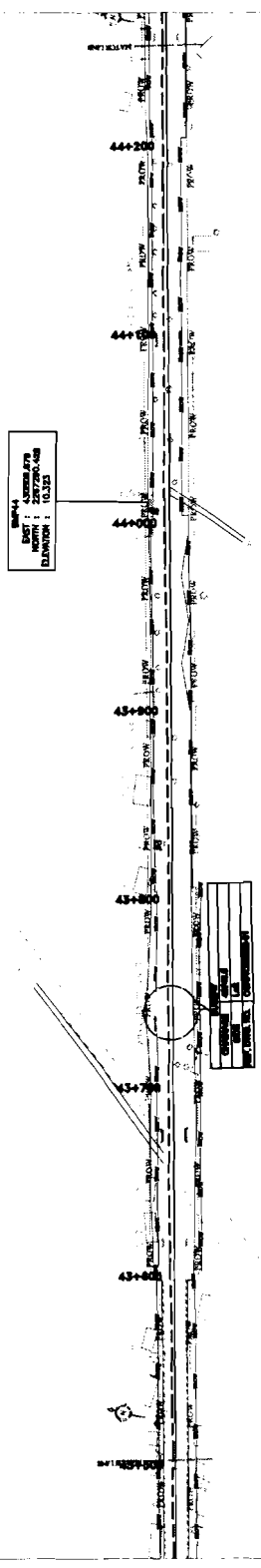


VALECHA ENGINEERING LTD.
Contractor

Chief Engineer
Wardha
Mr. the E. C. (Civil), 1000096
Rhubaneswar

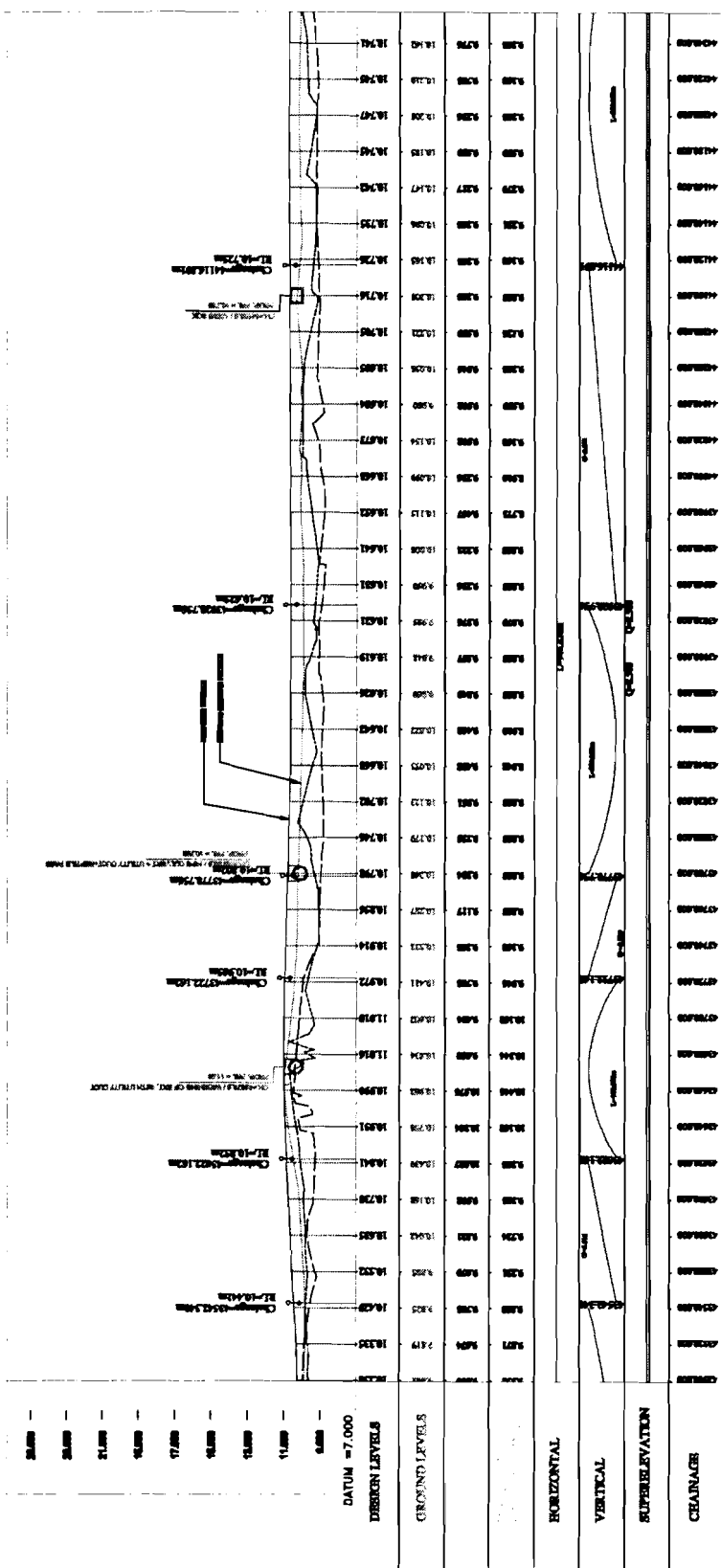
TO CHANDBALI →

← TO JAGATPUR



DATE: 15/08/2017
 BY: S. K. SINGH
 CHECKED: S. K. SINGH
 APPROVED: S. K. SINGH

NO.	DESCRIPTION
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2	...
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4	...
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6	...
7	...
8	...
9	...
10	...



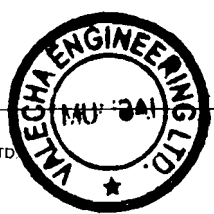
WIDENING AND STRENGTHENING TO TWO LANE PLAN AND LONGITUDINAL SECTION JAGATPUR TO DANUPUR NH-43800 TO NH-4280

CONSULTANT:
CE ENGINEERS GROUP LTD.
 17/2nd Cross-Balaji Nagar, Above-17
 1st Floor, 1st Stage, 1st Cross, 1st Stage
 Bangalore - 560002, Karnataka, India
 Tel: +91-81-252090, 252184, 252008
 Fax: +91-81-2521541, e-mail: info@cegroup.com

CLIENT:
WORKS DEPT., GOVT. OF ODISHA.

PROJECT:
 ODISHA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE

DATE: 15/08/2017
BY: S. K. SINGH
CHECKED: S. K. SINGH
APPROVED: S. K. SINGH

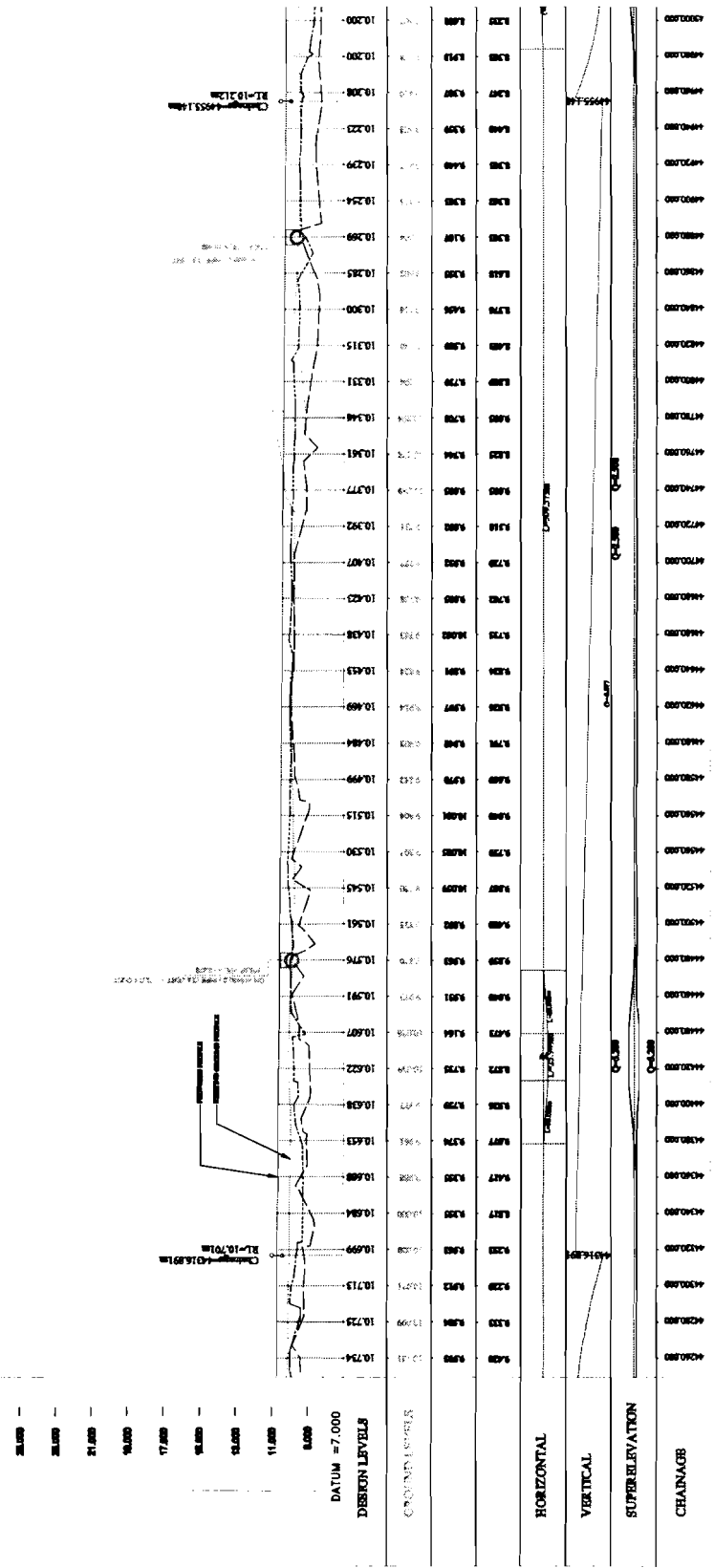
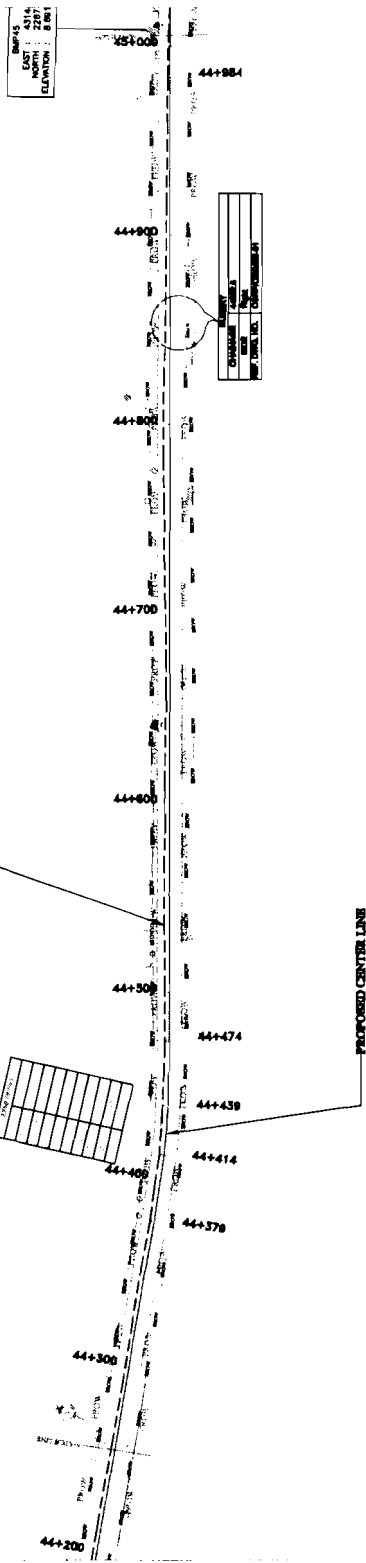


VALECHA ENGINEERING LTD
 Contractor

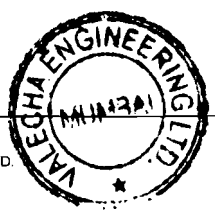
Chief Engineer
 World Bank Project
 to the Govt. of Odisha
 Rhubaneswar, Employer

TO CHANDBALI →

← TO JAGATPUR



WIDENING AND STRENGTHENING TO TWO LANE PLAN AND LONGITUDINAL SECTION JAGATPUR TO DULURIA Km.44280 TO Km.45000			
CONSULTANT:- VALECHA ENGINEERING LTD. 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 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	CLIENT:- WORKS DEPT. GOVT. OF ODISHA.	PROJECT:- ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE	DATE: 10/10/10 SCALE: 1:1000 PROJECT NO.: 10/10/10

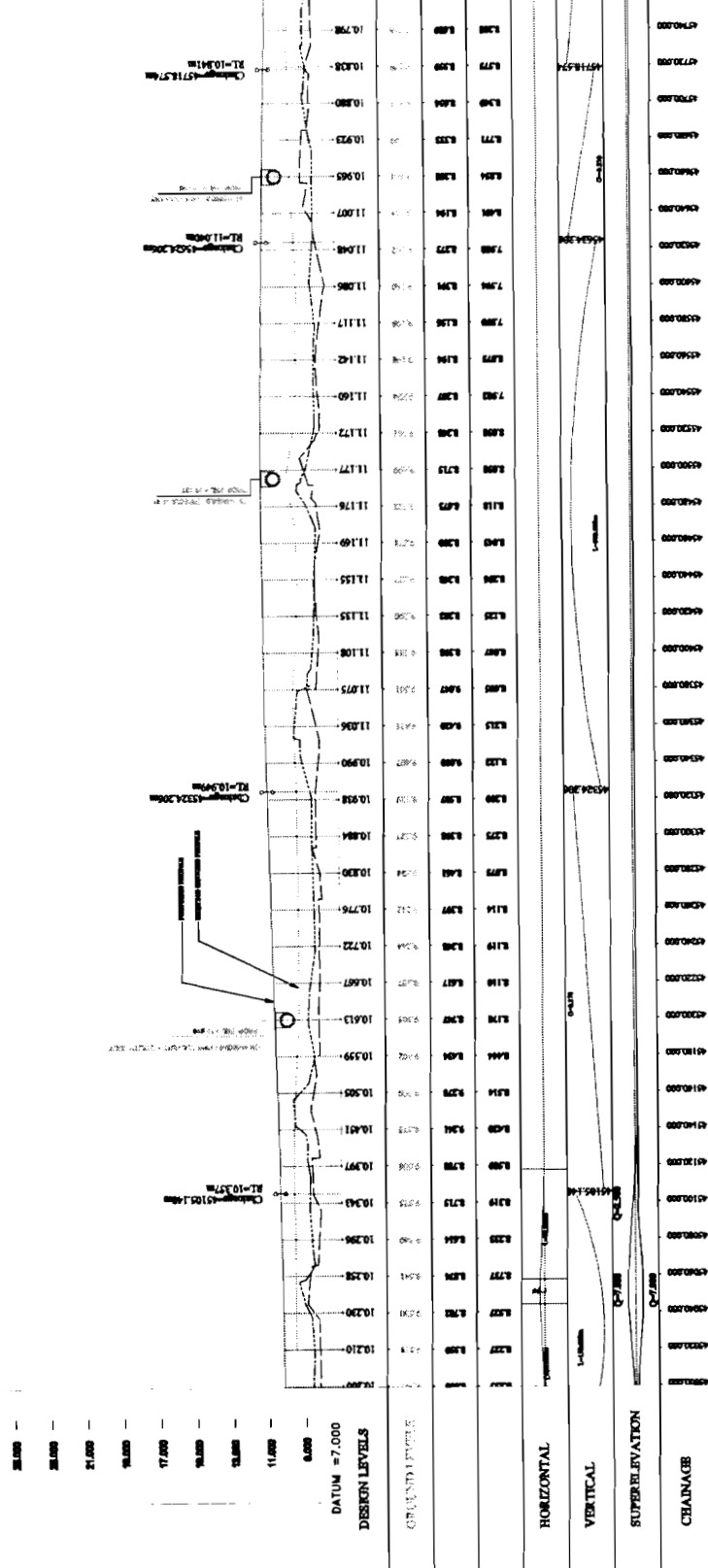
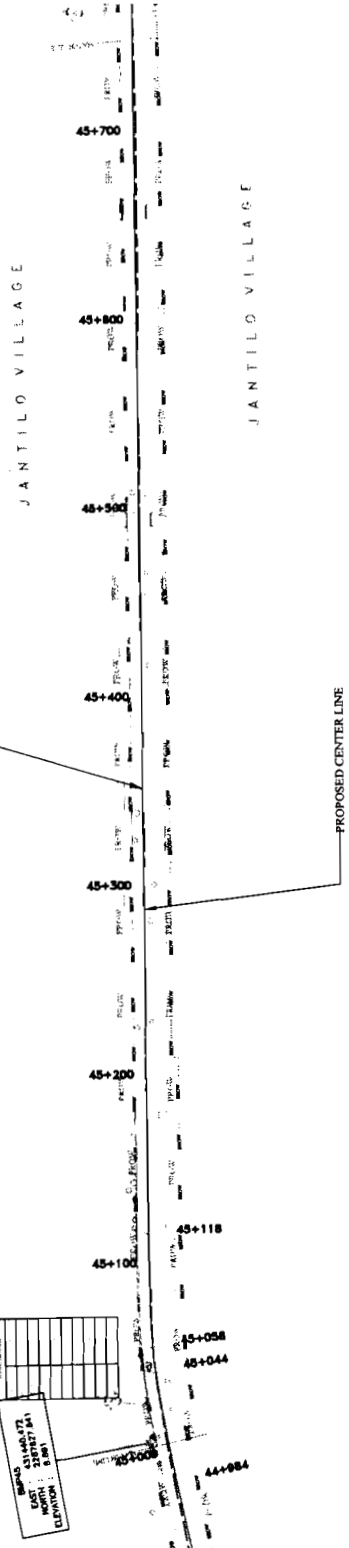


VALECHA ENGINEERING LTD.
Contractor

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

TO CHANDBALI →

← TO JAGATPUR

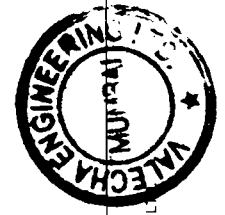


CONSULTANT:- CONSULTING ENGINEERS GROUP LTD. 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 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, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 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.		CLIENT:- WORKS DEPT. GOVT. OF ODISHA	PROJECT:- ODISHA STATE ROAD PROJECT JAGATPUR TO DULAIYA	WIDENING AND STRENGTHENING TO TWO LANE PLAN AND LONGITUDINAL SECTION JAGATPUR TO DULAIYA Km.45700 TO Km.45780
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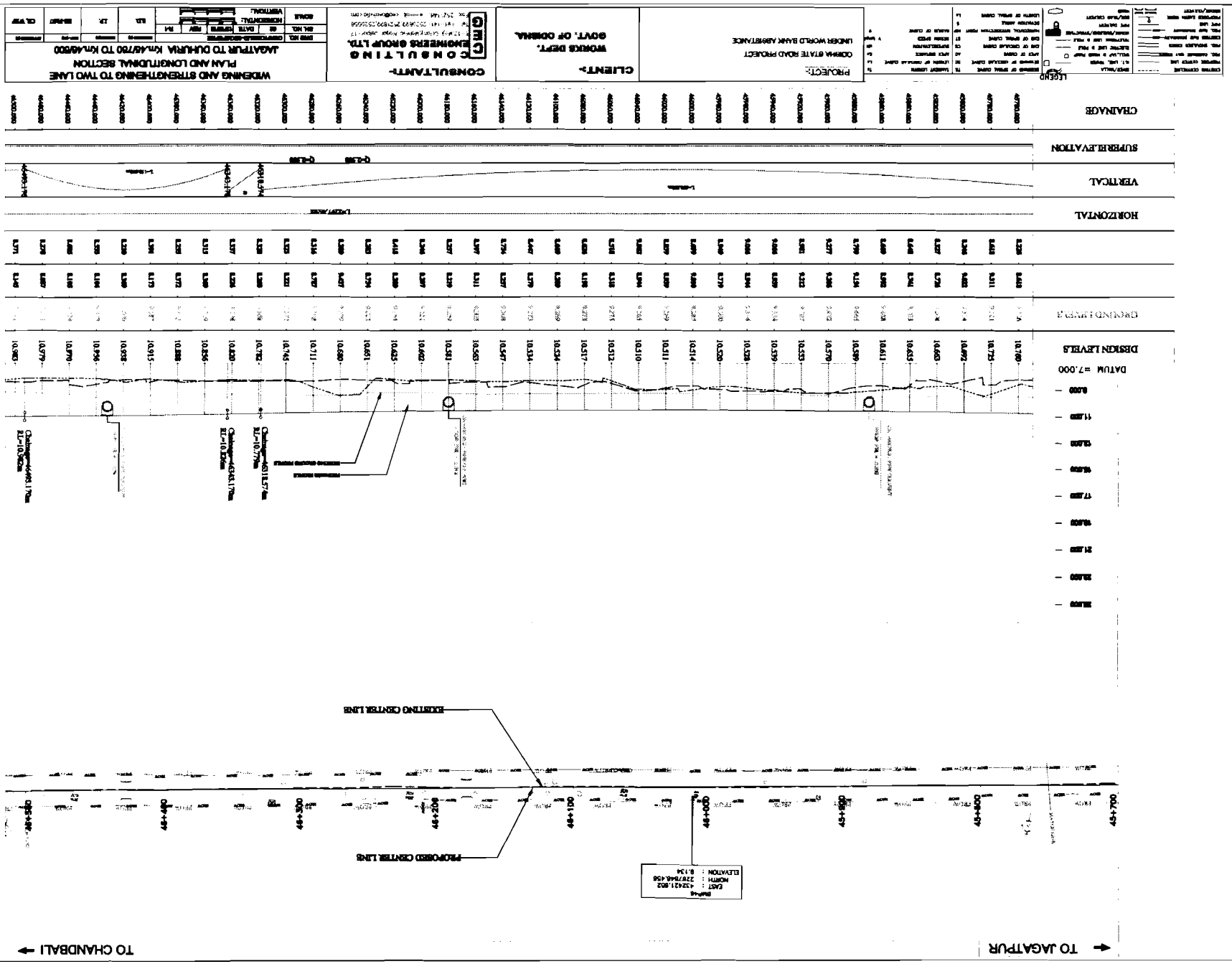


Chief Engineer,
 World Bank Project,
 the E.I.C. (Civil), Odisha
 Bhubaneswar.

Chief Engineer,
World Bank Projects Odisha
P.O. the E. C. (Civil), Odisha
Rhubaneswar.



VALECHA ENGINEERING LIMITED
Contractor



TO CHANDBALI →

→ TO JAGTAPUR

BM-4
EAST : 12421.02
NORTH : 27864.45
ELEVATION : 8.734

CLIENTS: GOVT. OF ODISHA

PROJECT: ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE

CONSULTANT: G.M.C. ENGINEERS GROUP LTD.

WORKING AND STRENGTHENING TO TWO LANE JAGTAPUR TO DUKHURA KM/4780 TO KM/4800 PLAN AND LONGITUDINAL SECTION

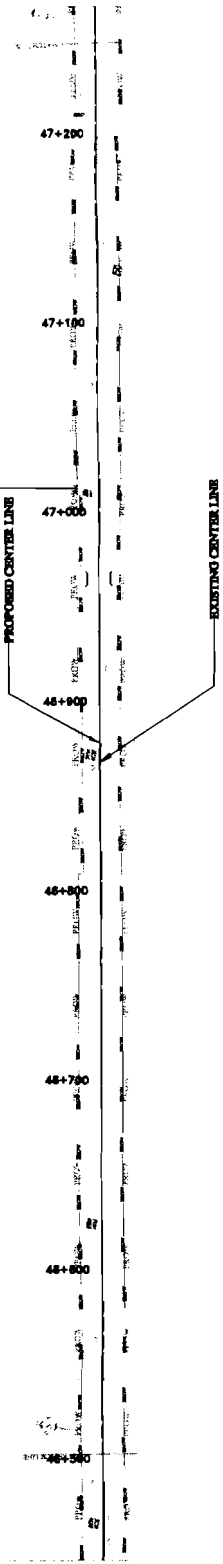
LEGEND: (Includes symbols for center line, ground level, design level, etc.)

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

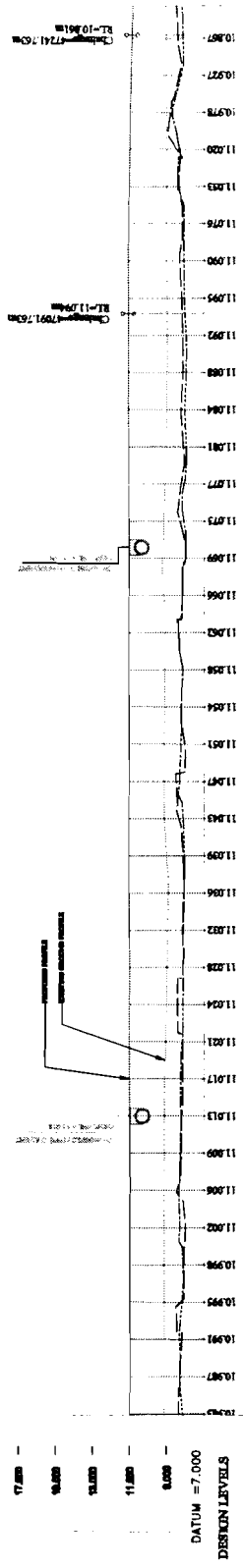
TO CHANDBALI →

← TO JAGATPUR

BENCH MARK
 EASTING : 230802.978
 NORTH : 230802.978
 ELEVATION : 8.341



28.000
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 100.000



STATION	GROUND LEVEL (M)	PROPOSED LEVEL (M)	CHANGING
46+800	11.000	11.000	0.000
46+810	11.000	11.000	0.000
46+820	11.000	11.000	0.000
46+830	11.000	11.000	0.000
46+840	11.000	11.000	0.000
46+850	11.000	11.000	0.000
46+860	11.000	11.000	0.000
46+870	11.000	11.000	0.000
46+880	11.000	11.000	0.000
46+890	11.000	11.000	0.000
46+900	11.000	11.000	0.000
46+910	11.000	11.000	0.000
46+920	11.000	11.000	0.000
46+930	11.000	11.000	0.000
46+940	11.000	11.000	0.000
46+950	11.000	11.000	0.000
46+960	11.000	11.000	0.000
46+970	11.000	11.000	0.000
46+980	11.000	11.000	0.000
46+990	11.000	11.000	0.000
47+000	11.000	11.000	0.000
47+010	11.000	11.000	0.000
47+020	11.000	11.000	0.000
47+030	11.000	11.000	0.000
47+040	11.000	11.000	0.000
47+050	11.000	11.000	0.000
47+060	11.000	11.000	0.000
47+070	11.000	11.000	0.000
47+080	11.000	11.000	0.000
47+090	11.000	11.000	0.000
47+100	11.000	11.000	0.000
47+110	11.000	11.000	0.000
47+120	11.000	11.000	0.000
47+130	11.000	11.000	0.000
47+140	11.000	11.000	0.000
47+150	11.000	11.000	0.000
47+160	11.000	11.000	0.000
47+170	11.000	11.000	0.000
47+180	11.000	11.000	0.000
47+190	11.000	11.000	0.000
47+200	11.000	11.000	0.000

STATION	GROUND LEVEL (M)	PROPOSED LEVEL (M)	CHANGING
47+210	11.000	11.000	0.000
47+220	11.000	11.000	0.000
47+230	11.000	11.000	0.000
47+240	11.000	11.000	0.000
47+250	11.000	11.000	0.000
47+260	11.000	11.000	0.000
47+270	11.000	11.000	0.000
47+280	11.000	11.000	0.000
47+290	11.000	11.000	0.000
47+300	11.000	11.000	0.000
47+310	11.000	11.000	0.000
47+320	11.000	11.000	0.000
47+330	11.000	11.000	0.000
47+340	11.000	11.000	0.000
47+350	11.000	11.000	0.000
47+360	11.000	11.000	0.000
47+370	11.000	11.000	0.000
47+380	11.000	11.000	0.000
47+390	11.000	11.000	0.000
47+400	11.000	11.000	0.000
47+410	11.000	11.000	0.000
47+420	11.000	11.000	0.000
47+430	11.000	11.000	0.000
47+440	11.000	11.000	0.000
47+450	11.000	11.000	0.000
47+460	11.000	11.000	0.000
47+470	11.000	11.000	0.000
47+480	11.000	11.000	0.000
47+490	11.000	11.000	0.000
47+500	11.000	11.000	0.000

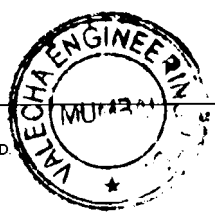
WIDENING AND STRENGTHENING TO TWO LANE
 PLAN AND LONGITUDINAL SECTION
 JAGATPUR TO DUAHURA KM-46800 TO KM-47200

CONSULTANT:
CEG
 CIVIL ENGINEERING GROUP LTD.
 PLOT NO. 10, INDUSTRIAL AREA, PHASE II, VIKRAM SARABHAI
 AIRPORT ROAD, CHANDIBAZAR, KOLKATA-700016, INDIA
 TEL: 91-33-25521111 FAX: 91-33-25521111
 WWW.CEGINDIA.COM

CLIENT:
 WORKS DEPT.
 GOVT. OF ODISHA

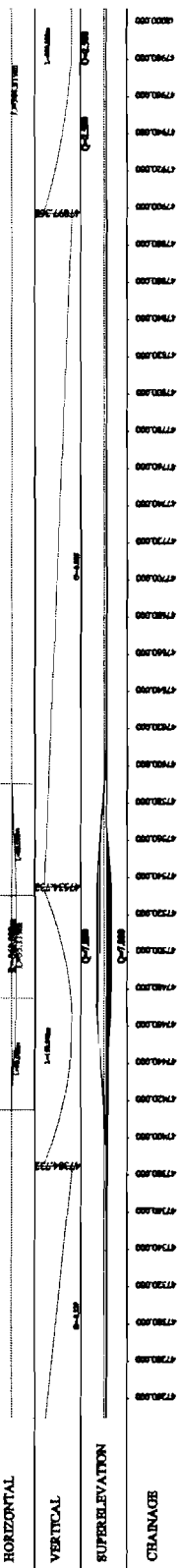
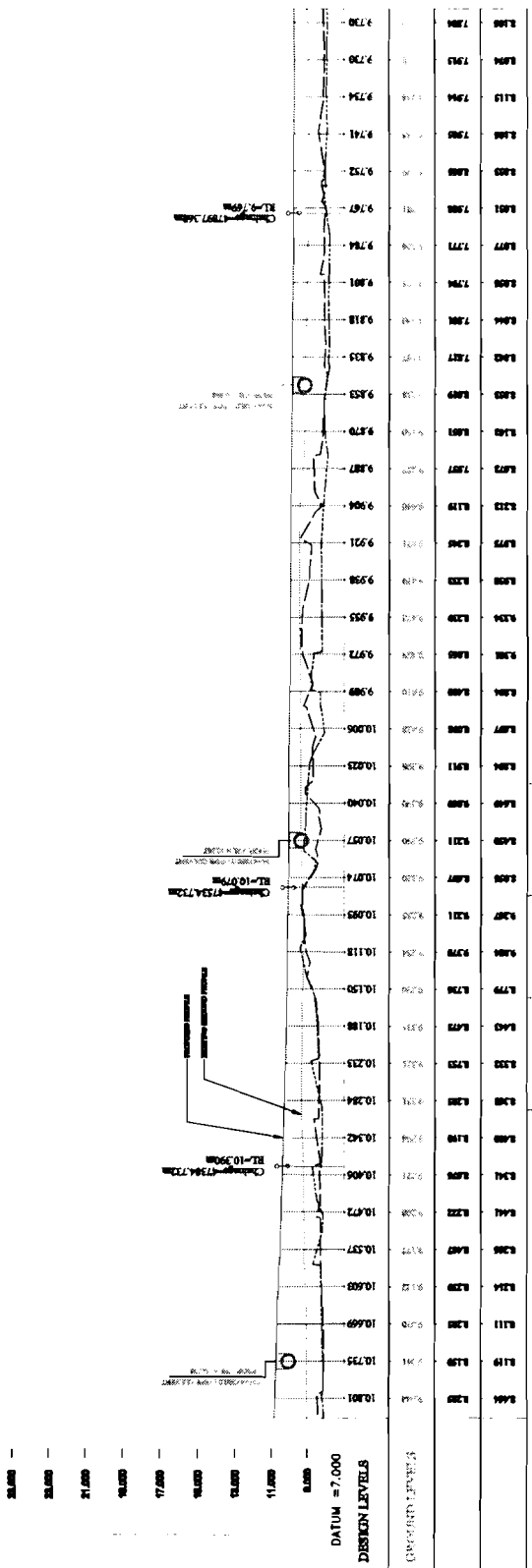
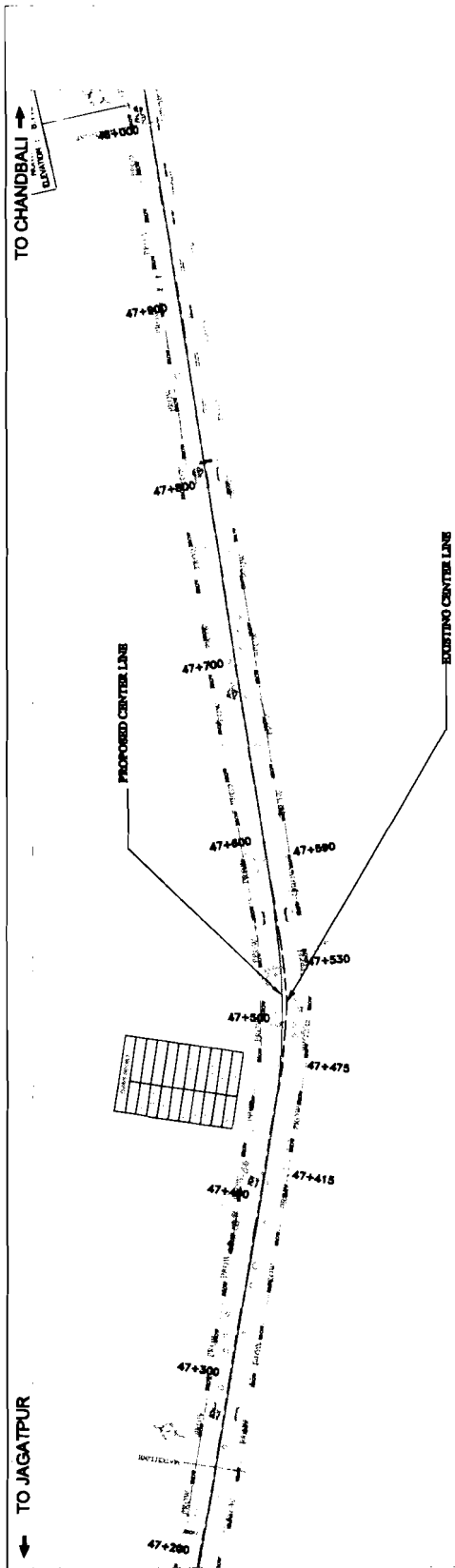
PROJECT:
 ODISHA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE

LEGEND
 1. LINED AREA: 1. LINED AREA
 2. UNLINED AREA: 2. UNLINED AREA
 3. EXISTING ROAD: 3. EXISTING ROAD
 4. PROPOSED ROAD: 4. PROPOSED ROAD
 5. BENCH MARK: 5. BENCH MARK
 6. WATER COURSE: 6. WATER COURSE
 7. FENCE: 7. FENCE
 8. TREE: 8. TREE
 9. POLE: 9. POLE
 10. SIGN: 10. SIGN
 11. LIGHT: 11. LIGHT
 12. TELEPHONE: 12. TELEPHONE
 13. POWER: 13. POWER
 14. TELEGRAPH: 14. TELEGRAPH
 15. TELEVISION: 15. TELEVISION
 16. RADIO: 16. RADIO
 17. TELEPHONE: 17. TELEPHONE
 18. POWER: 18. POWER
 19. TELEGRAPH: 19. TELEGRAPH
 20. TELEVISION: 20. TELEVISION
 21. RADIO: 21. RADIO



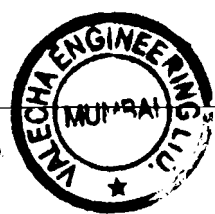
VALECHA ENGINEERING LTD.
 Contractor

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



Station	Proposed Elevation	Ground Elevation
47+280	10.801	9.64
47+290	10.795	9.68
47+300	10.784	9.71
47+310	10.769	9.73
47+320	10.752	9.74
47+330	10.734	9.74
47+340	10.714	9.73
47+350	10.691	9.71
47+360	10.664	9.68
47+370	10.643	9.64
47+380	10.627	9.59
47+390	10.614	9.53
47+400	10.604	9.47
47+410	10.598	9.40
47+420	10.594	9.33
47+430	10.592	9.25
47+440	10.591	9.17
47+450	10.591	9.08
47+460	10.592	9.00
47+470	10.594	8.92
47+480	10.597	8.84
47+490	10.601	8.76
47+500	10.604	8.68
47+510	10.607	8.60
47+520	10.610	8.52
47+530	10.612	8.44
47+540	10.613	8.36
47+550	10.614	8.28
47+560	10.614	8.20
47+570	10.614	8.12
47+580	10.613	8.04
47+590	10.612	7.96
47+600	10.610	7.88
47+610	10.608	7.80
47+620	10.605	7.72
47+630	10.602	7.64
47+640	10.599	7.56
47+650	10.595	7.48
47+660	10.591	7.40
47+670	10.587	7.32
47+680	10.582	7.24
47+690	10.577	7.16
47+700	10.572	7.08
47+710	10.567	7.00
47+720	10.562	6.92
47+730	10.557	6.84
47+740	10.552	6.76
47+750	10.547	6.68
47+760	10.542	6.60
47+770	10.537	6.52
47+780	10.532	6.44
47+790	10.527	6.36
47+800	10.522	6.28

PROJECT: ODISHA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE
 CONSULTANT: CE ENGINEERS GROUP LTD.
 CLIENT: WORKS DEPT. GOVT. OF ODISHA.

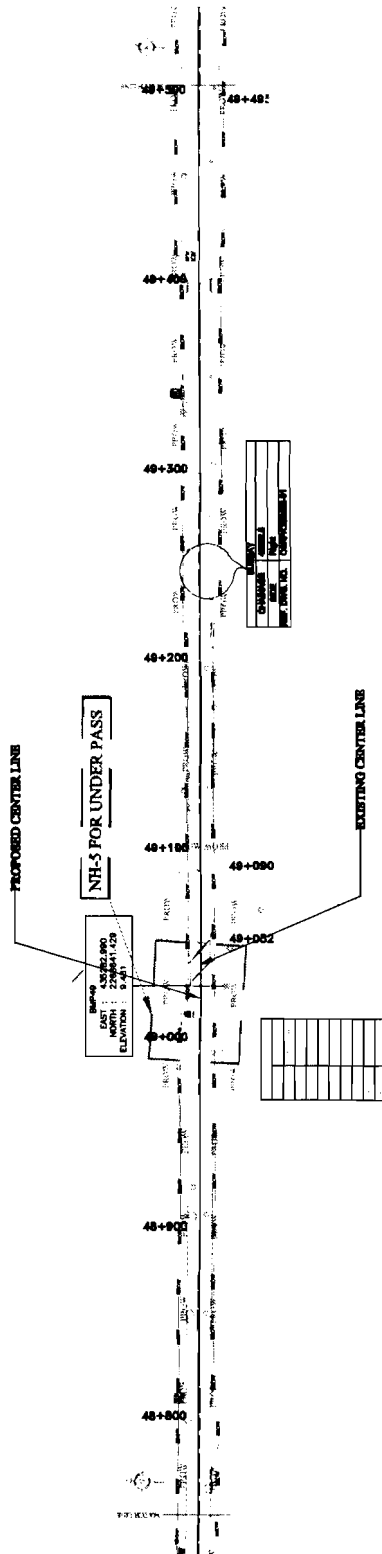


VALECHA ENGINEERING LTD. Contractor

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

TO CHANDBALI →

← TO JAGATPUR



Station	Ground Level	Design Level	Vertical Curve Data
48+00	9.87	9.87	
48+05	9.96	9.96	
48+10	9.77	9.77	
48+15	9.83	9.83	
48+20	9.92	9.92	
48+25	9.94	9.94	
48+30	9.94	9.94	
48+35	9.94	9.94	
48+40	9.94	9.94	
48+45	9.94	9.94	
48+50	9.94	9.94	
48+55	9.94	9.94	
48+60	9.94	9.94	
48+65	9.94	9.94	
48+70	9.94	9.94	
48+75	9.94	9.94	
48+80	9.94	9.94	
48+85	9.94	9.94	
48+90	9.94	9.94	
48+95	9.94	9.94	
49+00	9.94	9.94	

Station	Horizontal	Vertical	Superelevation
48+00	0.00	0.00	0.00
48+05	0.00	0.00	0.00
48+10	0.00	0.00	0.00
48+15	0.00	0.00	0.00
48+20	0.00	0.00	0.00
48+25	0.00	0.00	0.00
48+30	0.00	0.00	0.00
48+35	0.00	0.00	0.00
48+40	0.00	0.00	0.00
48+45	0.00	0.00	0.00
48+50	0.00	0.00	0.00
48+55	0.00	0.00	0.00
48+60	0.00	0.00	0.00
48+65	0.00	0.00	0.00
48+70	0.00	0.00	0.00
48+75	0.00	0.00	0.00
48+80	0.00	0.00	0.00
48+85	0.00	0.00	0.00
48+90	0.00	0.00	0.00
48+95	0.00	0.00	0.00
49+00	0.00	0.00	0.00

WIDENING AND STRENGTHENING TO TWO LANE PLAN AND LONGITUDINAL SECTION JAGATPUR TOURISM K.M. 48750 TO K.M. 48800

CONSULTANT: CON S U L T I N G ENGINEERS GROUP LTD.

CLIENT: WORKS DEPT. GOVT. OF ODISHA.

PROJECT: ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE

DATE: 15/08/2011

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

DESIGNER: [Signature]

CHECKER: [Signature]

APPROVED: [Signature]



SCHEDULE OF TRAFFIC SIGNS (JAGATPUR - DUHURIA)

SIGN POST ID	DESCRIPTION OF SIGN BOARD	CHAINAGE	LEFT LANE	RIGHT LANE	CR (L)	CR (R)	SIGN POST ID	DESCRIPTION OF SIGN BOARD	CHAINAGE	LEFT LANE	RIGHT LANE	CR (L)	CR (R)
182	STOP					Y			22853			Y	
510					Y				22932			Y	
1183					Y				24120			Y	Y
1366					Y				24430			Y	
1806						Y			24873			Y	Y
1818					Y				25673			Y	Y
2052						Y			25683			Y	
2118					Y				26043			Y	
2118						Y			26309			Y	Y
2184					Y				26694			Y	Y
2739						Y			26815			Y	
2854					Y				27987			Y	
2965					Y				28093			Y	
3326					Y				28162			Y	
3846						Y			28164			Y	Y
3990					Y				28274			Y	Y
4205						Y			28955			Y	Y
4452					Y				29673			Y	Y
4737					Y				29698			Y	Y
5160					Y				30656			Y	Y
5262					Y				30845			Y	Y
5686					Y				31692			Y	Y
5875					Y				32585			Y	Y
6070						Y			32700			Y	Y
6116					Y				32700			Y	Y
6205						Y			32822			Y	Y
6205					Y				33133			Y	Y
6318					Y				33665			Y	Y
6554					Y				33682			Y	Y
6557						Y			34008			Y	Y
6804					Y				35335			Y	Y
7640					Y				35718			Y	Y
7871						Y			35770			Y	Y
9024						Y			35868			Y	Y
9036					Y				36257			Y	Y
9439						Y			36270			Y	Y
9486					Y				36730			Y	Y
10440					Y				37172			Y	Y
10858					Y				37184			Y	Y
10878					Y				37923			Y	Y
13113					Y				37930			Y	Y
13530					Y				38030			Y	Y
13896						Y			38554			Y	Y
13904					Y				38723			Y	Y
15646					Y				38930			Y	Y
16650					Y				38945			Y	Y
16891						Y			39380			Y	Y
16895					Y				40782			Y	Y
18658					Y				41446			Y	Y
18817						Y			41504			Y	Y
19556					Y				42094			Y	Y
19642						Y			42183			Y	Y
19771					Y				42542			Y	Y
20028						Y			43041			Y	Y
20062					Y				43380			Y	Y
20436					Y				43660			Y	Y
21332						Y			44019			Y	Y
21350					Y				44485			Y	Y
21891					Y				44640			Y	Y
						Y			44645			Y	Y
						Y			44803			Y	Y
						Y			44883			Y	Y
						Y			45485			Y	Y
						Y			45900			Y	Y
						Y			46251			Y	Y
						Y			47190			Y	Y
						Y			47536			Y	Y
						Y			47556			Y	Y
						Y			47725			Y	Y
						Y			48405			Y	Y
						Y			48465			Y	Y

NOTES:
 1. ALL SIGNS SHALL BE IN ACCORDANCE WITH THE INDIAN STANDARDS.
 2. ALL SIGNS SHALL BE IN ACCORDANCE WITH THE INDIAN STANDARDS.
 3. ALL SIGNS SHALL BE IN ACCORDANCE WITH THE INDIAN STANDARDS.
 4. ALL SIGNS SHALL BE IN ACCORDANCE WITH THE INDIAN STANDARDS.
 5. ALL SIGNS SHALL BE IN ACCORDANCE WITH THE INDIAN STANDARDS.

VALECHA ENGINEERING LTD.
 Contractor



Volume-IV/Page 78 of 160

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

PROJECT :-
 SHASHA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE

CLIENT :-
 WORKS DEPARTMENT
 GOVT. OF ODISHA

CEG 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

SCHEDULE OF SIGN POST (1 of 09) (JAGATPUR TO DUHURIA)										
DRG NO	OSRP:CEG/JD-49KM/SC11.01					DESIGNED BY	DRAWN BY	REV. NO	APPROVED	
SHEET NO	145	DATE	12/12/12	RFV	R-1	CEG	CEG	PREPARED BY	CE.WBP	EE(PMU)
SCALE	NTS									



SCHEDULE OF TRAFFIC SIGNS (JAGATPUR - DUHURIA)

SIGN POST ID	DESCRIPTION OF SIGN BOARD	CHAINAGE	LEFT LANE	RIGHT LANE	CR (L)	CR (R)		
SP - 2A	RESTRICTION ENDS	1789		Y				
		2348	Y					
		2425			Y			
		2557	Y					
		2959			Y			
		3056	Y					
		5786			Y			
		6752	Y					
		6930			Y			
		7253	Y					
		7396			Y			
		7539	Y					
		10021			Y			
		10488	Y					
		16567			Y			
		16716	Y					
		17296			Y			
		18722	Y					
		19858			Y			
		20312	Y					
		22796			Y			
		23179	Y					
		24095			Y			
		24197	Y					
28120			Y					
28208	Y							
36706			Y					
36984	Y							
37994			Y					
38070	Y							
43323			Y					
44469	Y							
48375			Y					
48445	Y							
SP - 4C	SPEED LIMIT - 50	1789	Y					
		2348			Y			
		6930	Y					
		7253			Y			
		62992	Y					
		63104			Y			
		SP - 4D	SPEED LIMIT - 65	2425	Y			
				2557			Y	
				2959	Y			
				3056			Y	
5786	Y							
6752					Y			
7396	Y							
7539					Y			
10021	Y							
10488					Y			
16567	Y							
16716			Y					
17296	Y							
18722			Y					
19858	Y							
20312			Y					
22796	Y							
23179			Y					
24095	Y							
24197			Y					

1. ALL THE SIGNS TO BE MADE IN ACCORDANCE WITH THE INDIAN STANDARDS.
2. REFLECTIVE LANE.
3. REFLECTANT ROAD LETTER.

1. ALL SIGNS TO BE MADE IN ACCORDANCE WITH THE INDIAN STANDARDS.
2. REFLECTIVE LANE.
3. REFLECTANT ROAD LETTER.
4. SIGN POST SHALL BE INSTALLED AT AN APPROPRIATE DISTANCE FROM THE BEGINNING OF CARRIAGE WAY.

Chief Engineer
Roads & Bridges
Odisha
for the E.C.C. CIVIL DIVISION
Rhubaneswar

PROJECT :-
KALINGA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

CLIENT :-
WORKS DEPARTMENT
GOVT. OF ODISHA

CEG 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

SCHEDULE OF SIGN POST (2 of 09)									
(JAGATPUR TO DUHURIA)									
DRG NO.	OSRP/CEG/JD-49KM/SCH/02				DESIGNED BY	DRAWN BY	REV. BY	APPROVED	
SIL NO.	146	DATE	12/12/12	REV	R-1	CEG	CEG	PREPARED BY	CE.WBP
SCALE	NTS						EE(PMU)		

SCHEDULE OF TRAFFIC SIGNS (JAGATPUR - DUHURIA)

SIGN POST ID	DESCRIPTION OF SIGN BOARD	CHAINAGE	LEFT LANE	RIGHT LANE	CR (L)	CR (R)	SIGN POST ID	DESCRIPTION OF SIGN BOARD	CHAINAGE	LEFT LANE	RIGHT LANE	CR (L)	CR (R)
SP - 4D	SPEED LIMIT - 65	28120	Y				SP - 7	COMPULSORY SOUND HORN	6524	Y			
		28208	Y						6587		Y		
		36706	Y						6834	Y			
		36984	Y						7610		Y		
		37994	Y						7901		Y		
		38070	Y						9054		Y		
		43323	Y						9006		Y		
		44469	Y						9469		Y		
		48375	Y						9456		Y		
		48445	Y						10410		Y		
SP - 6	SCHOOL ZONE	4066	Y						10888		Y		
		4239	Y						10848		Y		
		4246	Y						13063		Y		
		4368	Y						13500		Y		
		4459	Y						13926		Y		
		4600	Y						13874		Y		
		5292	Y						15616		Y		
		5530	Y						16620		Y		
		5608	Y						16921		Y		
		5822	Y						16865		Y		
		10183	Y						18628		Y		
		10412	Y						18847		Y		
		18672	Y						19526		Y		
		18874	Y						19672		Y		
		19467	Y						19741		Y		
		19689	Y						20058		Y		
		36856	Y						20032		Y		
SP - 7	COMPULSORY SOUND HORN	37090	Y						20406		Y		
		212	Y						21342		Y		
		480	Y						21320		Y		
		1153	Y						21861		Y		
		1336	Y						22823		Y		
		1836	Y						22902		Y		
		1788	Y						24150		Y		
		2082	Y						24400		Y		
		2088	Y						24903		Y		
		2148	Y						25703		Y		
		2154	Y						25653		Y		
		2709	Y						26013		Y		
		2824	Y						26339		Y		
		2935	Y						26724		Y		
		3296	Y						26785		Y		
		3876	Y						27957		Y		
		3960	Y						28063		Y		
		4235	Y						28132		Y		
		4422	Y						28194		Y		
		4707	Y						28304		Y		
		5130	Y						28985		Y		
		5232	Y						29643		Y		
		5656	Y						29728		Y		
		5845	Y						30686		Y		
		6100	Y						30875		Y		
		6086	Y						31722		Y		
		6175	Y						32555		Y		
		6235	Y						32670		Y		
		6288	Y						32730		Y		
									32792		Y		
									33163		Y		
									33635		Y		
									33712		Y		

SCALE: _____
 DATE: _____
 DRAWN BY: _____
 CHECKED BY: _____
 APPROVED BY: _____

SCHEDULE OF SIGN POST (03 of 09)
 (JAGATPUR TO DUHURIA)

DRG. NO.	OSRP/CEG/IC-106/KM/SCH/03	DATE	12/12/12	R/F	R-1	CEG	CEG	PREPARED BY	EE, PMU	APPROVED	CE, WRP
S/N. NO.	148	NTS									
SCALE											

CONSULTING ENGINEERS GROUP LTD.
 E-12, Meji Colony, Malviya Nagar Jaipur-17
 Tel: +91-141-2520899, 2521899, 2520556
 Fax: 2521348, e-mail: ceg@ceindia.com

CLIENT :-
WORKS DEPARTMENT
GOVT. OF ODISHA

PROJECT :-
 ODISHA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE

VALECHA ENGINEERING LTD.
 Contractor



Chief Engineer,
 Works Department,
 Govt. of Odisha,
 Bhubaneswar.

SCHEDULE OF TRAFFIC SIGNS (JAGATPUR - DUHURIA)

SIGN POST ID	DESCRIPTION OF SIGN BOARD	CHAINAGE	LEFT LANE	RIGHT LANE	CR (L)	CR (R)
SP - 7	COMPULSORY SOUND HORN	33978	Y			
		35365		Y		
		35688	Y			
		35740		Y		
		35898		Y		
		36287		Y		
		36240	Y			
		36700	Y			
		37142	Y			
		37214		Y		
		37893	Y			
		37960	Y			
		38000	Y			
		38524	Y			
		38693	Y			
		38900	Y			
		38975	Y			
		39410	Y			
		40752	Y			
		SP - 8	CROSS ROAD	41476		Y
41534	Y					
42064				Y		
42213				Y		
42572				Y		
43011	Y					
43350	Y					
43630	Y					
44049	Y					
44515				Y		
44670	Y					
44615	Y					
44773	Y					
44913	Y					
45455	Y					
45930	Y					
46221	Y					
47220	Y					
47566	Y					
47526	Y					
47755	Y					
48435	Y					
48435	Y					
SP - 9A	RIGHT SIDE ROAD - T	2088	Y			
		2148	Y			
		6175	Y			
		6235	Y			
		32670	Y			
		32730	Y			
		152	Y			
		1776	Y			
		2022	Y			
		2884	Y			
		3816	Y			
		4020	Y			
4175	Y					
4482	Y					
4767	Y					
5292	Y					
5905	Y					

SCALE: 1:1000 (FOR ROAD PLAN)
SCALE: 1:500 (FOR SIGN BOARD PLAN)
SCALE: 1:100 (FOR SIGN POST PLAN)
SCALE: 1:100 (FOR SIGN POST PLAN)
SCALE: 1:100 (FOR SIGN POST PLAN)

SP - 9A	DESCRIPTION OF SIGN BOARD	CHAINAGE	LEFT LANE	RIGHT LANE	CR (L)	CR (R)
SP - 9A	RIGHT SIDE ROAD - T	6527	Y			
		6584		Y		
		8994	Y			
		9066		Y		
		9409		Y		
		9516		Y		
		10470	Y			
		19586	Y			
		19998	Y			
		20466	Y			
		21282	Y			
		22883	Y			
		22962	Y			
		26664	Y			
		30626	Y			
		30815	Y			
		31662	Y			
		37900	Y			
		38060	Y			
		41416	Y			
42124	Y					
44610	Y					
44675	Y					
44853	Y					
47506	Y					
47586	Y					
48495	Y					
SP - 9B	LEFT SIDE ROAD - T	212	Y			
		1836	Y			
		2082	Y			
		2824	Y			
		3876	Y			
		3960	Y			
		4235	Y			
		4422	Y			
		4707	Y			
		5232	Y			
		5845	Y			
		6524	Y			
		6587	Y			
		9006	Y			
		9054	Y			
		9456	Y			
		9469	Y			
		10410	Y			
		19526	Y			
		20058	Y			
20406	Y					
21342	Y					
22823	Y					
22902	Y					
26724	Y					
30686	Y					
30875	Y					
31722	Y					
37960	Y					
38000	Y					
41476	Y					
42064	Y					
44615	Y					
44670	Y					
44913	Y					
47526	Y					
47566	Y					
48435	Y					

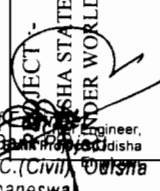
DRG NO.	OSRP/CEG/JC-106KM/SC/104	DESIGNED BY	CEG	CEG	PREPARED BY	EE, PMU	APPROVED	CE, WBP
SH NO.	149	DATE	12/12/12	REV	R-1			
SCALE		NTS						

SCHEDULE OF SIGN POST (04 of 09)
(JAGATPUR TO DUHURIA)

CONSULTING ENGINEERS GROUP LTD.
E-12, Moj Colony, Malviya Nagar, Jaipur-17
Tel: +91-141-2520899, 2521899, 2520556
Fax: 2521348, e-mail: ceg@cegroupindia.com

CLIENT :-
**WORKS DEPARTMENT
GOVT. OF ODISHA**

PROJECT :-
**ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE**



SCHEDULE OF TRAFFIC SIGNS (JAGATPUR - DUHURIA)

SIGN POST ID	DESCRIPTION OF SIGN BOARD	CHAINAGE	LEFT LANE	RIGHT LANE	CR (L)	CR (R)
SP - 10A	RIGHT HAND CURVE	2595	Y			
		3106		Y		
		5099	Y			
		5751	Y			
		9986		Y		
		10323		Y		
		10914		Y		
		12624		Y		
		17246	Y			
		19985		Y		
		21998		Y		
		22515		Y		
		24045	Y			
		24989		Y		
		28458		Y		
		29807		Y		
		30573		Y		
		32791		Y		
		33673		Y		
		34619		Y		
		35713	Y			
		41603		Y		
		42376		Y		
		43273	Y			
		44504		Y		
		44954	Y			
		47620		Y		
		48305		Y		
SP - 10B	LEFT HAND CURVE	2831	Y			
		2909		Y		
		5360		Y		
		5945		Y		
		10197		Y		
		10357	Y			
		10666		Y		
		12299		Y		
		17428		Y		
		19823		Y		
		21812		Y		
		22267		Y		
		24247		Y		
		24780	Y			
		28263		Y		
		29637		Y		
		30765		Y		
		32604		Y		
		33922		Y		
		34416		Y		
		35897		Y		
		41404	Y			
		42201		Y		
		43462		Y		
		44349		Y		
		45148		Y		
		47385	Y			
		48515		Y		
		22746	Y			
SP - 10E	RIGHT REVERSE BEND	37697	Y			

VALECHA ENGINEERING LTD
Contractor



SCALE
1:100
2:100
3:100

Chief Engineer
World Bank Project
Govt. of Odisha
Bhubaneswar.

CLIENT :-
WORKS DEPARTMENT
GOVT. OF ODISHA

CEG
CONSULTING ENGINEERS GROUP LTD.
E-12, Moj Colony, Malviya Nagar Jaipur-17
Tel: +91-141-2520899, 2521899, 2520556
Fax: 2521348, e-mail: ceg@cegidia.com

SCHEDULE OF SIGN POST (05 of 09)

(JAGATPUR TO DUHURIA)

DRG NO.	OSR/PC/CG/JC-10A/KM/SC/1105	DATE	REV	R-1	DESIGNER/DR	DRAWN BY	PREPARED BY	APPROVED
SH. NO.	153	12/12/12			CEG	CEG	EE, PMU	CE, WBP
SCALE								

CLERK: RAJESH KUMAR
PROJECT: STATE ROAD PROJECT
SIGN POST SHALL BE INSTALLED AT AN INTERVAL OF 200
METERS APPROXIMATELY.

SCHEDULE OF TRAFFIC SIGNS (JAGATPUR - DUHURIA)

SIGN POST ID SP-12	DESCRIPTION OF SIGN BOARD PEDESTRIAN CROSSING	CHAINAGE	LEFT LANE	RIGHT LANE	CR (L)	CR (R)
19485			Y			
19528			Y			
19561			Y			
19585				Y		
19628				Y		
19661				Y		
20027			Y			
20127			Y			
20303			Y			
20403			Y			
23903			Y			
23991			Y			
24003				Y		
24091				Y		
24303			Y			
24403			Y			
26598			Y			
26684			Y			
26698				Y		
26784				Y		
26903			Y			
27003			Y			
27163			Y			
27263			Y			
27396			Y			
27496			Y			
30953			Y			
31053			Y			
32853			Y			
32953			Y			
33703			Y			
33803			Y			
35572			Y			
35672			Y			
36923			Y			
37023			Y			
37803			Y			
37903			Y			
38373			Y			
38473			Y			
38573			Y			
38673			Y			
43323			Y			
43333			Y			
43693			Y			
43793			Y			
44803			Y			
48012			Y			
48103			Y			
48112			Y			
48203			Y			
1858				Y		
6514			Y			
9076				Y		
10918				Y		
13944				Y		
16935				Y		
20102				Y		
21390				Y		

VALECHA ENGINEERING LTD.
Contractor



4 CURVE CHAINS ROAD RIGHT
5 FOR DETAILS OF ROAD SIGNS REFER DRAWING STANDARD DRAWING
6 SIGN POST SHALL BE INSTALLED AT AN EQUAL DISTANCE FROM
7 FROM THE EDGE OF FOOTPATH WAY

NOTE
1. LEFT LANE
2. RIGHT LANE
3. CROSS ROAD

SCHEDULE OF SIGN POST (06 of 09)			
(JAGATPUR TO DUHURIA)			
DRG NO.	OSRP/CEG/JC-106/KM/SCI/06	DESIGNED BY	CEG
SIT. NO.	154	DATE	21/12/12
SCALE		REV	R-1
		NTS	
		CEG	
		CEG	
		EE, PMU	
		APPROVED	CE, WBP

CONSULTING
ENGINEERS GROUP LTD.
E-12, Moji Colony, Maivya Nagar Jaipur-17
Tel: +91-141-2520899, 2521899, 2520556
Fax: 2521348, e-mail: ceg@egindia.com

CLIENT :-
WORKS DEPARTMENT
GOVT. OF ODISHA

PROJECT :-
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

WORLD BANK ASSISTANCE
FOR THE STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE
FOR THE STATE ROAD PROJECT

VALECHA ENGINEERING LTD.
Bhubaneswar, Odisha

SCHEDULE OF TRAFFIC SIGNS (JAGATPUR - DUHURIA)

SIGN POST ID	DESCRIPTION OF SIGN BOARD	CHAINAGE	LEFT LANE	RIGHT LANE	CR (L)	CR (R)	CHAINAGE	LEFT LANE	RIGHT LANE	CR (L)	CR (R)
SP - 14C	RIGHT SIDE ROAD - Y	2769		Y	Y		38584		Y	Y	
		2955		Y	Y		38753		Y	Y	
		3156		Y	Y		38915		Y	Y	
		5190		Y	Y		38960		Y	Y	
		5716		Y	Y		39350		Y	Y	
		6040	Y	Y	Y		40812	Y	Y	Y	
		6146		Y	Y		41474		Y	Y	
		6348		Y	Y		42153		Y	Y	
		6774	Y	Y	Y		42512	Y	Y	Y	
		7670		Y	Y		43071		Y	Y	
		7841	Y	Y	Y		43410	Y	Y	Y	
		10828		Y	Y		43690		Y	Y	
		10908		Y	Y		43989		Y	Y	
		13143		Y	Y		44455		Y	Y	
		13560	Y	Y	Y		44833	Y	Y	Y	
		13866		Y	Y		45515		Y	Y	
		13914		Y	Y		45870		Y	Y	
		15676		Y	Y		46281		Y	Y	
		16680	Y	Y	Y		47160	Y	Y	Y	
		16861		Y	Y		47695		Y	Y	
		16925		Y	Y		48375		Y	Y	
		18688	Y	Y	Y		2003	Y	Y	Y	
		18787		Y	Y		2161		Y	Y	
		19612	Y	Y	Y		10487	Y	Y	Y	
		19801		Y	Y		10604		Y	Y	
		20092		Y	Y		15797		Y	Y	
		21380		Y	Y		15917		Y	Y	
		21921		Y	Y		1744		Y	Y	
		24090	Y	Y	Y		2257	Y	Y	Y	
		24460		Y	Y		6895		Y	Y	
		24843	Y	Y	Y		7187	Y	Y	Y	
		25643		Y	Y		2213		Y	Y	
		25713		Y	Y		2442		Y	Y	
		26073		Y	Y		4066		Y	Y	
		26279	Y	Y	Y		4239	Y	Y	Y	
		26845		Y	Y		4246		Y	Y	
		28017		Y	Y		4368		Y	Y	
		28123		Y	Y		4459		Y	Y	
		28134	Y	Y	Y		4600	Y	Y	Y	
		28192		Y	Y		5292		Y	Y	
		28244	Y	Y	Y		5530	Y	Y	Y	
		28925		Y	Y		5608		Y	Y	
		29668	Y	Y	Y		5822	Y	Y	Y	
		29703		Y	Y		10183		Y	Y	
		32615		Y	Y		10412		Y	Y	
		32852		Y	Y		18048		Y	Y	
		33103	Y	Y	Y		18247	Y	Y	Y	
		33652		Y	Y		18672		Y	Y	
		33695		Y	Y		18874		Y	Y	
		34038	Y	Y	Y		19425	Y	Y	Y	
		35305		Y	Y		19467		Y	Y	
		35748		Y	Y		19521		Y	Y	
		35800	Y	Y	Y		19644	Y	Y	Y	
		35838		Y	Y		19689		Y	Y	
		36227		Y	Y		19701		Y	Y	
		36300	Y	Y	Y		19987	Y	Y	Y	
		36760		Y	Y		20167		Y	Y	
		37154	Y	Y	Y		23951	Y	Y	Y	
		37202		Y	Y		24131		Y	Y	
		37953		Y	Y		26558		Y	Y	

SCALE: 1:500
 4. CHECK FOR CROSS ROAD RIGHT
 5. FOR DE TAIL OF ROAD SIGN REFER DRAWING IN STANDARD DRAWINGS
 6. SIGN POST SHALL BE INSTALLED AT AN INTERVAL OF 100 M.
 FROM THE EDGE OF THE HIGHWAY

SCHEDULE OF SIGN POST (08 of 09)
 (JAGATPUR TO DUHURIA)

DRG NO.	OSRP/CEG/IC-106KM/SCH/08	DESIGNED BY	CEG	DRAWN BY	CEG	PREPARED BY	EE, PMU	APPROVED	CE, WBP
SII. NO.	156	DATE	12/12/12	RIV	R-I				
SCALE							NTS		

CONSULTING ENGINEERS GROUP LTD.
 E-12, Moj Colony, Marvya Nagar Jaipur-17
 Tel: +91-141-2520899, 2521899, 2520556
 Fax: 2521348, e-mail: ceg@cegroupindia.com

CLIENT :-
WORKS DEPARTMENT
GOVT. OF ODISHA

PROJECT :-
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE



Chief Engineer
 World Bank
 D/o the E.C.C. Unit, Bhubaneswar.

SCHEDULE OF TRAFFIC SIGNS (JAGATPUR - DUHURIA)

SIGN POST ID	DESCRIPTION OF SIGN BOARD	CHAINAGE	LEFT LANE	RIGHT LANE	CR (L)	CR (R)	CHAINAGE	LEFT LANE	RIGHT LANE	CR (L)	CR (R)
SP-16A	HUMP	36605	Y				47725				Y
		26738		Y			48405				Y
		26863		Y			1000	Y			
		27356		Y			6000		Y		
		27536		Y			11000		Y		
		35532		Y			16000		Y		
		35712		Y			21000		Y		
		36856		Y			26000		Y		
		37090		Y			31000		Y		
		47972		Y			36000		Y		
		48152		Y			41000		Y		
		182			Y		46000		Y		
		510		Y			2525	Y			
		1183		Y			2705	Y			
		1366		Y			14747	Y			
		1806		Y			14976	Y			
		1818		Y			17644	Y			
		2184		Y			17860	Y			
		2854		Y			30276	Y			
		5160		Y			30456	Y			
		7640		Y			40210	Y			
		9486		Y			40434	Y			
		10858		Y			2213	Y			
		10878		Y			2442	Y			
		13896		Y			18048	Y			
		13904		Y			18247	Y			
		15646		Y			19425	Y			
		16650		Y			19521	Y			
		16891		Y			19644	Y			
		18658		Y			19701	Y			
		18817		Y			19987	Y			
		19556		Y			20167	Y			
		19771		Y			21951	Y			
		20028		Y			24131	Y			
		21312		Y			26558	Y			
		21350		Y			26605	Y			
		24120		Y			26738	Y			
		24430		Y			26863	Y			
		26815		Y			27356	Y			
		33133		Y			27536	Y			
		35335		Y			35532	Y			
		35718		Y			35712	Y			
		36270		Y			47972	Y			
		36730		Y			48152	Y			
		37172		Y							
		37184		Y							
		37910		Y							
		38554		Y							
		38723		Y							
		38930		Y							
		38945		Y							
		39380		Y							
		40782		Y							
		41446		Y							
		41504		Y							
		43380		Y							
		44640		Y							
		44645		Y							
		47556		Y							

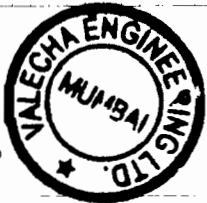
3. URBAN ROADS BOARD
 4. FOR DETAILS OF ROAD SIGNATURE, STANDARDS, DRAWINGS
 6. SIGNATURE SHEET BY PROJECT LEAD AT JAGATPUR TO DUHURIA
 7. DRAWN BY: CEG

SCHEDULE OF SIGN POST (09 of 09)			
(JAGATPUR TO DUHURIA)			
DESIGNED BY	DRAWN BY	PREPARED BY	APPROVED
CEG	CEG	EE, PMU	CE, WBP
DRG. NO.	OSR/CEG/JC-106KM/SCH/09	REV	R-1
SIL. NO.	157	DATE	12/12/12
SCALE	NTS		

CONSULTING ENGINEERS GROUP LTD.
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 Tel: +91-141-2520899, 2521899, 2520556
 Fax: 2521348, e-mail: ceg@cegindia.com

CLIENT :-
WORKS DEPARTMENT
GOVT. OF ODISHA

PROJECT :-
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE



VALECHA ENGINEERING LTD
 Contractor

SCALE
 1:1
 1:1
 1:1

Checked by: R. Swar
 World Bank Project
 the Govt. of Odisha
 R. Swar

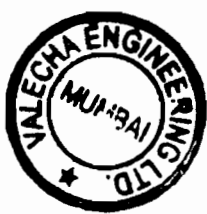
SCHEDULE OF EXTRA WIDENING - JAGATPUR TO DUHURJA

SL NO	CURVE START	CURVE END	RADIUS	TRANSITION	EXTRA WIDENING
1	1818.949	1860.641	200	35	0.6
2	1965.629	2013.903	100	45	0.9
3	2154.163	2171.745	100	45	0.9
4	2274.907	2317.893	200	35	0.6
5	2989.005	3025.840	240	50	0.6
6	5218.572	5239.779	240	90	0.6
7	6959.518	6968.222	300	25	0.6
8	7039.313	7121.609	300	25	0.6
9	7215.696	7222.505	300	25	0.6
10	17326.444	17348.224	240	50	0.6
11	22826.188	22924.735	300	40	0.6
12	23102.874	23149.152	300	40	0.6
13	24125.115	24167.410	240	50	0.6
14	33792.786	33801.593	240	90	0.6
15	38023.996	38039.891	170	70	0.6
16	43352.697	43381.918	240	50	0.6
17	48405.059	48414.574	170	70	0.6
18	53378.929	53407.808	170	70	0.6
19	56071.321	56079.308	170	70	0.6
20	56568.141	56595.616	200	60	0.6
21	61930.372	61960.777	300	75	0.6
22	63021.807	63073.818	150	45	0.6
23	64284.318	64390.282	240	50	0.6
24	64916.545	65009.843	300	75	0.6
25	72262.833	72279.659	240	50	0.6
26	72436.042	72467.132	200	60	0.6
27	72943.170	72951.462	240	90	0.6
28	73383.327	73439.961	300	40	0.6
29	85632.710	85774.516	300	40	0.6
30	85930.013	85975.255	150	80	0.6
31	87011.413	87041.670	150	80	0.6
32	88621.641	88901.508	260	50	0.6
33	89670.970	89831.892	200	60	0.6
34	91087.592	91217.435	200	60	0.6
35	91571.153	91622.021	170	70	0.6
36	92593.219	92658.111	300	40	0.6
37	93369.302	93374.644	300	75	0.6
38	97585.959	97702.261	300	75	0.6
39	98064.485	98112.098	300	40	0.6
40	98581.936	98749.662	155	70	0.6
41	98978.778	99077.535	200	60	0.6
42	99354.244	99450.560	200	60	0.6
43	100166.769	100186.072	200	60	0.6
44	100543.049	100570.018	200	60	0.6

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 THE WIDENING SECTIONS

VALECHA ENGINEERING LTD.
Contractor



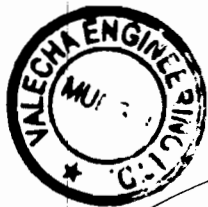
Chief Engineer,
World Bank Project,
Under World Bank Assistance,
Rhubaneswar.

CLIENT :-
**WORKS DEPARTMENT
GOVT. OF ODISHA**

**CONSULTING
ENGINEERS GROUP LTD.**
E-12, McJ Colony, Malviya Nagar, Jaipur-17
Tel: +91-141-2520899, 2520556
Fax: 2521348, e-mail: ceg@cegroupindia.com

SCHEDULE OF EXTRA WIDENING
(JAGATPUR TO DUHURJA)

DRG. NO.	OSRP/CEG/JD-49KM/SCT/17	DESIGNED BY	CEG	DRAWN BY	CEG	PREPARED BY	EE., PMU	APPROVED	CE, WBP
SII. NO.	161	DATE	12/12/12	REV	R-1				
SCALE			NTS						



VALECHA ENGINEERING LTD.
Contractor

SCHEDULE FOR PAVEMENT COMPOSITION AND TYPE OF CONSTRUCTION FOR JAGATPUR - DUHURIA

Sl.No.	Proposed Chaining		Distance in KMS	Thickness Design (RC-37)												Type of Construction			
	From	To		Crust Details Over Existing Pavement						Crust Details for Widening							Total Thickness		
				Surface Course	Sub Base	Embankment	Total Thickness	Surface Course	DBM	Base	WMM1	WMM2	Sub Base	Sub Base	Sub grade				
DBM	BC	Sub Base	WMM1	WMM2	GSB	Sub Base	Sub grade	Fill	Embankment	Total Thickness	BC	DBM	Base	WMM1	WMM2	Sub Base	Sub Base	Sub grade	Total Thickness
1	1.90	3.15	1.25	90	40	200	100	150	200	-	580	40	90	100	150	200	500	1080	RECONSTRUCTION
2	3.15	3.35	0.20	90	40	200	100	150	200	500	1080	40	90	100	150	200	500	1080	RECONSTRUCTION
3	3.35	3.85	0.50	90	40	200	100	150	200	-	580	40	90	100	150	200	500	1080	RECONSTRUCTION
4	4.30	4.60	0.30	90	40	200	100	150	200	-	580	40	90	100	150	200	500	1080	RECONSTRUCTION
5	4.60	5.50	0.90	90	40	200	100	150	200	500	1080	40	90	100	150	200	500	1080	RECONSTRUCTION
6	5.50	5.80	0.30	90	40	200	100	150	200	-	580	40	90	100	150	200	500	1080	RECONSTRUCTION
7	7.20	7.55	0.35	90	40	200	100	150	200	500	1080	40	90	100	150	200	500	1080	RECONSTRUCTION
8	7.95	9.30	1.35	90	40	200	100	150	200	500	1080	40	90	100	150	200	500	1080	RECONSTRUCTION
9	9.66	10.10	0.44	90	40	200	100	150	200	500	1080	40	90	100	150	200	500	1080	RECONSTRUCTION
10	10.48	10.70	0.22	90	40	200	100	150	200	-	580	40	90	100	150	200	500	1080	RECONSTRUCTION
11	10.70	13.60	2.90	90	40	200	100	150	200	500	1080	40	90	100	150	200	500	1080	RECONSTRUCTION
12	13.60	14.00	0.40	90	40	200	100	150	200	-	580	40	90	100	150	200	500	1080	RECONSTRUCTION
13	14.00	15.55	1.55	90	40	200	100	150	200	500	1080	40	90	100	150	200	500	1080	RECONSTRUCTION
14	15.55	16.30	0.75	90	40	200	100	150	200	500	1080	40	90	100	150	200	500	1080	RECONSTRUCTION
15	16.30	16.60	0.30	90	40	200	100	150	200	-	580	40	90	100	150	200	500	1080	RECONSTRUCTION
16	17.10	17.70	0.60	90	40	200	100	150	200	500	1080	40	90	100	150	200	500	1080	RECONSTRUCTION
17	20.80	21.10	0.30	90	40	200	100	150	200	-	580	40	90	100	150	200	500	1080	RECONSTRUCTION
18	21.10	22.15	1.05	90	40	200	100	150	200	500	1080	40	90	100	150	200	500	1080	RECONSTRUCTION
19	22.15	22.50	0.35	90	40	200	100	150	200	-	580	40	90	100	150	200	500	1080	RECONSTRUCTION
20	22.50	24.00	1.50	90	40	200	100	150	200	500	1080	40	90	100	150	200	500	1080	RECONSTRUCTION
21	24.25	25.00	0.75	90	40	200	100	150	200	500	1080	40	90	100	150	200	500	1080	RECONSTRUCTION
22	25.00	26.60	1.60	90	40	200	100	150	200	500	1080	40	90	100	150	200	500	1080	RECONSTRUCTION
23	26.60	27.25	0.65	90	40	200	100	150	200	-	580	40	90	100	150	200	500	1080	RECONSTRUCTION
24	28.40	29.55	1.15	90	40	200	100	150	200	500	1080	40	90	100	150	200	500	1080	RECONSTRUCTION
25	29.55	29.85	0.30	90	40	200	100	150	200	-	580	40	90	100	150	200	500	1080	RECONSTRUCTION
26	29.85	32.65	2.80	90	40	200	100	150	200	500	1080	40	90	100	150	200	500	1080	RECONSTRUCTION
27	33.20	35.25	2.05	90	40	200	100	150	200	500	1080	40	90	100	150	200	500	1080	RECONSTRUCTION
28	35.90	38.10	2.20	90	40	200	100	150	200	500	1080	40	90	100	150	200	500	1080	RECONSTRUCTION
29	38.10	38.40	0.30	90	40	200	100	150	200	-	580	40	90	100	150	200	500	1080	RECONSTRUCTION
30	38.40	38.60	0.20	90	40	200	100	150	200	500	1080	40	90	100	150	200	500	1080	RECONSTRUCTION
31	39.55	41.40	1.85	90	40	200	100	150	200	500	1080	40	90	100	150	200	500	1080	RECONSTRUCTION
32	41.60	43.00	1.40	90	40	200	100	150	200	500	1080	40	90	100	150	200	500	1080	RECONSTRUCTION
33	43.00	43.30	0.30	90	40	200	100	150	200	-	580	40	90	100	150	200	500	1080	RECONSTRUCTION
34	43.60	44.30	0.70	90	40	200	100	150	200	500	1080	40	90	100	150	200	500	1080	RECONSTRUCTION
35	44.80	45.75	0.95	90	40	200	100	150	200	500	1080	40	90	100	150	200	500	1080	RECONSTRUCTION
36	45.75	46.00	0.25	90	40	200	100	150	200	-	580	40	90	100	150	200	500	1080	RECONSTRUCTION
37	46.00	47.95	1.95	90	40	200	100	150	200	500	1080	40	90	100	150	200	500	1080	RECONSTRUCTION
38	47.95	49.00	0.30	90	40	200	100	150	200	-	580	40	90	100	150	200	500	1080	RECONSTRUCTION

Note:
1. The pavement design has been based on IRC-37, 2003 & IRC-81-1977
2. The Borrowed CBR from local area (0.3) shall be used for new construction section
3. Existing subgrade shall be used where the reconstructions are proposed
4. The Typical Cross Sections applicable for different sections are given in STANDARD DRAWINGS SET
5. Lined Drain with 10mm Crust Carriageway + 1.5m Paved Shoulder shall be provided
Refer Diag. No. TCS-4, TC-5 & TC-6

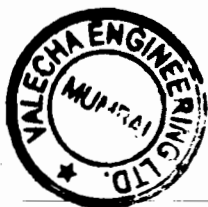
DRG NO.	IOSRP/CEG/JD-49/PAV/01	DESIGNED BY	CEG	DRAWN BY	CEG	PREPARED BY	EE, PMU	APPROVED	CE, WBP
SHEET NO.	168	DATE	12/12/12	REV	R-1	NTS			
SCALE									

CONSULTING ENGINEERS GROUP LTD.
E-12, Moj Colony, Malviya Nagar, Jaipur-17
Tel: +91-141-2520899, 2520556
Fax: 2521348, e-mail: ceg@cegroup.com

CLIENT :-
**WORKS DEPARTMENT
GOVT. OF ODISHA**

PROJECT :-
**ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE**

0/o the E.I.C. Group, Odisha
Bhubaneswar.



Thickness Design (IRC: 58-2002) - RIGID PAVEMENT

S No	Chainage		Length	PQC Slab, mm	Seperatl on layer, Micron	Subbase (DLC) mm	Subbase GSB mm	Subgrade mm	Embankme nt mm	Total Thickness	Remarks
	From	To									
1	0.00	1.90	1.90	300	125	150	150	500	500	1600	DFS
2	3.85	4.30	0.45	300	125	150	150	500	-	1100	-
3	5.80	7.20	1.40	300	125	150	150	500	-	1100	-
4	7.55	7.95	0.40	300	125	150	150	500	-	1100	-
5	9.30	9.66	0.36	300	125	150	150	500	-	1100	-
6	10.10	10.48	0.38	300	125	150	150	500	-	1100	-
7	16.60	17.10	0.50	300	125	150	150	500	-	1100	-
8	17.70	20.80	3.10	300	125	150	150	500	-	1100	-
9	24.00	24.25	0.25	300	125	150	150	500	500	1600	DFS
10	27.25	28.40	1.15	300	125	150	150	500	-	1100	-
11	32.65	33.20	0.55	300	125	150	150	500	-	1100	-
12	35.25	35.90	0.65	300	125	150	150	500	-	1100	-
13	38.60	39.00	0.40	300	125	150	150	500	-	1100	-
14	39.00	39.55	0.55	300	125	150	150	500	500	1600	DFS
15	41.40	41.60	0.20	300	125	150	150	500	500	1600	DFS
16	43.30	43.60	0.30	300	125	150	150	500	-	1100	-
17	44.30	44.80	0.50	300	125	150	150	500	-	1100	-
18	48.25	49.00	1.75	300	125	150	150	500	-	1100	-

CLIENT :-

WORKS DEPARTMENT
GOVT. OF ODISHA

CONSULTING ENGINEERS GROUP LTD.
E-12, MeJ Colony, Malviya Nagar Jaipur-17
Tel: +91-141-2520899, 2521899, 2520556
Fax: 2521348, e-mail: ceg@cegroupindia.com

SCHEDULE FOR PAVEMENT COMPOSITION AND TYPE OF CONSTRUCTION
(JAGATPUR TO DUHURIA)

DRG NO.	OSRP/CEG/PAV/02	DESIGNED BY	CEG	CEG	CEG	PREPARED BY	EE, PMU	APPROVED	CE, WBP
SH. NO.	170	DATE	12/2012	REV	R-1				
SCALE			NTS						

Chief Engineer
Works Department
Govt. of Odisha
Bhubaneswar

TCS-02

VALECHA ENGINEERING LTD
Contractor

EARTHEN SHOULDER 3.0%

CARRIAGEWAY

2.5%

2.5%

EARTHEN SHOULDER 3.0%

EXISTING PAVEMENT TO BE REMOVED AND RECONSTRUCTED

EXISTING SUBGRADE TO BE RETAINED

TYPICAL CROSS SECTION IN OPEN AREA (WITHOUT PAVED SHOULDER) FOR RECONSTRUCTION / WIDENING

LEGENDS

1) BC	6) DLC
2) DBM	7) PCC
3) WMM	8) EARTH FILL
4) GSB	9) SAND FILL
5) SUBGRADE	10) E - Electricity Cable
	11) T - Telecom Cable

TCS-08

UNPAVED SHOULDER 3.0%

PAVED SHOULDER 2.5%

CARRIAGEWAY

2.5%

2.5%

UNPAVED SHOULDER 3.0%

EXISTING PAVEMENT TO BE REMOVED AND RECONSTRUCTED

EXISTING SUBGRADE TO BE RETAINED

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

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS
2. FOR DRAIN DETAILS REFER DRAWING NO. OSR/PC/EGOR
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/EGRID/02
5. FOR PAVEMENT EDGE DETAILS REFER DRAWING NO. OSR/PC/EGOD
6. PCC PROFILE CORRECTIVE COURSE WITH THE MATERIAL SAME AS THAT OF OVERLAYING LAYER ABOVE IT.
7. CHINAGE THE UTILITIES/STRESS OBSTRUCTING THE LONGITUDINAL DRAINS.
8. THE DRAINS MAY BE DIVERTED AS PER ENGINEERS DIRECTIONS

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 - Electricity Cable	
	11) T - Telecom Cable	

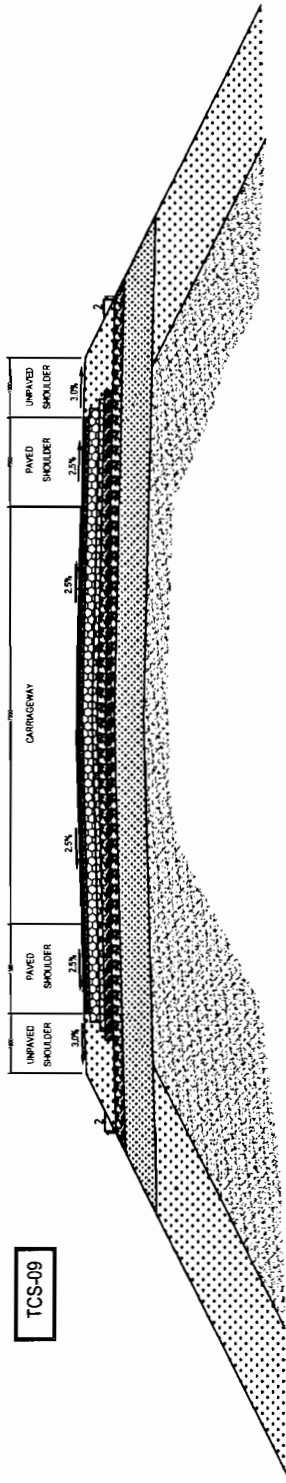
PROJECT:-
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

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

DRG. NO.	OSR/PC/EGOR/JAGATPUR/08/08/08	DESIGNED BY	CEG	CEG	CEG	APPROVED (D)
SH. NO.	D1	DATE	12/12/12	REV	R-1	PREPARED BY
SCALE			NTS			EE(PMU)
						CE, WBIP

Volume-IV: Page 91 of 160

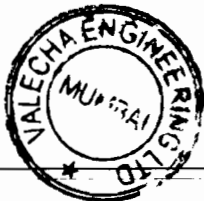
Chief Engineer
World Bank Project Engineer
O/o the E. & S. Division, Jaipur
Bhubaneswar.



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

TCS-09

VALECHA ENGINEERING LTD
Contractor



LEGENDS

- 1) BC
- 2) DBM
- 3) WMM
- 4) GSB
- 5) SUBGRADE
- 6) DLC
- 7) PCC
- 8) EARTH FILL
- 9) E - Electricity Cable
- 10) T - Telecom Cable
- 11) W - Water Supply Line
- 12) G - Gas Line
- 13) S - Sewer

1. ALL DIMENSIONS ARE IN MILLIMETERS
 2. FOR DRAIN DETAILS REFER DRAWING NO. OSR/PC/CEG/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/CEG/RIGID 02.
 5. FOR PAVEMENT EDGE DETAILS REFER DRAWING NO. OSR/PC/CEG/ED
 6. PCC-PROFILE CORRECTIVE COURSE WITH THE MATERIAL SAME AS THAT OF OVERLAYING LAYER ABOVE IT.
- PLEASE THE UTILITIES/TREES OBSTRUCTING THE LONGITUDINAL DRAINS. THE DRAINS MAY BE DIVERTED AS PER ENGINEERS DIRECTIONS

**TYPICAL CROSS-SECTION
TCS - 09**

(JAGATPUR - DUHURIA)

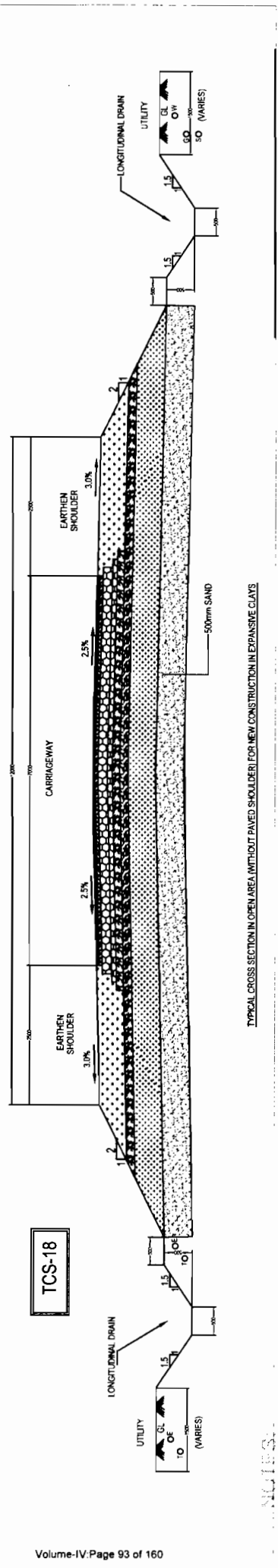
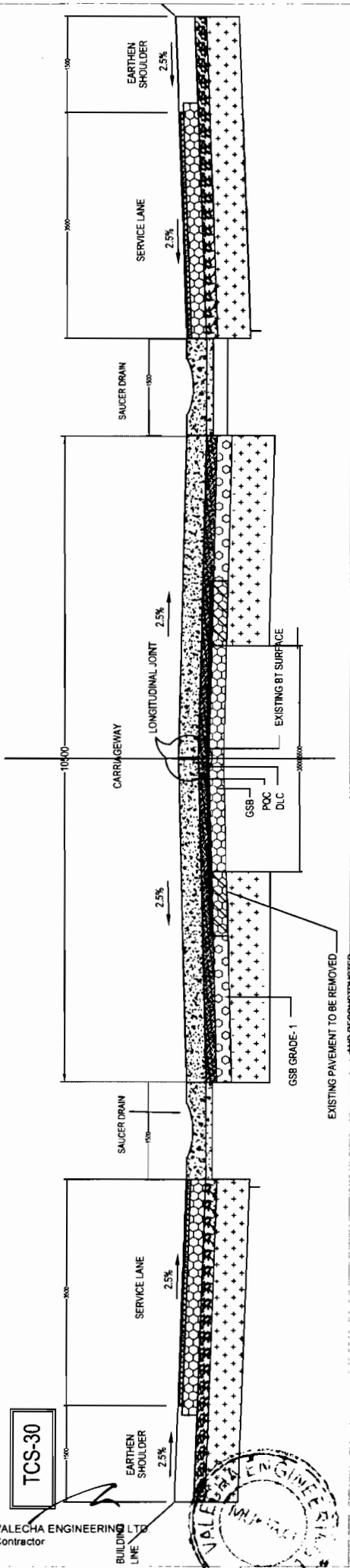
DRG NO.	OSR/PC/CEG/JR/AM/TCS/DR	DESIGNED BY	CEG	CEG	CEG	REV	R-1	DATE	12/12/12	REV	R-1	APPROVED (D)	CE, WBP
SH. NO.	02	DATE	12/12/12	REV	R-1	SCALE	NTS	DESIGNED BY	CEG	CEG	CEG	PREPARED BY	EE (PMU)

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@cegroupindia.com



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



TYPICAL CROSS SECTION IN OPEN AREA (WITHOUT PAVED SHOULDER) FOR NEW CONSTRUCTION IN EXPANSIVE CLAYS

LEGENDS

1) MC	6) B.C	11) New Subst. 1m
2) DM	7) PCC	12) Old Subst.
3) WBM	8) Earth F.L.	13) S. Stone
4) GSB	9) E. Density Calc.	
5) Subgrade	10) T. Masonry Code	

**TYPICAL CROSS-SECTION
TCS - 30 & TCS-18
(JAGATPUR - DUJHURIA)**

DRG NO.	DESIGNED BY	DRAWN BY	REV	DATE	REV	DATE	REV	DATE	REV	DATE
SH. NO.	05	05	12/12/12	05	12/12/12	05	12/12/12	05	12/12/12	05
SCALE			R-1		R-1		R-1		R-1	
			CEG		CEG		CEG		CEG	
			NTS		NTS		NTS		NTS	
			EE(PMU)		EE(PMU)		EE(PMU)		EE(PMU)	
			CE.WBP		CE.WBP		CE.WBP		CE.WBP	

PROJECT:-
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

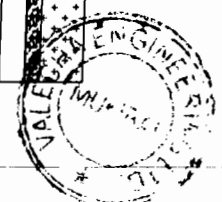
CONSULTING ENGINEERS GROUP LTD.
E-12, Moji Colony, Malviya Nagar Jaipur-17
Tel: +91-141-2520899, 2521899, 2520556
Fax: 2521348, e-mail: ceg@cegindia.com

CEG

NOTES:-

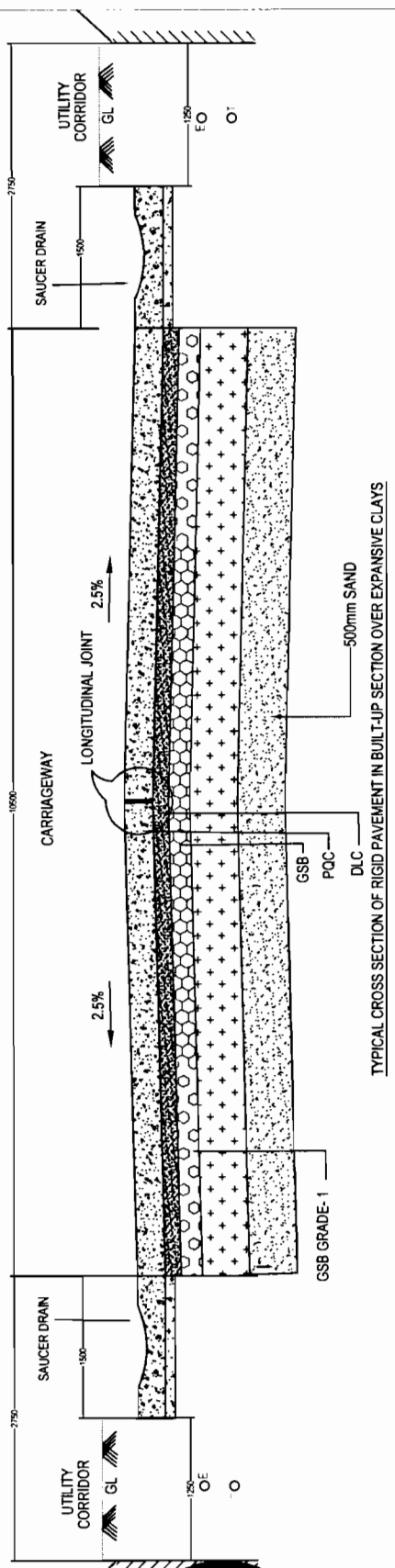
1. ALL DIMENSIONS ARE IN MILLIMETERS
2. FOR DRAIN DETAILS REFER DRAWING NO. OSRPP/CEGOR
3. FOR LAYER THICKNESS DETAILS REFER SCHEDULE OF WIDENING AND LAYER THICKNESS DETAILS
4. THE CROSS SECTIONS SHALL BE READ WITH DETAILS OF TRANSITION BETWEEN RIGID AND FLEXIBLE REFER DRAWING NO. OSRPP/CEGRIGID 02
5. FOR PAVEMENT EDGE DETAILS REFER DRAWING NO. OSRPP/CEGOOD
6. PCC PROFILE CORRECTIVE COURSE WITH THE MATERIAL SAME AS THAT OF OVERLAYING LAYER ABOVE IT.
7. IN CASE THE UTILITIES/STREES OBSTRUCTING THE LONGITUDINAL DRAINS, THE DRAINS MAY BE DIVERTED AS PER ENGINEERS DIRECTIONS

VALECHA ENGINEERING LTD
Contractor



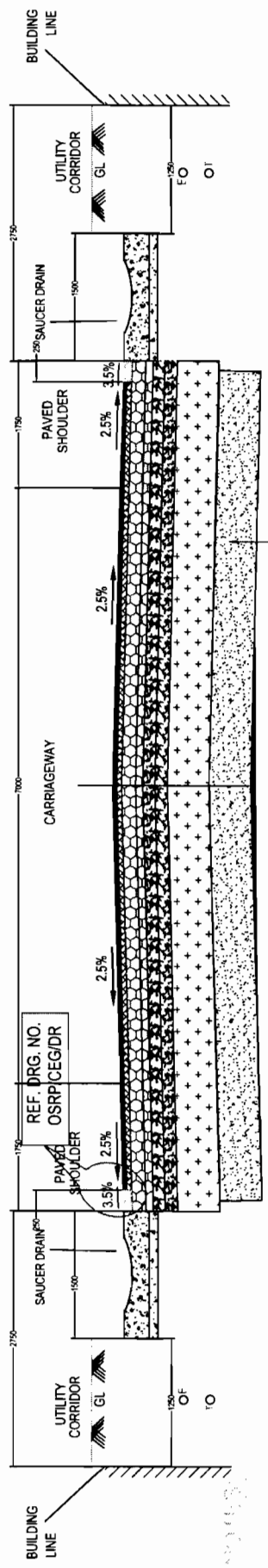
Office: (Civil) Engineer,
World Bank Project, Odisha
O/o the E.I.C.(Civil), Odisha
Bhubaneswar.

TCS-32



TYPICAL CROSS SECTION OF RIGID PAVEMENT IN BUILT-UP SECTION OVER EXPANSIVE CLAYS

TCS-33



TYPICAL CROSS SECTION IN BUILT-UP AREA FOR NEW CONSTRUCTION IN EXPANSIVE CLAYS

LEGENDS

1) BC	6) DLC	11) W - Water Supply Line
2) GSB	7) POC	12) G - Gas Line
3) W/SB	8) EARTH FILL	13) S - Sewer
4) GSB	9) E - Electricity Cable	
5) SUBGRADE	10) T - Telecom Cable	

TYPICAL CROSS-SECTION
TCS - 32 & TCS - 33

(JAGATPUR - DUHURIA)

PROJECT:-
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

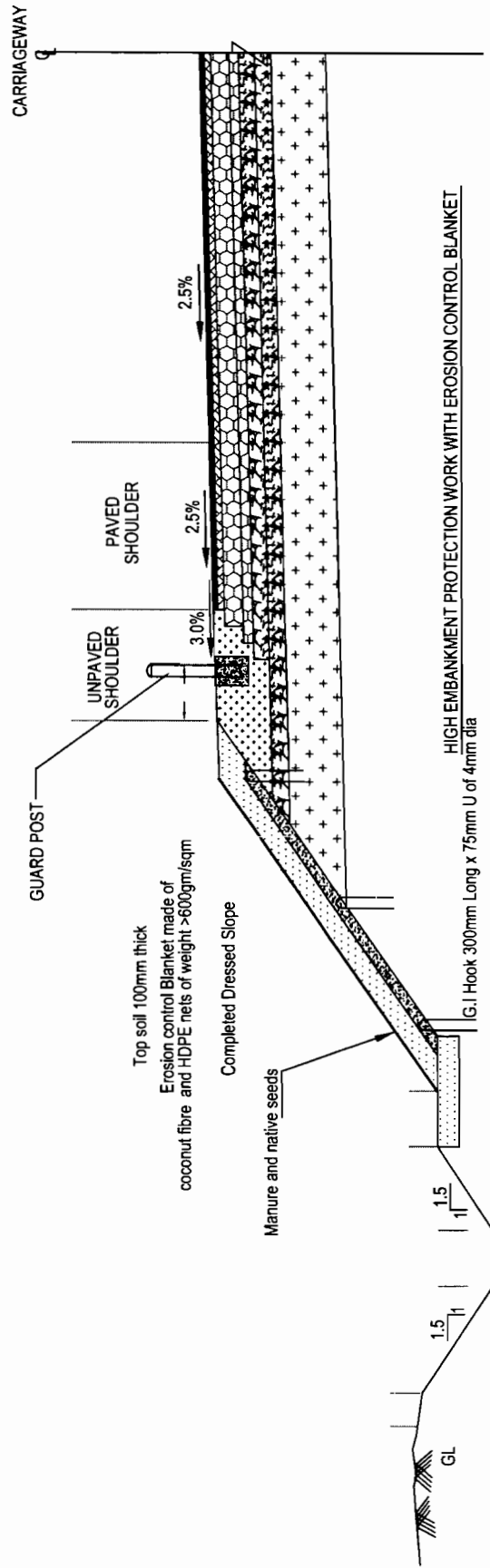
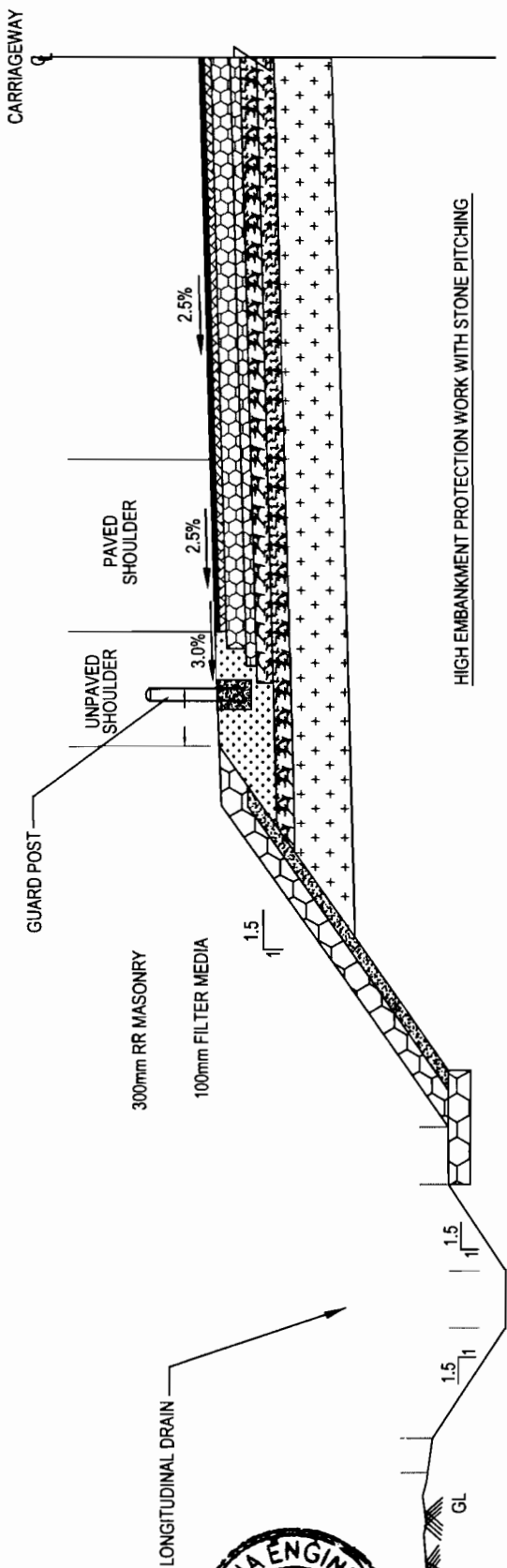
CONSULTING ENGINEERS GROUP LTD.
E-12, Moji Colony, Malviya Nagar Jaipur-17
Teli: +91-141-2520899, 2521899, 2520556
Fax: 2521348, e-mail: ceg@cegroupindia.com



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

DRG NO.	OSR/CEG/TCS32 & 33	DESIGNED BY	CEG	DRAWN BY	CEG	REV. R-1	APPROVED (D)
SH. NO.	06	DATE	12/12/14	REV	CEG	PREPARED BY	EE(PMU)
SCALE			NTS				CE/WBP





STANDARD DRAWINGS FOR SLOPE PROTECTION WORK
(JAGATPUR - DUHURIA)

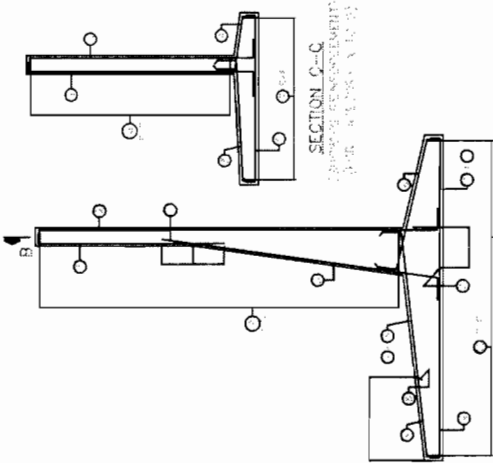
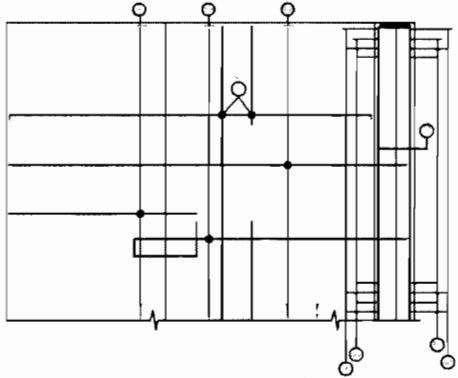
DRG NO.	OSR/CEG/PMU	DESIGNED BY	C.E.G.	DRAWN BY	C.E.G.	REV/RT	APPROVED ID
SH. NO.	11	DATE	12/12/12	REV	R-1	PREPARED BY	EE(PMU)
SCALE	NTS						CE.WBP

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

NOTES

1. All dimensions are in meters unless otherwise specified.
2. The wall is to be constructed in concrete.
3. The wall is to be finished with smooth plaster on both sides.
4. The wall is to be painted with white wash.
5. The wall is to be constructed in accordance with the specifications of IS:456-1978.
6. The wall is to be constructed in accordance with the specifications of IS:1786-1968.
7. The wall is to be constructed in accordance with the specifications of IS:1786-1968.
8. The wall is to be constructed in accordance with the specifications of IS:1786-1968.
9. The wall is to be constructed in accordance with the specifications of IS:1786-1968.
10. The wall is to be constructed in accordance with the specifications of IS:1786-1968.

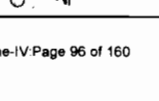
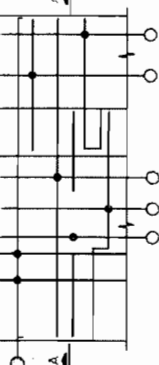
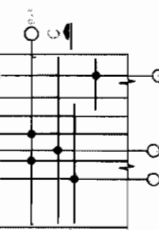
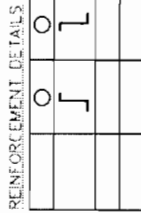


SECTION B-B

CROSS SECTION OF RETAINING WALL

SECTION A-A

CROSS SECTION OF RETAINING WALL



REINFORCEMENT DETAILS

PLAN SHOWING REINFORCEMENT IN BASE SLAB

PLAN SHOWING REINFORCEMENT IN BASE SLAB

QUANTITY

SL	LOCATION	QTY	UNIT
01	SECTION A-A	...	...
02	SECTION B-B	...	...
03	SECTION C-C	...	...
04	...	...	...

REINFORCEMENT DETAILS	QTY	UNIT
...
...
...

REINFORCEMENT DETAILS	QTY	UNIT
...
...
...

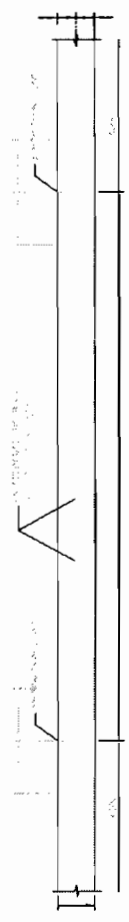
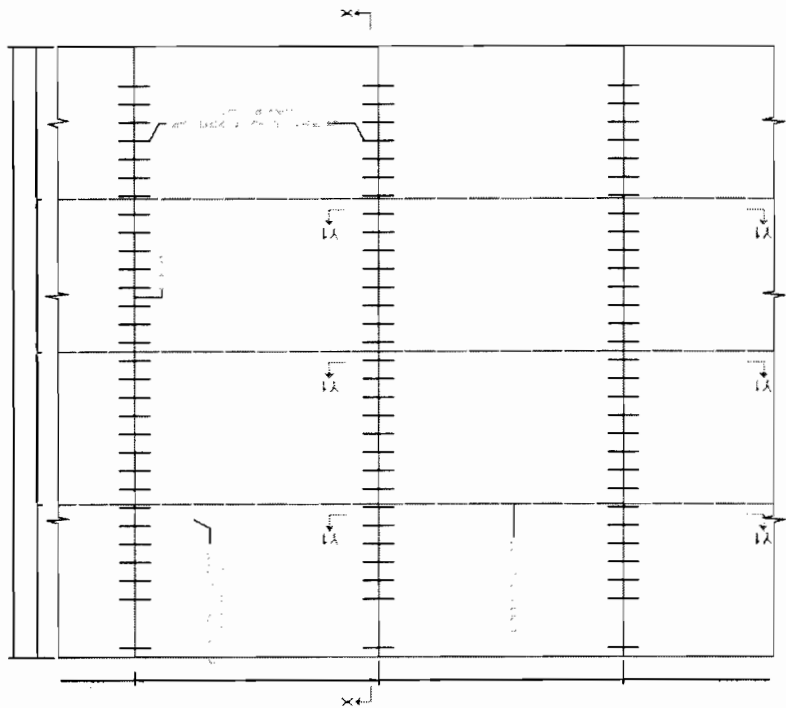
REINFORCEMENT DETAILS	QTY	UNIT
...
...
...

REINFORCEMENT DETAILS

DRG NO.	DATE	REV	REV	REV	REV	REV	REV	REV	REV
SH. NO.	14	12/12/13	R-1	R-1	R-1	R-1	R-1	R-1	R-1
SCALE	NTS			NTS			NTS		
DESIGNED BY	CBO	CHECKED BY	CBO	APPROVED BY	CE/WRP	DESIGNED BY	CE/WRP	CHECKED BY	CE/WRP

PROJECT:-
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

CONSULTING ENGINEERS GROUP LTD.
 Plot No. 12, Mohi Colony, Malviya Nagar, Jaipur-17
 Tel: +91-141-2520899, 2521899, 2520556
 Fax: 2521348, e-mail: ceg@cegindia.com

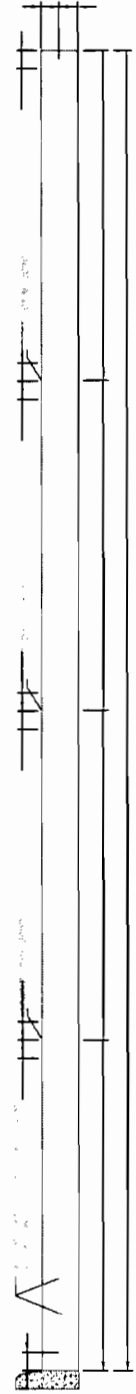


SECTION Y1-Y1 (SHOWING TIE BAR ARRANGEMENT BETWEEN CARRIAGEWAYS)

NOTATIONS

T1	Pavement Thickness
T2	D/C Thickness
S	Spacing of Dowel Bars
S1	Spacing of Tie Bars
D	Dowel Bar Dia
T	Tie Bar Dia
L1	Length of Dowel Bar
L2	Length of Tie Bar

- NOTES:**
1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE MENTIONED.
 2. THIS DRG. IS TO BE READ ALONG WITH TYPICAL CROSS SECTION FOR RIGID PAVEMENT DRG. NO. ODRP/CEG/LS/TR.
 3. FOR PAVEMENT THICKNESS AND OTHER DIMENSIONS REFER PAVEMENT SCHEDULE FOR RIGID PAVEMENT.
 4. ALL REINFORCEMENTS SHALL BE CONFIRMED TO FE-500



SECTION X-X (SHOWING DOWEL BAR ARRANGEMENT)

PROJECT:-
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

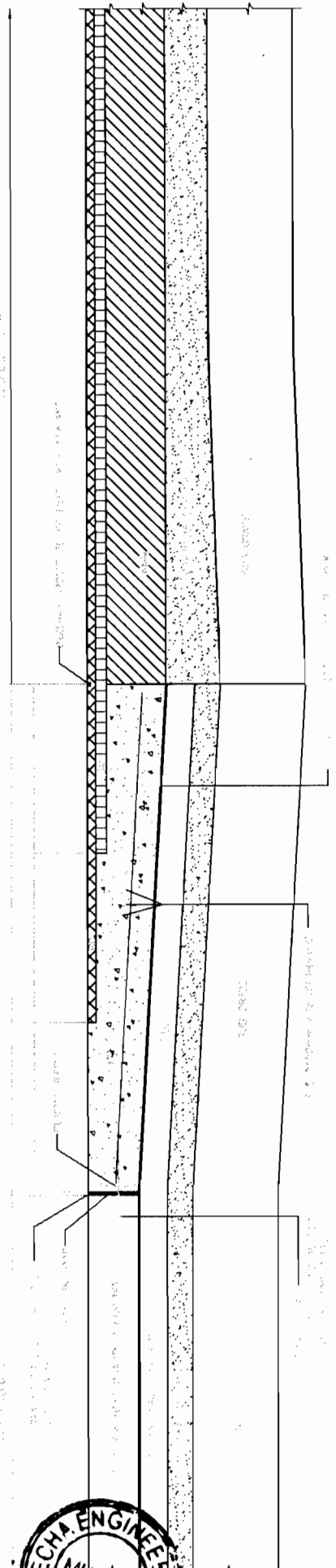
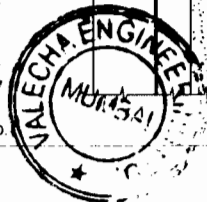
TYPICAL DETAILS OF DOWEL BAR AND TIE BAR ARRANGEMENT (JAGATPUR - DUHURIA)

DRG NO.	DESIGNED BY	APPROVED (D)
SH. NO.	DATE	REV. R-1
SCALE	NTS	PREPARED BY EE (PMU)
		CEG
		CE.WBP

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



Office: E.I.C. (Civil), Odisha
Bhubaneswar.



TYP. DETAILS OF TRANSITION SLAB BETWEEN RIGID & FLEXIBLE PAVEMENT

NOTES:

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
2. ALL MATERIALS TO BE USED AS PER SPECIFICATIONS.
3. ALL WORKMANSHIP TO BE AS PER SPECIFICATIONS.
4. ALL WORKMANSHIP TO BE AS PER SPECIFICATIONS.

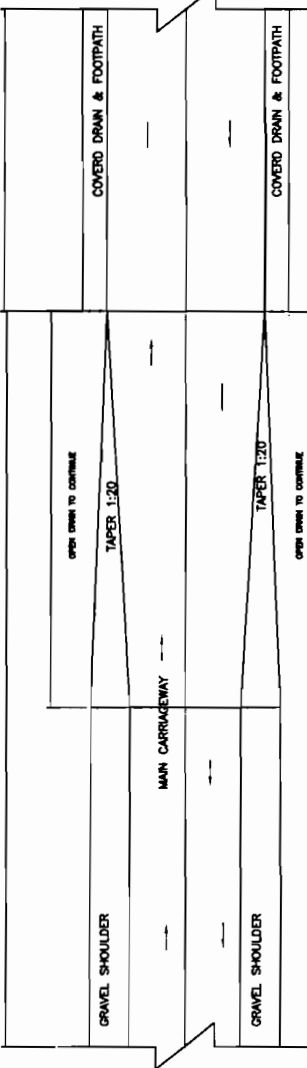
TYPICAL DETAILS OF TRANSITION SLAB
BETWEEN RIGID AND FLEXIBLE PAVEMENT
(JAGATPUR - DUHURIA)

DRG NO.	0809CEG002	DESIGNED BY	CEG	DRAWN BY	CEG	PREPARED BY	EE(PMU)	APPROVED (D)	CE,WBP
SH. NO.	12	DATE	12/12/12	REV	R-1				
SCALE		NTS							

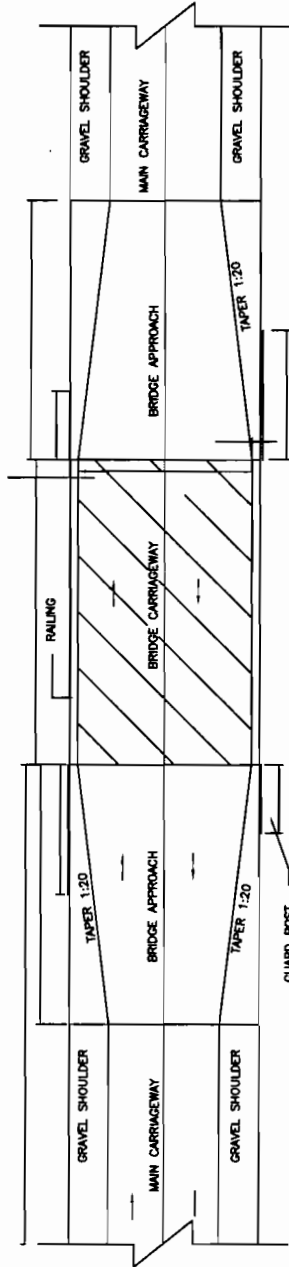
PROJECT:-
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

CONSULTING ENGINEERS GROUP LTD.
E-12, Moji Colony, Maliviya Nagar Jaipur-17
Tel: +91-141-2520899, 2521899, 2520556
Fax: 2521348, e-mail: ceg@cegroupindia.com

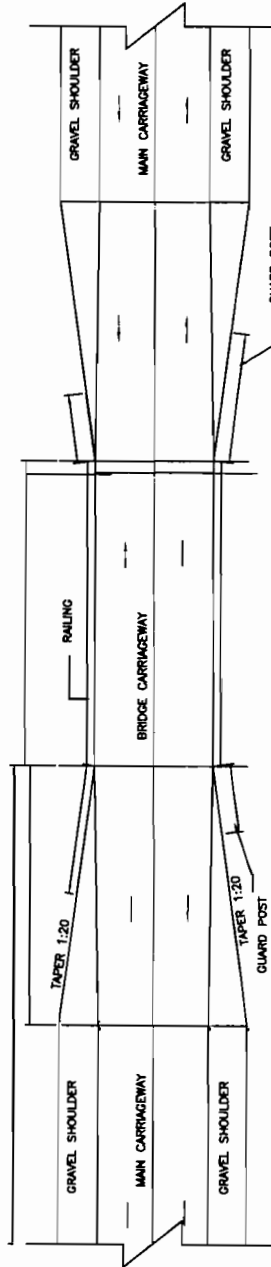




TRANSITION BETWEEN RURAL 12m SECTION TO VILLAGE 10m WITH DRAIN SECTION 10m



TRANSITION BETWEEN RURAL 12m SECTION TO BRIDGES WITH 1.1m CLEAR CARRIAGEWAY



TRANSITION BETWEEN RURAL 12m SECTION TO NARROW EXISTING BRIDGES SECTION

- NOTES**
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS INDICATED OTHERWISE.
 2. FOR DETAILS OF STRUCTURES REFER STRUCTURAL DRGS.
 3. FOR DETAILS OF BRIDGE APPROACHES REFER TYPICAL BRIDGE APPROACH DRAWING. THE MINIMUM FINISH MANAGEMENT HEIGHT IS MORE THAN 1.5 METRES AT BRIDGE APPROACHES.
 4. FOR GUARD POST DETAIL REFER DWG. NO. O/SRP/CEG/AM & GP
 5. FOR HAZARD MARKER DETAIL REFER TYPICAL ROAD SIGN & DETAILS OF ROAD DELINEATORS
 6. DRAWING TO BE READ WITH TCS- 1 TO TCS-16 AND DWG. NO. O/SRP/CEG/RGSD/02

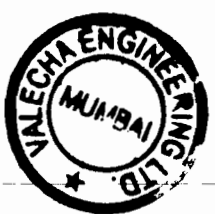
TYPICAL DETAILS OF TRANSITION OF DIFFERENT ROAD SECTION

(JAGATPUR - DUHURIA)

DRG NO.	O/SRP/CEG/AM	DESIGNED BY	CEG	APPROVED (D)	
SH. NO.	15	DATE	12/12/12	REV	R-1
SCALE	NTS		CEG	PREPARED BY	EE(PMU)
				DRAWN BY	CEG
					CE.WBP

PROJECT:-
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

CONSULTING ENGINEERS GROUP LTD.
E-12, Moji Colony, Matviya Nagar Jaipur-17
Tel: +91-141-2520899, 2521899, 2520556
Fax: 2521348, e-mail: ceg@cegindia.com

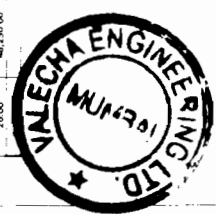


VALECHA ENGINEERING LTD.
Contractor

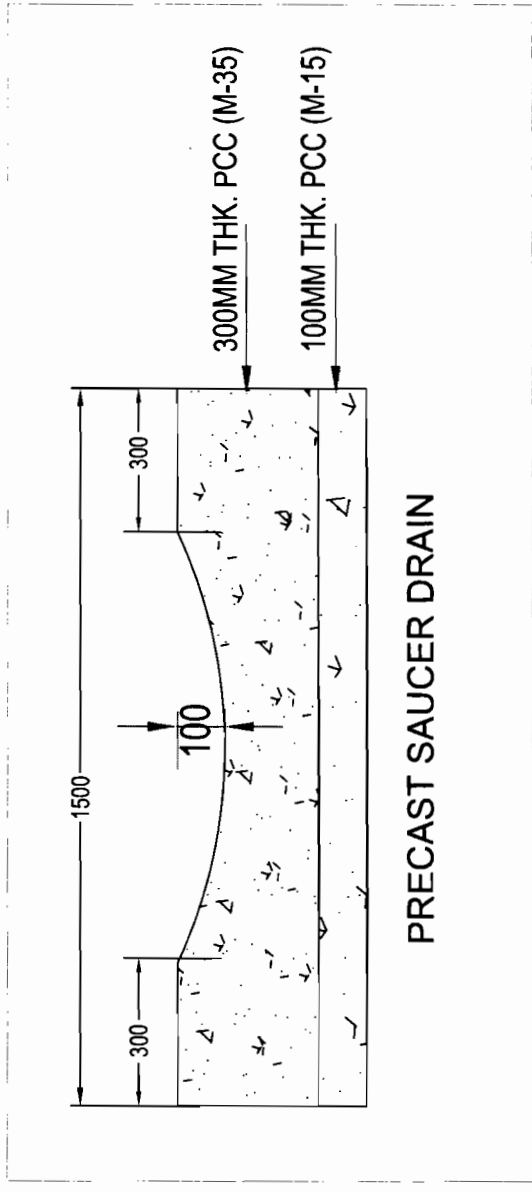
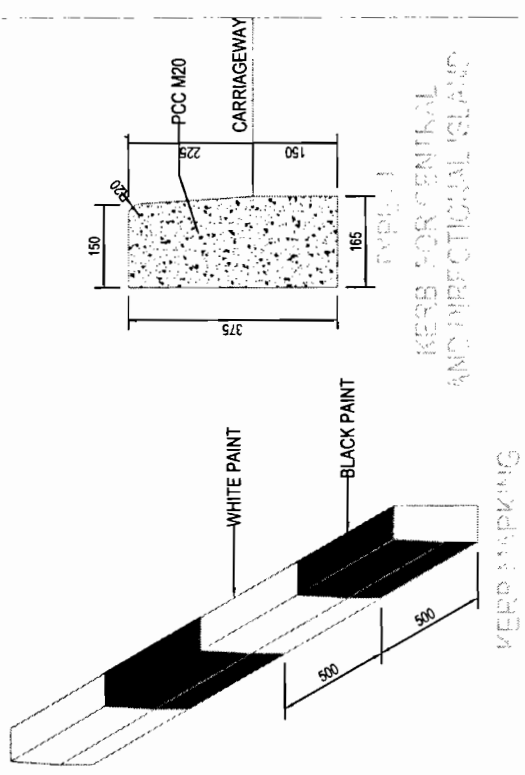
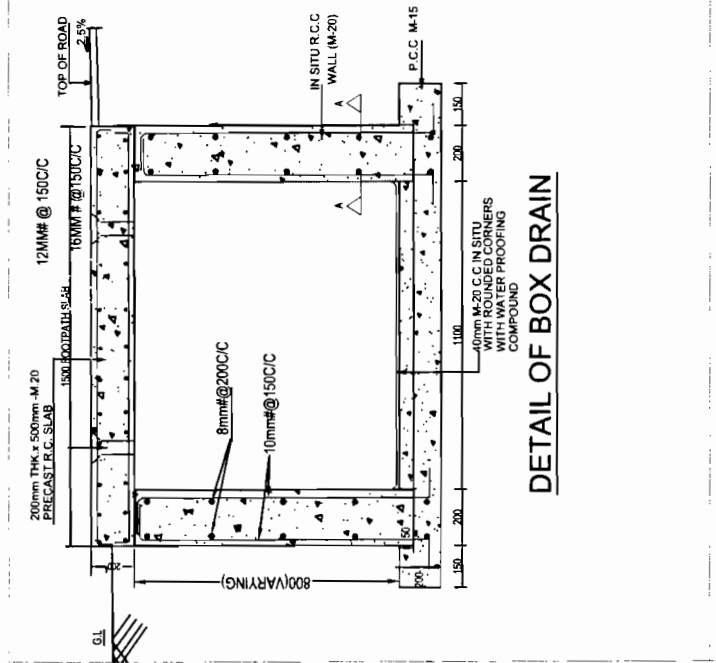
Chief Engineer,
World Bank Project, Odisha
Employer
O/o the E.I.C. (Civil), Odisha
Bhubaneswar.

Sl No	Change	From	To	TYPE OF DRAIN	SIDE	Length of SAUCER DRAIN BOX Drain
1	0.00	1,900.00	1,900.00	SAUCER	BOTH	1,900.00
2	2,200.00	2,400.00	2,400.00	SAUCER	BOTH	200.00
3	2,530.00	2,800.00	2,800.00	SAUCER	BOTH	270.00
4	3,850.00	4,300.00	4,300.00	SAUCER	BOTH	450.00
5	4,650.00	5,100.00	5,100.00	SAUCER	BOTH	450.00
6	7,550.00	7,950.00	7,950.00	SAUCER	BOTH	400.00
7	9,300.00	9,650.00	9,650.00	SAUCER	BOTH	350.00
8	10,100.00	10,480.00	10,480.00	SAUCER	BOTH	380.00
9	10,600.00	10,700.00	10,700.00	SAUCER	RIGHT	100.00
10	10,700.00	10,850.00	10,850.00	SAUCER	LEFT	150.00
11	13,800.00	14,100.00	14,100.00	SAUCER	BOTH	300.00
12	15,800.00	16,100.00	16,100.00	SAUCER	BOTH	300.00
13	17,700.00	20,800.00	20,800.00	SAUCER	BOTH	3,100.00
14	21,150.00	22,500.00	22,500.00	SAUCER	BOTH	350.00
15	24,600.00	24,250.00	24,250.00	SAUCER	BOTH	250.00
16	26,600.00	26,800.00	26,800.00	SAUCER	BOTH	200.00
17	27,550.00	28,400.00	28,400.00	SAUCER	BOTH	1,550.00
18	31,500.00	33,500.00	33,500.00	SAUCER	BOTH	2,000.00
19	35,500.00	35,500.00	35,500.00	SAUCER	BOTH	0.00
20	38,600.00	39,550.00	39,550.00	SAUCER	BOTH	950.00
21	41,400.00	41,600.00	41,600.00	SAUCER	BOTH	200.00
22	43,300.00	43,600.00	43,600.00	SAUCER	BOTH	300.00
23	44,300.00	44,800.00	44,800.00	SAUCER	BOTH	500.00
24	44,800.00	45,150.00	45,150.00	SAUCER	LEFT	350.00
25	45,150.00	45,500.00	45,500.00	SAUCER	RIGHT	350.00
26	48,250.00	48,250.00	48,250.00	SAUCER	BOTH	0.00

MALECHA ENGINEERING LTD.
Contractor



- NOTE:
- FOR DETAILS OF LINED DRAINS REFER DWG NO. OSRP/CEG/DR
 - THE PROVISION AND LENGTH OF THE LINED DRAIN SHALL BE REASSESSED DURING THE TIME OF CONSTRUCTION
 - FOOTPATH BARRIERS SHALL BE PROVIDED AS PER DWG. NO. OSRP/CEG/BB
 - FOR BARRIERS OPENING SHALL BE PROVIDED
 - LINED DRAIN SCHEDULE IS SUPERSEDED THE PLAN
 - ALL REINFORCEMENTS SHALL BE CONFIRMED TO FT-500



PROJECT:-
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

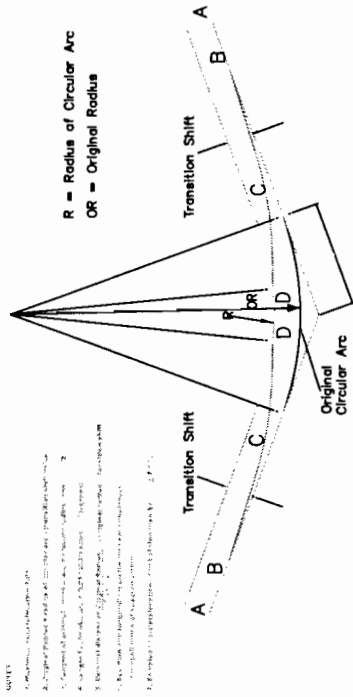
STANDARD DRAWINGS
DETAILS OF DRAIN AND KERB
(JAGATPUR - DUHURIA)

DRG NO.	OSRP/CEG/DR	DESIGNED BY	CEG	APPROVED (D)	CE/WBP
SH. NO.	16	DATE	12/12/13	REV	R-1
SCALE			NTS	PREPARED BY	EE (PMU)
			CEG	DRAWN BY	CEG

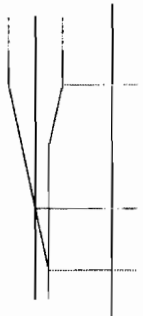
CONSULTING ENGINEERS GROUP LTD.
E-12, Moji Colony, Malviya Nagar Jaipur-17
Tel: +91-141-2520899, 2521899, 2520556
Fax: 2521348, e-mail: ceg@cegroupindia.com

CEG

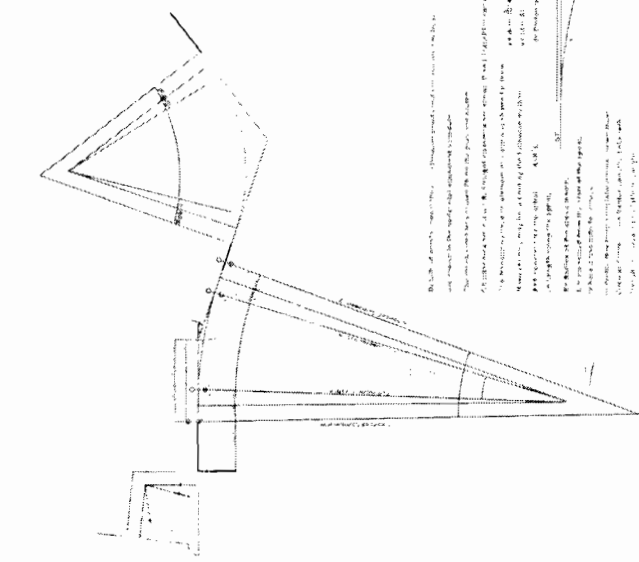
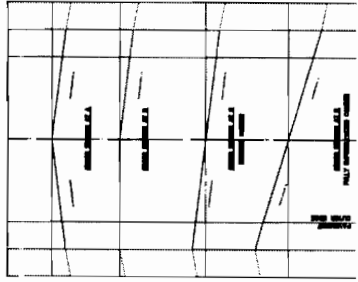
Chief Engineer,
Odisha State Road Projects, Odisha
World Bank Project Employer
O/o the E.I.C. (Civil), Odisha
Bhubaneswar.



APPLICATION OF SUPERELEVATION



LONGITUDINAL SECTION THROUGH HORIZONTAL CURVE



DETAILS OF APPLICATION OF SUPERELEVATION

PROJECT:-
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

CONSULTING ENGINEERS GROUP LTD.
E-12, Mojil Colony, Malviya Nagar Jaipur-17
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Chief Engineer,
World Bank Project, Odisha
Employer

to the E.I.C.(Civil), Odisha

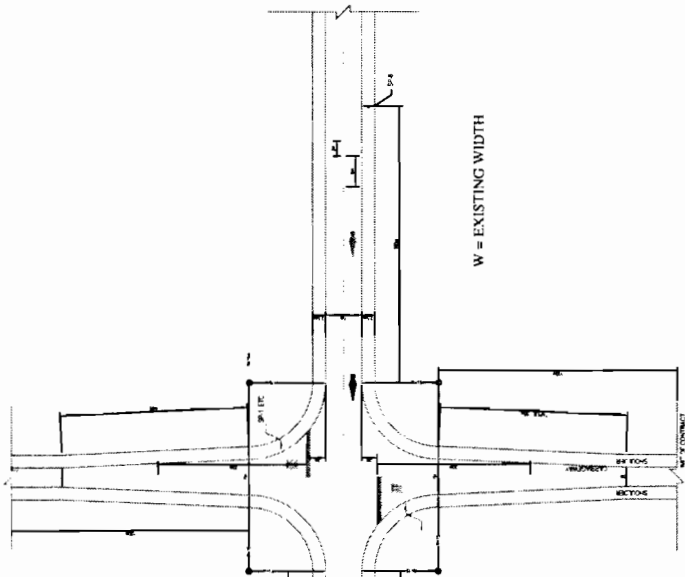
DRG NO.	OR/PC/EGRE	DESIGNED BY	REV RT	APPROVED (D)
SH. NO.	17	DATE	12/12/12	REV
SCALE			CEG	CEG
			CEG	EE(PMU)
			NTS	CE,WBP



TYPE - A, 4-LEGGED-JUNCTIONS
Sl. Chainage
No. 1 6550
2 32700

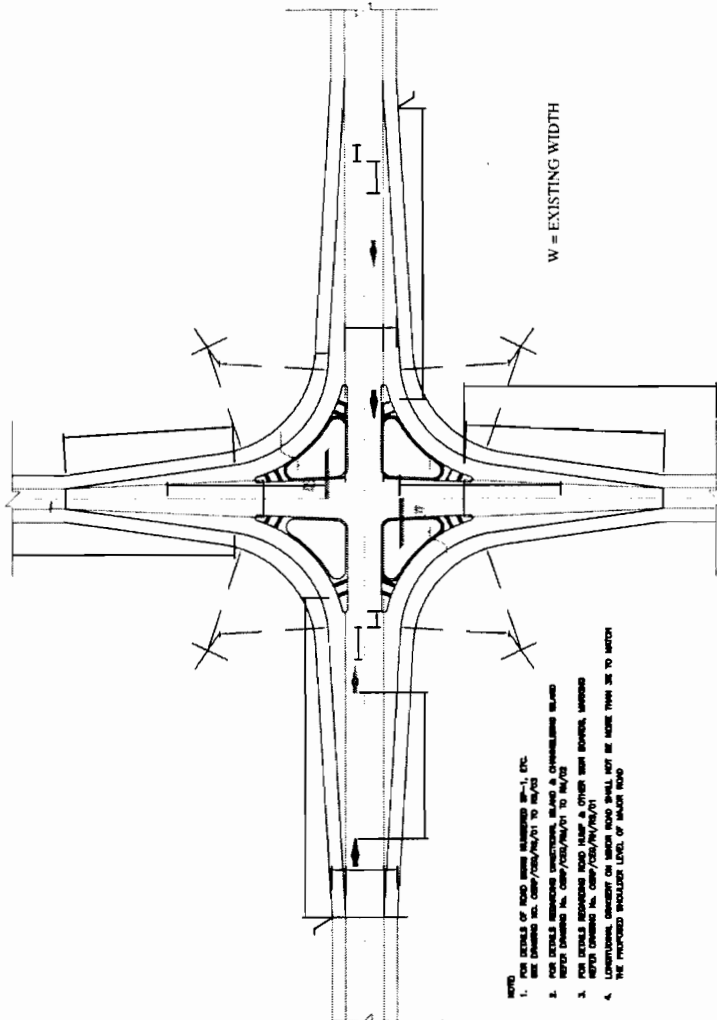
- NOTE
1. FOR DETAILS OF ROAD MARKS REFERRED TO IN 1, 2, 3, 4 AND 5 SEE DRAWING NO. CEM/7/03/PA/01 TO PA/03
 2. FOR DETAILS REFERRED TO IN 1, 2, 3, 4 AND 5 SEE DRAWING NO. CEM/7/03/PA/01 TO PA/03
 3. FOR DETAILS REFERRED TO IN 1, 2, 3, 4 AND 5 SEE DRAWING NO. CEM/7/03/PA/01 TO PA/03
 4. FOR DETAILS REFERRED TO IN 1, 2, 3, 4 AND 5 SEE DRAWING NO. CEM/7/03/PA/01 TO PA/03
 5. FOR DETAILS REFERRED TO IN 1, 2, 3, 4 AND 5 SEE DRAWING NO. CEM/7/03/PA/01 TO PA/03

W = EXISTING WIDTH



W = EXISTING WIDTH

- NOTE
1. FOR DETAILS OF ROAD MARKS REFERRED TO IN 1, 2, 3, 4 AND 5 SEE DRAWING NO. CEM/7/03/PA/01 TO PA/03
 2. FOR DETAILS REFERRED TO IN 1, 2, 3, 4 AND 5 SEE DRAWING NO. CEM/7/03/PA/01 TO PA/03
 3. FOR DETAILS REFERRED TO IN 1, 2, 3, 4 AND 5 SEE DRAWING NO. CEM/7/03/PA/01 TO PA/03
 4. FOR DETAILS REFERRED TO IN 1, 2, 3, 4 AND 5 SEE DRAWING NO. CEM/7/03/PA/01 TO PA/03
 5. FOR DETAILS REFERRED TO IN 1, 2, 3, 4 AND 5 SEE DRAWING NO. CEM/7/03/PA/01 TO PA/03



PROJECT:-
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

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Fax: 2521348; e-mail: ceg@ceindia.com



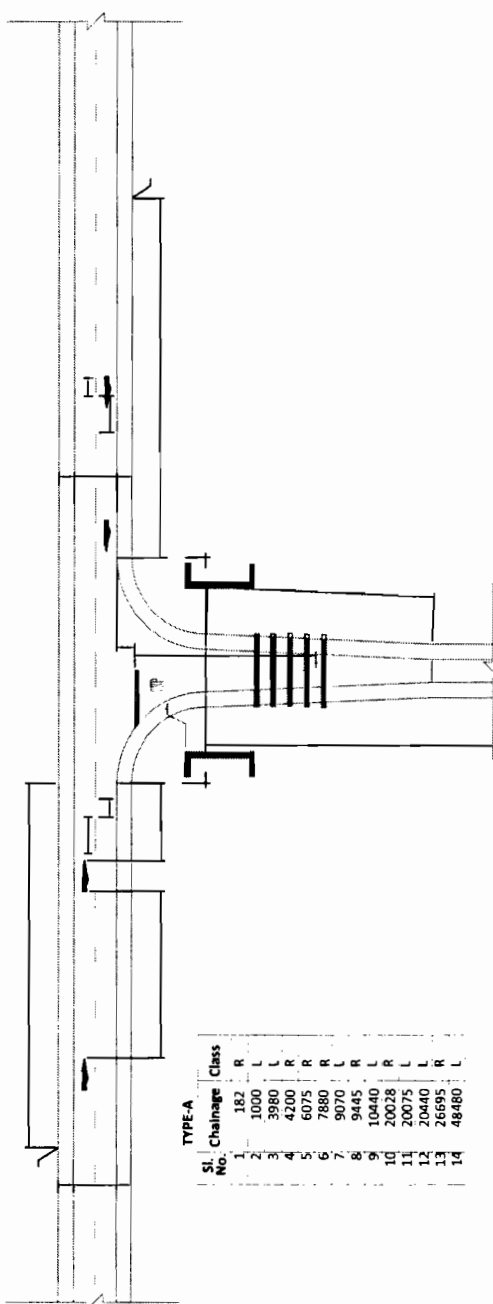
Chief Engineer,
World Bank Project,
Employer
the E.I.C. (Civil), Odisha
Bhubaneswar.

STANDARD DRAWINGS

TYPICAL 4-LEGGED INTERSECTION WITH
WITH SINGLE LANE BT ROAD
(JAGATPUR - DUHURIA)

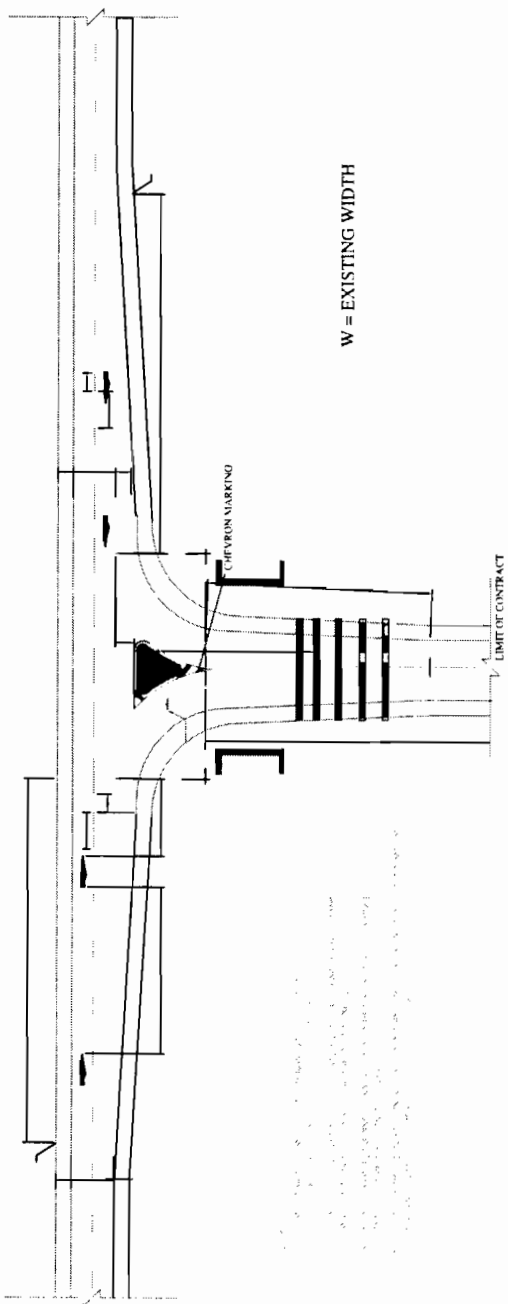
DRG NO. CEM/7/03/PA/01	DESIGNED BY	CEG	REV	R-1	DATE	12/12/12	APPROVED (D)
SH. NO. 18	DRAWN BY	CEG	REV				PREPARED BY
SCALE							EE(PMU)
							CE/WBP

NTS



TYPE - A

Sl. No.	Chainage	Class
1	187	R
2	1000	L
3	3980	L
4	4200	R
5	6075	R
6	7880	R
7	9070	L
8	9445	R
9	10440	L
10	20028	R
11	20075	L
12	20440	L
13	26695	R
14	48480	L



W = EXISTING WIDTH

Sl. No.	Chainage	Direction
1	1806	Right
2	2854	Left
3	3880	Right
4	4450	Left
5	5230	Left
6	5695	Left
7	5885	Left
8	9050	Right
9	9486	Left
10	19556	Left
11	21312	Right
12	24685	Left
13	29695	Right
14	30660	Right
15	30845	Right
16	32590	Left
17	37930	Right
18	41446	Right
19	42185	Right
20	44640	Right
21	44645	Left
22	44880	Right
23	46260	Left
24	47180	Right
25	47556	Right

PROJECT:-
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

STANDARD DRAWINGS
TYPICAL T- JUNCTION
WITH SINGLE LANE BT ROAD
(JAGATPUR - DUHURIA)

DRG NO. CSRP/CEG/02

SH. NO. 19

SCALE

DATE 12/12/12

REV R-1

NTS

DESIGNED BY CEG

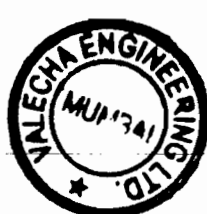
DRAWN BY CEG

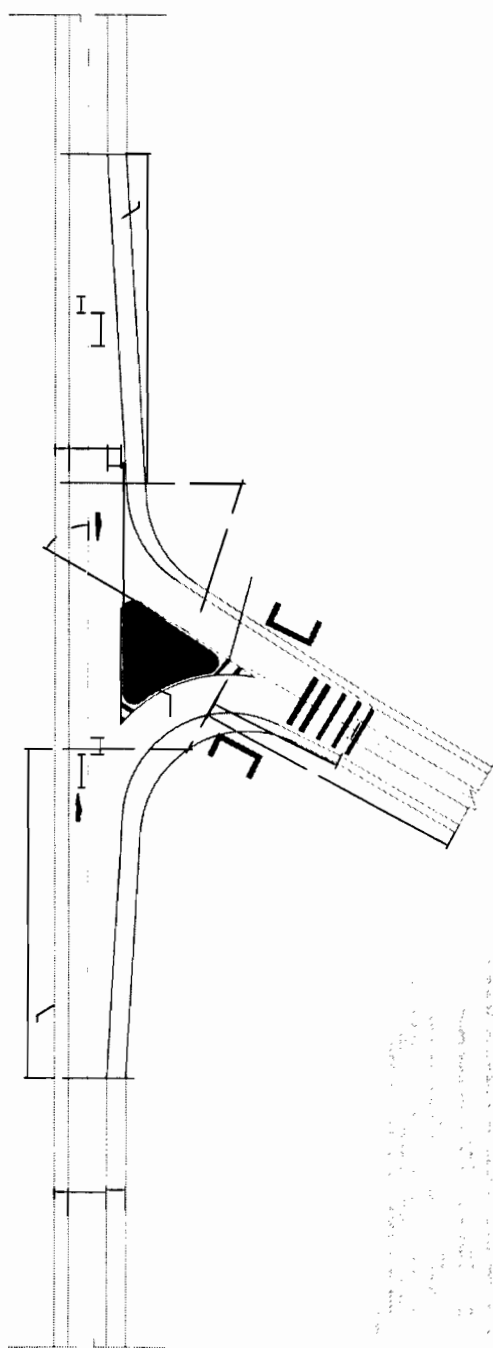
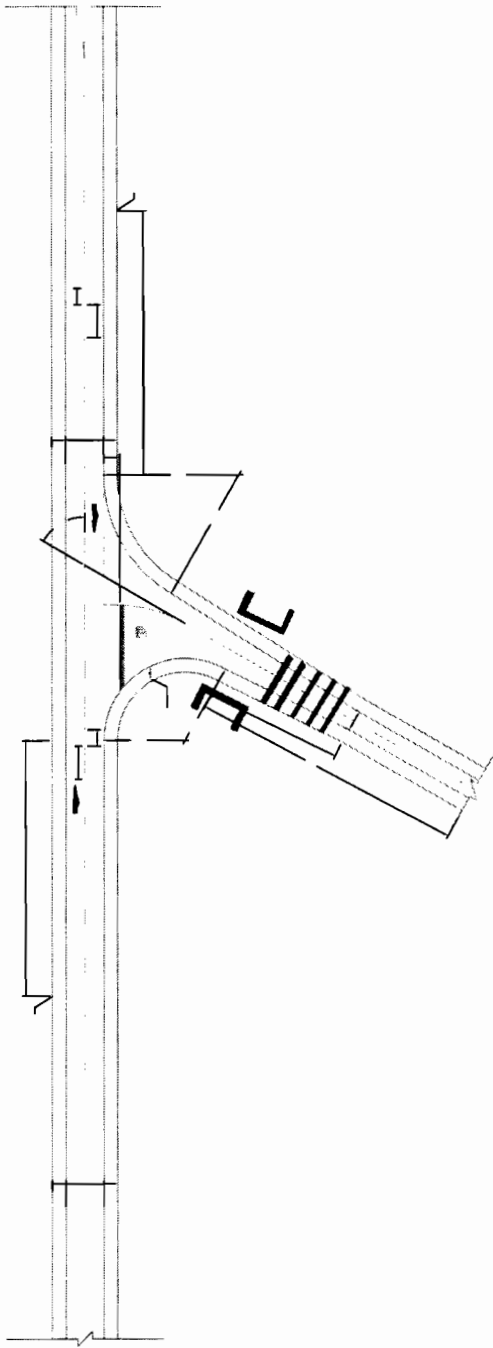
PREPARED BY EE(PMU)

APPROVED (D) CE/WBP

CONSULTING ENGINEERS GROUP LTD.
E-12, Moji Colony, Malviya Nagar Jaipur-17
Tel: +91-141-2520899, 2520556
Fax: 2521348, e-mail: ceg@cegroupindia.com

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





TYPE - A - Y-JUNCTIONS

Sl. No.	Chainage	Direction
1	510	Left
2	1183	Left
3	1366	Left
4	1405	Left
5	6105	Left
6	6315	Right
7	6800	Right
8	7640	Left
9	13896	Right
10	13904	Left
11	16650	Left
12	16891	Right
13	22400	BOTH
14	28290	Right
15	32830	Left
16	35718	Left
17	35780	Left
18	35867	Right
19	38723	Left
20	38930	Left
21	38945	Right
22	44800	Left
23	48405	Right

TYPE - B - Y-JUNCTIONS

Sl. No.	Chainage	Direction
1	2148	Left
2	2184	Left
3	3330	Left
4	4730	Left
5	5050	Left
6	10850	Right
7	10878	Left
8	13170	Left
9	13530	Left
10	15646	Left
11	18558	Right
12	18562	Right
13	19642	Right
14	19771	Left
15	21350	Left
16	21890	Left
17	24130	Right
18	24130	Right
19	24160	Right
20	24880	Right
21	26050	Left
22	26815	Left
23	26815	Left
24	28150	Left
25	28270	Right
26	28940	Right
27	29670	Right
28	31375	Left
29	33425	Left
30	33680	Right
31	34000	Left
32	35335	Right
33	36260	Right
34	36260	Right
35	36720	Left
36	37172	Left
37	37184	Right
38	38554	Left
39	39380	Right
40	41150	Right
41	41150	Right
42	42540	Right
43	44010	Right
44	45495	Left
45	45895	Right
46	47725	Right

STANDARD DRAWINGS
 TYPICAL Y-JUNCTION WITH
 SINGLE LANE BT ROAD/EARTHEN ROAD
 (JAGATPUR - DUHURIA)

PROJECT:-
 ODISHA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE

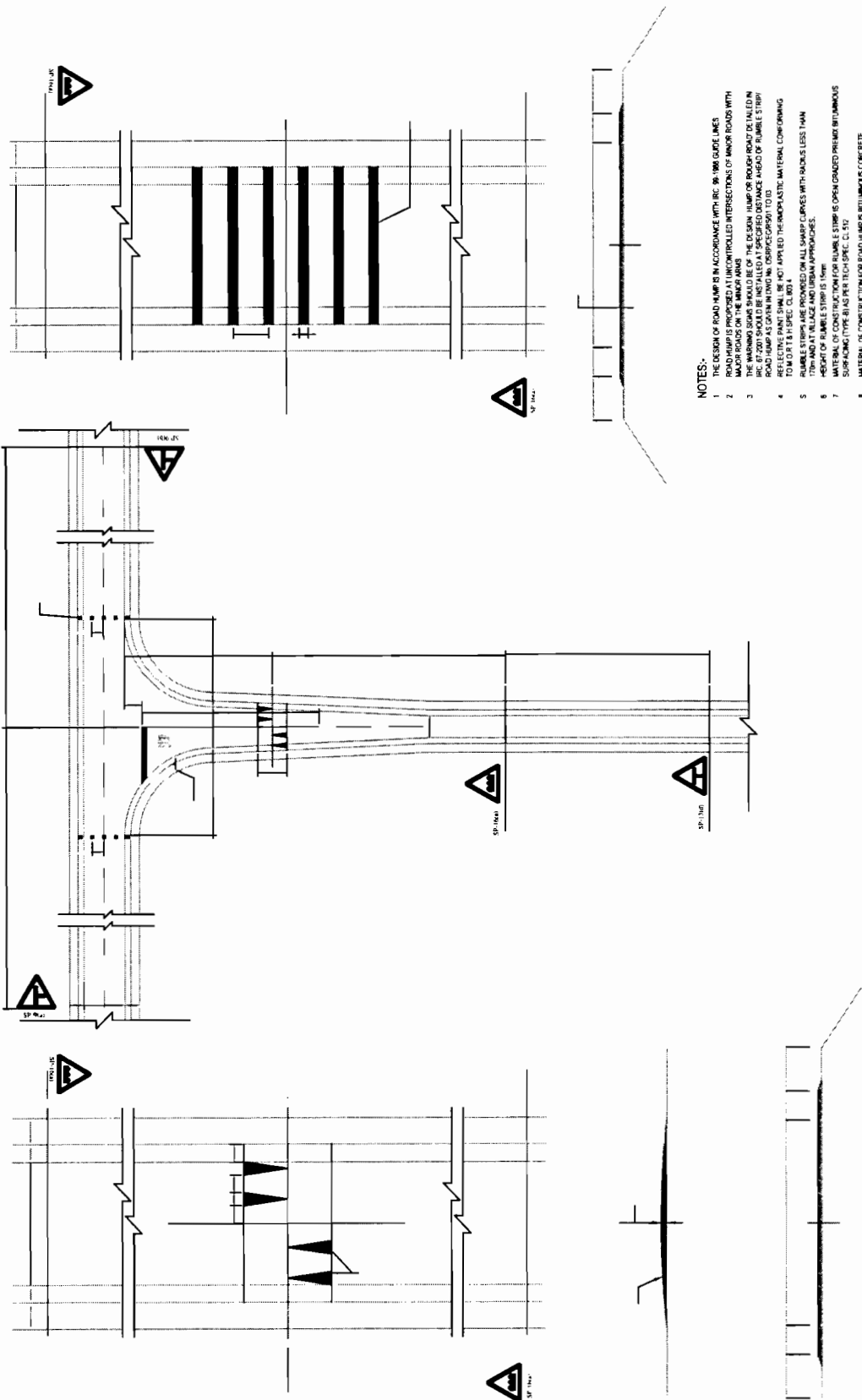
CONSULTING ENGINEERS GROUP LTD.
 E-12, Moji Colony, Malviya Nagar Jaipur-17
 Tel: +91-141-2520899, 2521899, 2520556
 Fax: 2521348, e-mail: ceg@cegroupindia.com

DRG NO.	DATE	DESIGNED BY	APPROVED (D)
SH. NO.	12/12/12	CEG	REV/01
SCALE	NTS	CEG	PREPARED BY
			EE(PMU)
			CE,WBP

VALECHA ENGINEERING LTD.
 Contractor



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



NOTES:-

- 1 THE DESIGN OF ROAD HUMPS IS IN ACCORDANCE WITH IRC - 86 (WB) GUIDE LINES.
- 2 THE DESIGN OF ROAD HUMPS AT UNCONTROLLED INTERSECTIONS OF HIGH ROADS WITH MEDIUM ROADS ON THE MAJOR ROAD.
- 3 THE WARNING SIGNS SHOULD BE OF THE DESIGN 'HUMP OR BUMP' ROAD DETAILED IN IRC 67/2001 SHOULD BE INSTALLED AT SPECIFIED DISTANCE AHEAD OF RUMBLE STRIP.
- 4 THE RUMBLE STRIP SHALL BE HOT APPLIED THERMOPLASTIC MATERIAL CONFORMING TO M.O.R.T. & H. SPEC. CL. 801.4
- 5 RUMBLE STRIPS ARE PROVIDED ON ALL SHARP CURVES WITH RADIUS LESS THAN 175M AND AT VILLAGE AND URBAN APPROACHES.
- 6 HEIGHT OF RUMBLE STRIP IS 10mm.
- 7 SURFACE TYPE SHALL BE AS PER TECH SPEC. CL. 510.
- 8 MATERIAL OF CONSTRUCTION FOR ROAD HUMP IS BITUMINOUS CONCRETE AS PER TECH SPEC. CL. 509.
- 9 REFLECTIVE PAVEMENT MARKERS ARE PROVIDED AS SHOWN IN DRAWING No. OSR/PC/CP/MA BEFORE AND AFTER RUMBLE STRIPS ROAD HUMP.

SCHEDULE AT DRG. NO. ORP/CEG/JD-49KM/SCH._RH_& RS

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@ceginodia.com



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

STANDARD DRAWINGS				DESIGNED BY	DRAWN BY	REV. R1	APPROVED (D)
DETAILS OF ROAD HUMP AND RUMBLE STRIPS				(JAGATPUR - DUJHURIA)			
SHEET 1 OF 2				CEG	CEG	CEG	EE(PMU)
DRG. NO.	OSR/PC/CP/MA	DATE	12/12/12	REV	R-1	NTS	CE/MBP
SH. NO.	22	SCALE					

SCHEDULE OF RUMBLE STRIPS

AT 4-LEGGED TYPE-A			AT T-JUNCTION TYPE-A			AT T-JUNCTION TYPE-B			AT TYPE -A - Y-JUNCTIONS			AT TYPE -B - Y-JUNCTIONS		
Sl. No.	Chainage	Direction	Sl. No.	Chainage	Direction	Sl. No.	Chainage	Direction	Sl. No.	Chainage	Direction	Sl. No.	Chainage	Direction
1	6550		1	1806	Right	1	510	Left	1	2148	Left	1	2584	Right
2	32700		2	2854	Left	2	1183	Right	2	2184	Left	2	2680	Right
			3	3880	Right	3	3880	Right	3	3330	Left	3	2780	Right
			4	4450	Left	4	4450	Left	4	4730	Left	4	2880	Right
			5	5230	Left	5	5230	Left	5	5160	Left	5	2980	Right
			6	5695	Left	6	5695	Left	6	10858	Right	6	3080	Right
			7	5885	Left	7	5885	Left	7	11278	Right	7	3180	Right
			8	9050	Right	8	9050	Right	8	13178	Left	8	3280	Right
			9	9486	Left	9	9486	Left	9	13530	Left	9	3380	Right
			10	19556	Left	10	19556	Left	10	15646	Left	10	3480	Right
			11	21312	Right	11	21312	Right	11	18658	Left	11	3580	Right
			12	24685	Left	12	24685	Left	12	18817	Right	12	3680	Right
			13	29695	Right	13	29695	Right	13	19642	Right	13	3780	Right
			14	30660	Right	14	30660	Right	14	19771	Left	14	3880	Right
			15	30845	Right	15	30845	Right	15	21350	Left	15	3980	Right
			16	32590	Left	16	32590	Left	16	21890	Left	16	4080	Right
			17	37930	Right	17	37930	Right	17	24120	Right	17	4180	Right
			18	41446	Right	18	41446	Right	18	24430	Left	18	4280	Right
			19	42185	Right	19	42185	Right	19	24680	Right	19	4380	Right
			20	44640	Left	20	44640	Left	20	26880	Right	20	4480	Right
			21	44645	Left	21	44645	Left	21	26885	Left	21	4580	Right
			22	44880	Right	22	44880	Right	22	27885	Left	22	4680	Right
			23	46260	Left	23	46260	Left	23	27980	Left	23	4780	Right
			24	47180	Right	24	47180	Right	24	28160	Right	24	4880	Right
			25	47556	Right	25	47556	Right	25	28270	Right	25	4980	Right

Sl. No.	Location	Remarks
1	4156	SCHOOL
2	4349	SCHOOL
3	4484	SCHOOL
4	5411	SCHOOL
5	5715	SCHOOL
6	10297.5	SCHOOL
7	18773	SCHOOL
8	19578	SCHOOL
9	36973	SCHOOL
10	50365	SCHOOL
11	57347.5	SCHOOL
12	58421	SCHOOL
13	58443	SCHOOL
14	63008.5	SCHOOL
15	72254	SCHOOL
16	74913	SCHOOL
17	95950	SCHOOL
18	102718.5	SCHOOL
19	102772.5	SCHOOL
20	104306.5	SCHOOL
21	2327.5	HOSPITAL
22	18147.5	HOSPITAL
23	19534.5	HOSPITAL
24	19611	HOSPITAL
25	20077	HOSPITAL
26	24041	HOSPITAL
27	26648	HOSPITAL
28	26734	HOSPITAL
29	27446	HOSPITAL
30	35622	HOSPITAL
31	48062	HOSPITAL

VALECHA ENGINEERING LTD.
Contractor



SCHEDULE OF HUMPS & RUMBLERS

DWG NO.	OSRP/CEG/SCH/RI&RS	DESIGNED BY	CEG	DRAWN BY	CEG	PREPARED BY	EE, PMU	APPROVED	CE, WBP
SIL NO.	167	DATE	12/12/12	REV	R-1	SCALE	NTS		

CEG CONSULTING ENGINEERS GROUP LTD.
E-12, Moj Colony, Malviya Nagar, Jaipur-17
Tel: +91-141-2520899, 2520556
Fax: 2521348, e-mail: ceg@ceginfolia.com

CLIENT :-
**WORKS DEPARTMENT
GOVT. OF ODISHA**

PROJECT :-
**ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE**

Engineer,
Odisha
World Bank Project
Bhubaneswar

CLASS-B, GI 40 MM DIA PIPE

GI 30 MM DIA PIPE

BASE PLATE 150MM

150

ELEVATION OF FOOTPATH BARRIER

VALECHA ENGINEERING LTD
Contractor



SCHEDULE OF FOOTPATH BARRIER (BOTH SIDES)

Sl. No.	From	To
25	47,950.00	48,250.00
26	48,250.00	48,950.00
27	49,100.00	49,200.00

Sl. No.	From	To
1	0.00	1,900.00
2	2,200.00	2,400.00
3	2,500.00	2,800.00
4	3,650.00	4,300.00
5	5,800.00	7,200.00
6	7,550.00	7,950.00
7	9,300.00	9,660.00
8	10,100.00	10,480.00
9	10,700.00	10,700.00
10	10,700.00	10,850.00
11	13,800.00	14,000.00
12	16,600.00	17,100.00
13	17,700.00	20,800.00
14	22,150.00	22,500.00
15	24,000.00	24,250.00
16	26,600.00	26,800.00
17	27,250.00	28,400.00
18	32,650.00	33,200.00
19	35,250.00	35,900.00
20	38,600.00	39,550.00
21	41,400.00	41,600.00
22	43,300.00	43,600.00
23	44,300.00	44,800.00
24	44,800.00	45,150.00

NOTE: OPENING SHALL BE PROVIDED FOR ENTRY TO PROPERTIES & SIDE ROADS.

PROJECT:-

ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

**STANDARD DRAWINGS
DETAILS OF FOOTPATH BARRIERS**

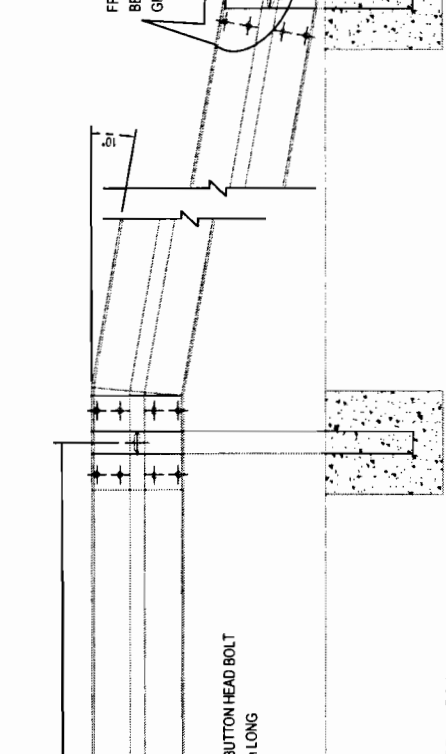
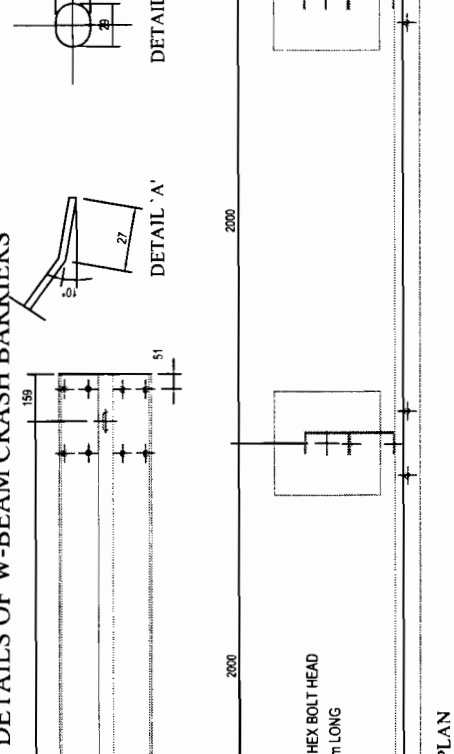
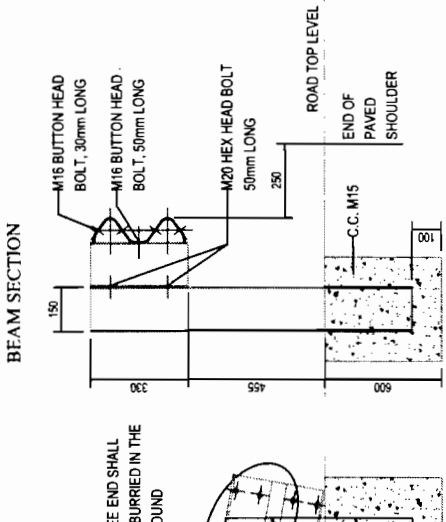
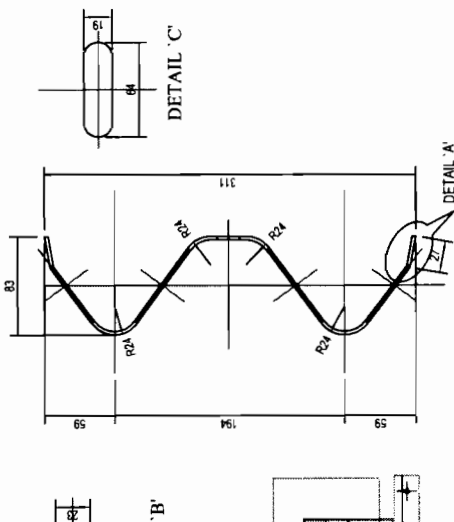
(JAGATPUR - DUHURIA)

DRG NO. 058PCEGPR	DESIGNED BY	DRAWN BY	REV./A	APPROVED (D)
SH. NO. 23	DATE 12/12/12	REV R-1	CEG	PREPARED BY EE(PMU)
SCALE	NTS			CEG

CEG CONSULTING ENGINEERS 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,
Work and Power Project,
in the E.C.C. (Civil), Odisha
Bhubaneswar.

DETAILS OF W-BEAM CRASH BARRIERS



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 550g/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 (600mm WIDE) OF BLACK & YELLOW COLOR REFLECTORISED PAINT CONFORMING CL.603.5 OF M.O.R.T & H SPEC.

SCHEDULE:
 1. HEIGHT OF POSTS SHOULD BE 765mm 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, 765mm 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.

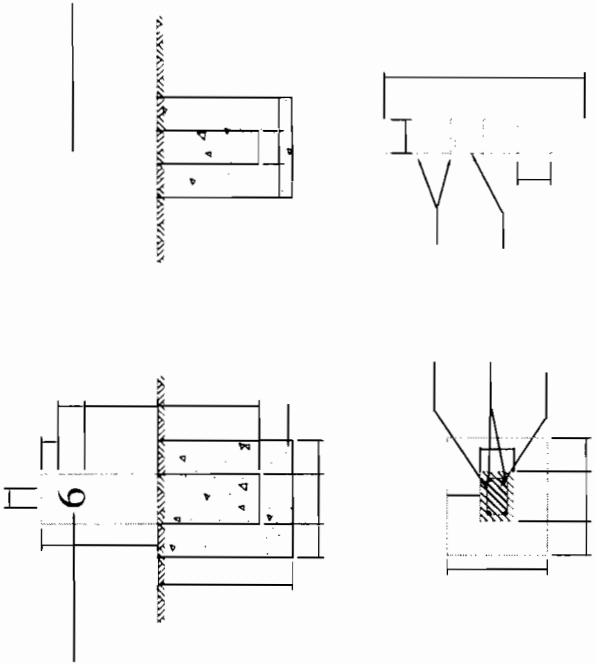
STANDARD DRAWINGS
METAL BEAM CRASH BARRIER DETAILS
(JAGATPUR -DUHURIA)

DRG NO.	OSRR/CEG/DB	DESIGNED BY	CEG	DRAWN BY	CEG	REV	R-1	APPROVED (D)	EE(WBP)
SH. NO.	24	DATE	12/12/12	REV	R-1	PREPARED BY	EE(PMU)		
SCALE	NTS								

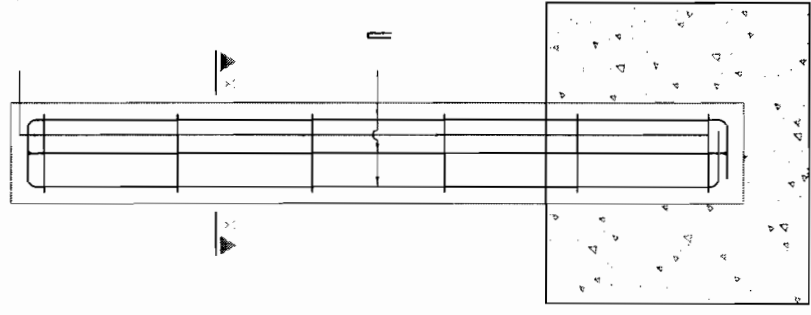
PROJECT:-
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

CONSULTING ENGINEERS GROUP LTD.
 E-12, Moji Colony, Malviya Nagar, Jaipur-17
 Tel: +91-141-2520899, 2521899, 2520556
 Fax: 2521348, e-mail: ceg@cegroupindia.com

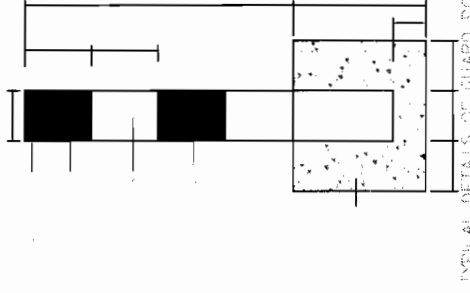




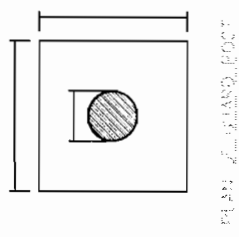
FIXING DETAILS OF GUARD POST



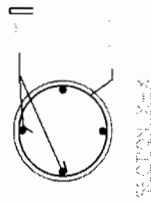
REINFORCEMENT DETAIL OF GUARD POST



TYPICAL DETAILS OF GUARD POST



PLAN OF GUARD POST



SECTION 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

CONSULTING ENGINEERS GROUP LTD.
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Tel: +91-141-2520899, 2521899, 2520556
Fax: 2521348, e-mail: ceg@cegroupindia.com

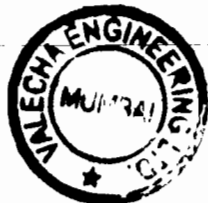


Chartered Engineer
World Bank Projects Consultant
E. T. C. Group Odisha
Rhubaneswar.

PROJECT:-
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

STANDARD DRAWINGS
TYPICAL DETAILS OF 200M STONE & GUARD POST
(JAGATPUR - DUHURIA)

DRG NO.	OSRP/CEG/SH9A & GP	DESIGNED BY	CEG	DRAWN BY	CEG	REV. #1	APPROVED (D):
SH. NO.	26	DATE	12/12/12	REV	R-1	PREPARED BY	EE(PMU)
SCALE	NTS						CE WBP



SCHEDULE OF GUARD POSTS

Sl.No.	LEFT SIDE		Distance
	From	To	
1	4950	5100	150
2	11950	12300	350
3	12350	12385	35
4	12580	12600	20
5	12700	12750	50
6	14700	14800	100
7	22800	22830	30
8	47050	47100	50

SCHEDULE OF GUARD POSTS

Sl.No.	RIGHT SIDE		Distance
	From	To	
1	5050	5130	80
2	8300	8450	150
3	8600	8650	50
4	12150	12415	265
5	14600	14750	150
6	21400	21485	85
7	42860	42890	30
8	42950	43000	50
9	45450	45475	25

CLIENT :-
WORKS DEPARTMENT
GOVT. OF ODISHA

CEG CONSULTING ENGINEERS GROUP LTD.
E-12, Meji Colony, Malviya Nagar, Jaipur-17
Tel: +91-141-2520899, 2521899, 2520556
Fax: 2521348, e-mail: ceg@cegindia.com

SCHEDULE OF GUARD POSTS

DRG. NO.	OSRP/CEG/JD-40KM/SCH-GP	DATE	12/12/12	RFV	R-1	DESIGN DIV	CEG	DRAWN BY	CEG	PREPARED BY	EE, PMU	APPROVED	CE, WBP
Sl. No.	165	SCALE: NTS											

PROJECT :-
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

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

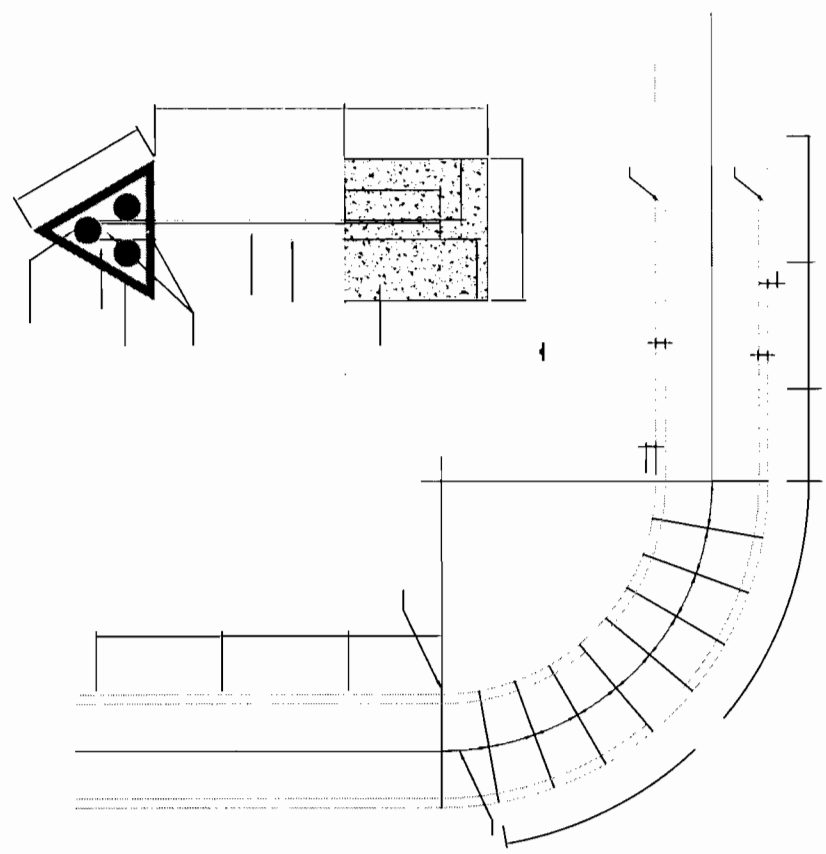
SCHEDULE OF DELINEATORS

Curve No.	Curve Start	Curve End	Radius	Spacing	Outer Side	Inner Side	Total
1	818.949	1860.641	200	20	7	4	9
2	95.629	2013.961	100	12	4	4	8
3	252.163	2171.345	100	12	4	4	8
4	514.327	2328.729	200	20	5	4	9
5	776.491	2486.113	200	20	5	4	9
6	1038.655	2643.497	300	20	5	4	9
7	1300.819	2800.881	300	20	5	4	9
8	1562.983	2958.265	300	20	5	4	9
9	1825.147	3115.649	300	20	5	4	9
10	2087.311	3273.033	300	20	5	4	9
11	2349.475	3430.417	300	20	5	4	9
12	2611.639	3587.801	300	20	5	4	9
13	2873.803	3745.185	300	20	5	4	9
14	3135.967	3902.569	300	20	5	4	9
15	3398.131	4059.953	300	20	5	4	9
16	3660.295	4217.337	300	20	5	4	9
17	3922.459	4374.721	300	20	5	4	9
18	4184.623	4532.105	300	20	5	4	9
19	4446.787	4689.489	300	20	5	4	9
20	4708.951	4846.873	300	20	5	4	9
21	4971.115	5004.257	300	20	5	4	9
22	5233.279	5161.641	300	20	5	4	9
23	5495.443	5319.025	300	20	5	4	9
24	5757.607	5476.409	300	20	5	4	9
25	6019.771	5633.793	300	20	5	4	9
26	6281.935	5791.177	300	20	5	4	9
27	6544.099	5948.561	300	20	5	4	9
28	6806.263	6105.945	300	20	5	4	9
29	7068.427	6263.329	300	20	5	4	9
30	7330.591	6420.713	300	20	5	4	9
31	7592.755	6578.097	300	20	5	4	9
32	7854.919	6735.481	300	20	5	4	9
33	8117.083	6892.865	300	20	5	4	9
34	8379.247	7050.249	300	20	5	4	9
35	8641.411	7207.633	300	20	5	4	9
36	8903.575	7365.017	300	20	5	4	9
37	9165.739	7522.401	300	20	5	4	9
38	9427.903	7679.785	300	20	5	4	9
39	9690.067	7837.169	300	20	5	4	9
40	9952.231	7994.553	300	20	5	4	9
41	10214.395	8151.937	300	20	5	4	9
42	10476.559	8309.321	300	20	5	4	9
43	10738.723	8466.705	300	20	5	4	9
44	11000.887	8624.089	300	20	5	4	9
45	11263.051	8781.473	300	20	5	4	9
46	11525.215	8938.857	300	20	5	4	9
47	11787.379	9096.241	300	20	5	4	9
48	12049.543	9253.625	300	20	5	4	9
49	12311.707	9411.009	300	20	5	4	9
50	12573.871	9568.393	300	20	5	4	9
51	12836.035	9725.777	300	20	5	4	9
52	13098.199	9883.161	300	20	5	4	9
53	13360.363	10040.545	300	20	5	4	9
54	13622.527	10197.929	300	20	5	4	9
55	13884.691	10355.313	300	20	5	4	9
56	14146.855	10512.697	300	20	5	4	9
57	14409.019	10670.081	300	20	5	4	9
58	14671.183	10827.465	300	20	5	4	9
59	14933.347	10984.849	300	20	5	4	9
60	15195.511	11142.233	300	20	5	4	9
61	15457.675	11299.617	300	20	5	4	9
62	15719.839	11456.999	300	20	5	4	9
63	15982.003	11614.383	300	20	5	4	9
64	16244.167	11771.767	300	20	5	4	9
65	16506.331	11929.151	300	20	5	4	9
66	16768.495	12086.535	300	20	5	4	9
67	17030.659	12243.919	300	20	5	4	9
68	17292.823	12401.303	300	20	5	4	9
69	17554.987	12558.687	300	20	5	4	9
70	17817.151	12716.071	300	20	5	4	9
71	18079.315	12873.455	300	20	5	4	9
72	18341.479	13030.839	300	20	5	4	9
73	18603.643	13188.223	300	20	5	4	9
74	18865.807	13345.607	300	20	5	4	9
75	19127.971	13502.991	300	20	5	4	9
76	19390.135	13660.375	300	20	5	4	9
77	19652.299	13817.759	300	20	5	4	9
78	19914.463	13975.143	300	20	5	4	9
79	20176.627	14132.527	300	20	5	4	9
80	20438.791	14289.911	300	20	5	4	9
81	20700.955	14447.295	300	20	5	4	9
82	20963.119	14604.679	300	20	5	4	9
83	21225.283	14762.063	300	20	5	4	9
84	21487.447	14919.447	300	20	5	4	9
85	21749.611	15076.831	300	20	5	4	9
86	22011.775	15234.215	300	20	5	4	9
87	22273.939	15391.599	300	20	5	4	9
88	22536.103	15548.983	300	20	5	4	9
89	22798.267	15706.367	300	20	5	4	9
90	23060.431	15863.751	300	20	5	4	9
91	23322.595	16021.135	300	20	5	4	9
92	23584.759	16178.519	300	20	5	4	9
93	23846.923	16335.903	300	20	5	4	9
94	24109.087	16493.287	300	20	5	4	9
95	24371.251	16650.671	300	20	5	4	9
96	24633.415	16808.055	300	20	5	4	9
97	24895.579	16965.439	300	20	5	4	9
98	25157.743	17122.823	300	20	5	4	9
99	25419.907	17280.207	300	20	5	4	9
100	25682.071	17437.591	300	20	5	4	9

VALECHA ENGINEERING LTD
Contractor



NOTE:
1. FOR THE TAILS OF ROAD DELINEATORS REFER DRAWING NO. ISE/CEG/RD
2. ROAD DELINEATORS SHALL BE PROVIDED AS PER THE GUIDELINES IN IRC 76:1981



S/L No.	RADIUS OF CURVE (METRES)	SPACING ON CURVES (METRES)
1	30	6
2	50	8
3	100	12
4	200	20
5	300	25
6	400	30
7	500	35
8	600	38
9	700	42
10	800	45
11	900	48
12	1000	50

- NOTES:
1. DELINEATORS ARE TO BE PROVIDED AS PER THE SCHEDULE OF DELINEATORS.
 2. ALL DELINEATORS TO BE PROVIDED AS PER THE SCHEDULE OF DELINEATORS AT THE END OF THE CURVE.
 3. INSTALL DELINEATORS AT EQUAL SPACING WITHIN THE CURVE.
 4. SEE TABLE FOR VALUES OF 'S' & 'R'.
 5. DELINEATORS SHALL BE PROVIDED AS PER THE SCHEDULE OF DELINEATORS.
 6. DELINEATORS SHALL BE PROVIDED AS PER THE SCHEDULE OF DELINEATORS.
 7. DELINEATORS SHALL BE PROVIDED AS PER THE SCHEDULE OF DELINEATORS.
 8. DELINEATORS SHALL BE PROVIDED AS PER THE SCHEDULE OF DELINEATORS.
 9. DELINEATORS SHALL BE PROVIDED AS PER THE SCHEDULE OF DELINEATORS.
 10. DELINEATORS SHALL BE PROVIDED AS PER THE SCHEDULE OF DELINEATORS.
 11. DELINEATORS SHALL BE PROVIDED AS PER THE SCHEDULE OF DELINEATORS.
 12. DELINEATORS SHALL BE PROVIDED AS PER THE SCHEDULE OF DELINEATORS.
 13. DELINEATORS SHALL BE PROVIDED AS PER THE SCHEDULE OF DELINEATORS.

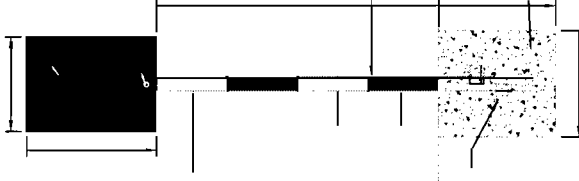
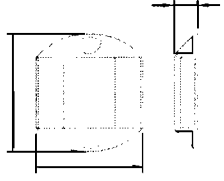
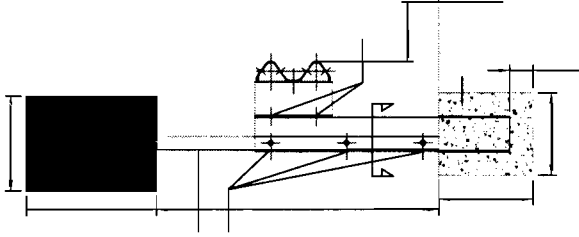
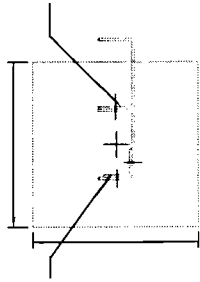
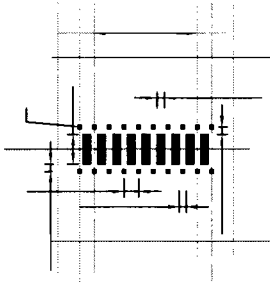
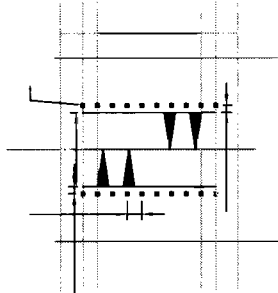
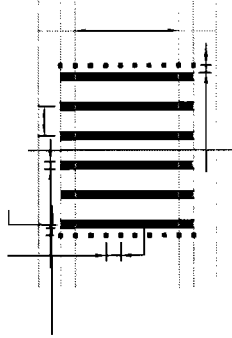
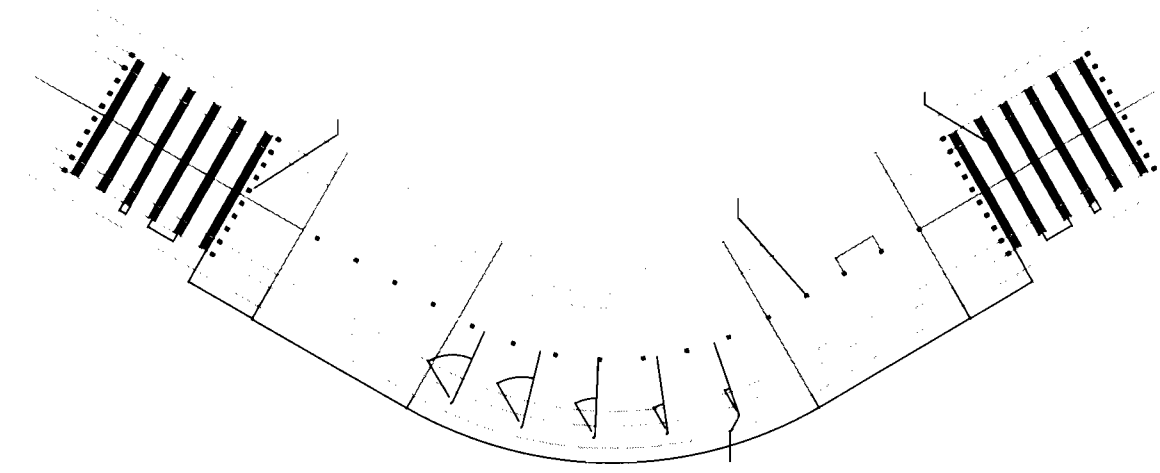
PROJECT:-
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

CEG 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
DETAILS OF ROAD DELINEATORS
(JAGATPUR - DUHURIA)

DRG NO. ISE/CEG/RD	DESIGNED BY	CEG	DRAWN BY	REV1	APPROVED (D)
SH. NO.	DATE	12/12/12	REV	R-1	PREPARED BY
SCALE	NTS		CEG	CEG	EEIPMU
					CE.WBP

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



VALECHA ENGINEERING LTD.
Contractor



STANDARD DRAWINGS		APPROVED/DI	
DETAILS OF RRPMS MARKERS(Sheet 1 of 2)		REVISIT	
(JAGATPUR - DUHURIA)		DRAWN BY	
DRG NO.	DATE	DESIGNED BY	CEG
SH. NO.	28	12/12/12	REV R-1
SCALE		NTS	
		PREPARED BY	EE(PMU)
		CEG	CE.WBP

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@cegroupindia.com

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

SCHEDULE OF BUILTUP AREAS

Sl. No.	From	To	Length
1.00	0.00	1,900.00	1,900.00
2.00	2,200.00	2,400.00	200.00
3.00	2,530.00	2,800.00	270.00
4.00	3,850.00	4,300.00	450.00
5.00	5,800.00	7,200.00	1,400.00
6.00	7,550.00	7,950.00	400.00
7.00	9,300.00	9,660.00	360.00
8.00	10,100.00	10,480.00	380.00
9.00	10,600.00	10,700.00	100.00
10.00	10,700.00	10,850.00	150.00
11.00	13,800.00	14,000.00	200.00
12.00	16,600.00	17,100.00	500.00
13.00	17,700.00	20,800.00	3,100.00
14.00	22,150.00	22,500.00	350.00
15.00	24,000.00	24,250.00	250.00
16.00	26,600.00	26,800.00	200.00
17.00	27,250.00	28,400.00	1,150.00
18.00	32,650.00	33,200.00	550.00
19.00	35,250.00	35,900.00	650.00
20.00	38,600.00	39,550.00	950.00
21.00	41,400.00	41,600.00	200.00
22.00	43,300.00	43,600.00	300.00
23.00	44,300.00	44,800.00	500.00
24.00	44,800.00	45,150.00	350.00
25.00	47,950.00	48,250.00	300.00
26.00	48,250.00	48,950.00	700.00

SCHEDULE OF RRPMs ALONG SHARP CURVES

Sl. No.	Loc. No.	Length	Sl. No.	Loc. No.	Length
1	1818	110	7	53300	170
2	1960	140	8	56670	150
3	2150	170	9	56500	150
4	2270	120	10	62975	150
5	37950	160	11	72375	150
6	48115	150	12	84410	110

SCHEDULE OF MINOR JUNCTIONS FOR RRPMS

TYPE - A - 4 LEGGED JUNCTIONS

Sl. No.	Chainage
1	6550
2	32700

TYPE - A - 3 JUNCTIONS

Sl. No.	Chainage	Class
1	182	R
2	1000	L
3	3980	L
4	4200	R
5	6075	R
6	7880	R
7	9070	L
8	9440	R
9	10440	R
10	20028	R
11	20075	L
12	21695	R
13	21695	R
14	48380	L

TYPE - B - T JUNCTIONS

Sl. No.	Chainage	Direction
1	1805	Right
2	2854	Left
3	3880	Right
4	4450	Left
5	5230	Left
6	6075	Left
7	6075	Left
8	9050	Right
9	9480	Left
10	19555	Left
11	21312	Right
12	24685	Left
13	29695	Right
14	30845	Right
15	30845	Right
16	32590	Left
17	37930	Right
18	41446	Right
19	42185	Right
20	44640	Right
21	44645	Left
22	44880	Right
23	46260	Left
24	47180	Right

TYPE - A - Y JUNCTIONS

Sl. No.	Chainage	Direction
1	510	Left
2	1183	Left
3	1366	Left
4	1405	Left
5	6105	Left
6	6315	Left
7	6800	Right
8	7640	Left
9	13896	Right
10	13904	Left
11	16650	Left
12	16891	Right
13	22400	ROTH
14	28290	Right
15	32830	Left
16	35718	Left
17	35780	Left
18	35867	Right
19	38723	Left
20	38930	Left
21	38945	Right
22	44800	Left
23	48405	Right

TYPE - B - Y JUNCTIONS

Sl. No.	Chainage	Direction
1	2148	Left
2	3190	Left
3	4730	Left
4	10858	Right
5	10878	Left
6	13120	Left
7	15446	Left
8	18658	Left
9	18817	Right
10	19721	Left
11	21350	Left
12	21890	Left
13	24120	Right
14	24880	Right
15	24880	Right
16	26950	Left
17	27980	Left
18	28160	Left
19	28270	Right
20	28270	Right
21	28270	Right
22	31133	Right
23	31670	Left
24	31670	Left
25	31670	Left
26	31670	Left
27	31670	Left
28	31670	Left
29	31670	Left
30	31670	Left
31	31670	Left
32	31670	Left
33	31670	Left
34	31670	Left
35	31670	Left
36	31670	Left
37	31670	Left
38	31670	Left
39	31670	Left
40	31670	Left
41	41504	Right
42	42580	Right
43	43580	Right
44	43580	Right
45	43580	Right
46	43775	Right

NOTE:-
 IF GENERAL RRPMs SHALL BE PROVIDED AT THE FOLLOWING SPACINGS -
 STRAIGHT SECTIONS
 - SPACING @2M C/C (EDGE LINE RED MARKER)
 - SPACING @M C/C (CENTRE LINE WHITE MARKER)
 CURVED SECTIONS
 - SPACING @M C/C (EDGE LINE RED MARKER)
 - SPACING @M C/C (CENTRE LINE WHITE MARKER)

VALECHA ENGINEERING LTD.
 Contractor



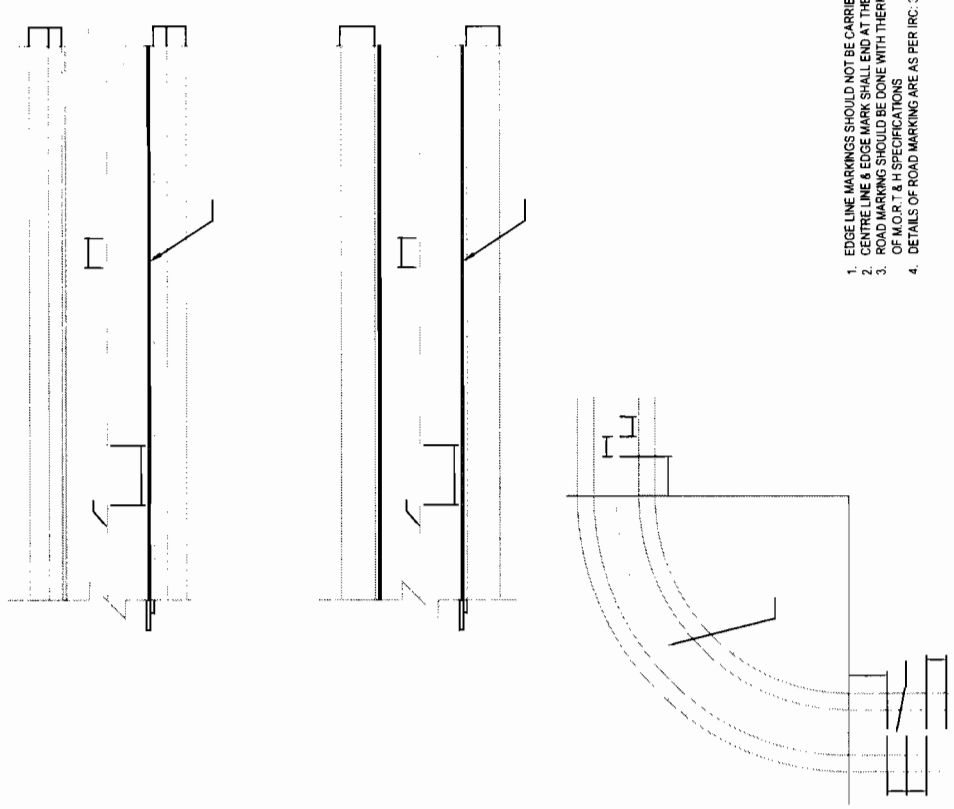
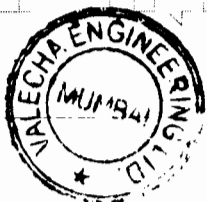
Chief Engineer, Engineer,
 World Bank Project, Odisha
 O/o the E.I.C. (Civil), Odisha
 Rhubaneswar.

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@cegroupindia.com

SCHEDULE OF RRPMS
 Sheet 2 of 2
 JAGATPUR TO DUHURIA

DRG NO.	OSRP/CEGR/RRM	APPROVED BY	APPROVED (D)
SH. NO.	28	DATE	12/12/12
SCALE		REV	R-1
		PREPARED BY	E.E., PMU
		CEG, LTD.	World Bank Projects



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

DRG NO.		OS/PC/CEGRM/MT		DESIGNED BY		DRAWN BY		REV. RT		APPROVED ID.	
SH. NO.		29		DATE		12/12/13		REV		R-1	
SCALE						CEG		CEG		EE(PMU)	
						NTS				CE.WBP	

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

PROJECT:-
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

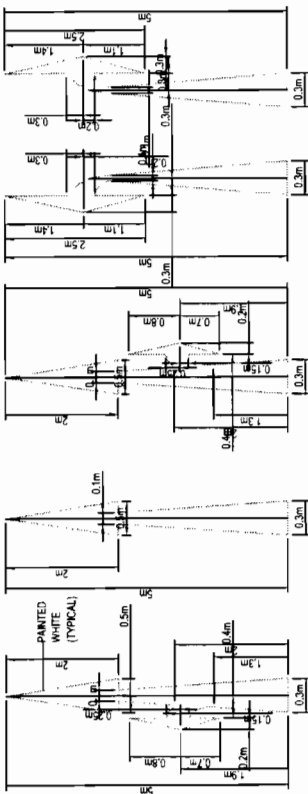
CONSULTING ENGINEERS GROUP LTD.
Plot-12, Moji Colony, Malviya Nagar Jaipur-17
Tel: +91-141-2520899, 2521899, 2520556
Fax: 2521348, e-mail: ceg@cegroupindia.com



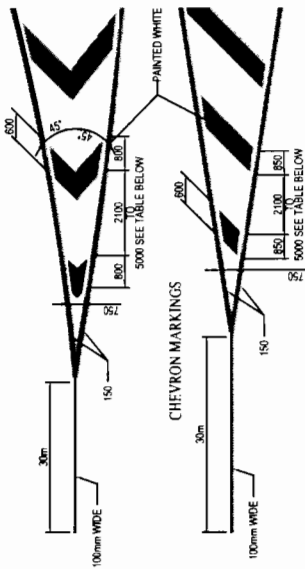
Chief Engineer,
World Bank Projects, Orisha
Chief Engineer, Employer
World Bank Project
to the E.I.C.(Civil), Odisha
Bhubaneswar.



DIRECTIONAL ARROWS

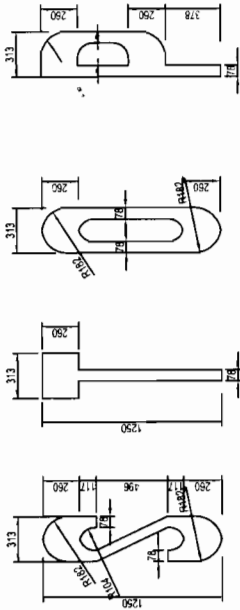


DIAGONAL MARKINGS

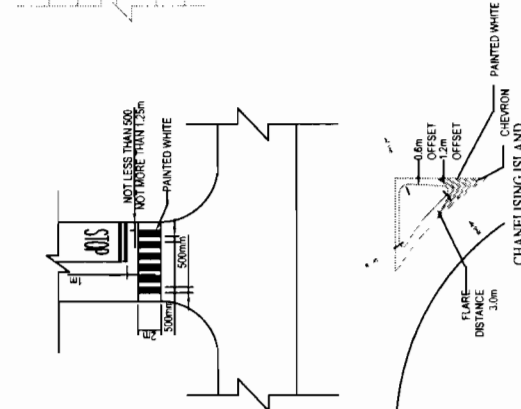


TOTAL LENGTH OF MARKING (m)	SPEED (km/h)	SPEED (mph)
45	2100	1300
810.22	3000	1875
22	2000	1250
110	4000	2500
	6000	3750

SIZE OF LETTERS



PEDESTRIAN CROSSING



NOTE:

1. ALL LENGTHS AND SPACINGS IN THE TABLE ARE MEASURED PARALLEL TO ROAD CENTRE LINE.
2. FIRST DIAGONAL OR CHEVRON IS TO BE SO LOCATED THAT 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. OSR/PC/CEG/01.
5. ROAD MARKING SHOULD BE DONE WITH THERMOPLASTIC PAINT CONFORMING TO CL 893.4 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.

PEDESTRIAN CROSSING

FOR SCHEDULE OF PEDESTRIAN XING REFER DRAWING NO: OSR/PC/EG/SCH-P.Xing

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@cegroupindia.com



Chief Engineer,
Roads & Bridges, Odisha
Under the E.I.C.(Civil), Odisha
Bhubaneswar.

**STANDARD DRAWINGS
TYPICAL ROAD MARKING & CHEVRON MARKING DETAILS
(SHEET 2 OF 2)**

DRG NO.	OSR/PC/EG/C-1000/M/RM/02	DESIGNED BY	CEG	DRAWN BY	CEG	REVISED BY	EE(PMU)	APPROVED (D)	CE/WBP
SH. NO.	30	DATE	12/12/12	REV	R-1	PREPARED BY			
SCALE			N.T.S						



SCHEDULE OF PEDESTRIAN CROSSING

SL.NO.	CHAINAGE	DESCRIPTION	SL.NO.	CHAINAGE	DESCRIPTION
1	2327.5	HOSPITAL	41	35622	HOSPITAL
2	3802.5	BB_LEFT	42	36973	SCHOOL
3	4156	SCHOOL	43	37852.5	BB_RIGHT
4	4349	SCHOOL	44	38422.5	BB_LEFT
5	4403	BB_RIGHT	45	38622.5	BB_RIGHT
6	4484	SCHOOL	46	43282.5	BB_RIGHT
7	5411	SCHOOL	47	43742.5	BB_LEFT
8	5715	SCHOOL	48	44852.5	BB_RIGHT
9	5792.5	BB_LEFT	49	48062	HOSPITAL
10	6253	BB_RIGHT	50	48152.5	BB_LEFT
11	7502.5	BB_LEFT			
12	7803	BB_RIGHT			
13	9252.5	BB_LEFT			
14	9692.5	BB_RIGHT			
15	10297.5	SCHOOL			
16	10652.5	BB_LEFT			
17	10952.5	BB_RIGHT			
18	13032.5	BB_LEFT			
19	14002.5	BB_RIGHT			
20	16802.5	BB_LEFT			
21	17152.5	BB_RIGHT			
22	18147.5	HOSPITAL			
23	18722.5	BB_RIGHT			
24	18773	SCHOOL			
25	19534.5	HOSPITAL			
26	19578	SCHOOL			
27	19611	HOSPITAL			
28	20077	HOSPITAL			
29	20352.5	BB_LEFT			
30	23952.5	BB_RIGHT			
31	24041	HOSPITAL			
32	24352.5	BB_LEFT			
33	26648	HOSPITAL			
34	26734	HOSPITAL			
35	26952.5	BB_RIGHT			
36	27212.5	BB_LEFT			
37	27446	HOSPITAL			
38	31002.5	BB_RIGHT			
39	32902.5	BB_LEFT			
40	33752.5	BB_RIGHT			

SCHEDULE OF PEDESTRIAN CROSSING & GUARD POSTS

DRG. NO.	OSRP, CEG, SH-9A & SH-9	SCH-P, Xing	DESIGNED BY	DRAWN BY	PREPARED BY	APPROVED BY
SH. NO.	165	DATE	12/12/12	RFV	R-1	EE, PMU
SCALE	NTS		CEG	CEG	CEG	CF, WRP

CLIENT :-
WORKS DEPARTMENT
GOVT. OF ODISHA

CONSULTING ENGINEERS GROUP LTD.
E-12, Moj Colony, Malviya Nagar, Jaipur-17
Tel: +91-141-2520899, 2521899, 2520556
Fax: 2521348, e-mail: ceg@cegroupindia.com

PROJECT :-
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE
Chief Engineer,
World Bank Project Office,
Oro the E.I.C.(Civil), Odisha
Bhubaneswar.



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@cegroupindia.com

STANDARD DRAWINGS
TYPICAL ROAD SIGNS (SHEET 1 OF 4)

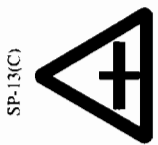
DRG NO.	08R/CEG/RS/01	DESIGNED BY	CEG	APPROVED (D)	CE/WBP
SH. NO.	31	DATE	12/12/12	REV	R-1
SCALE	NTS			DRAWN BY	CEG
				PREPARED BY	EE(PMU)



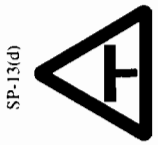
STAGGERED INTERSECTION



STAGGERED INTERSECTION



MAJOR ROAD AHEAD



MAJOR ROAD AHEAD



Y-INTERSECTION



Y-INTERSECTION



Y-INTERSECTION



GAP IN MEDIAN



OVERHEAD CABLE



NARROW BRIDGE



DUAL C' WAY STARTS



DUAL C' WAY ENDS



SERIES OF BENDS



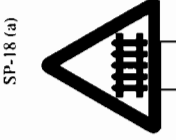
HUMP OR ROUGH ROAD



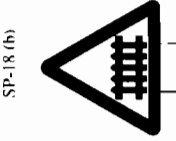
BARRIER AHEAD



STATE ROUTE MARKER SIGN



GUARDED RAILWAY CROSSING AT 200m



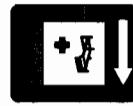
GUARDED RAILWAY CROSSING AT 50-100m



PUBLIC TELEPHONE



PETROL BUNK



HOSPITAL



DISPENSARY



EATING PLACE

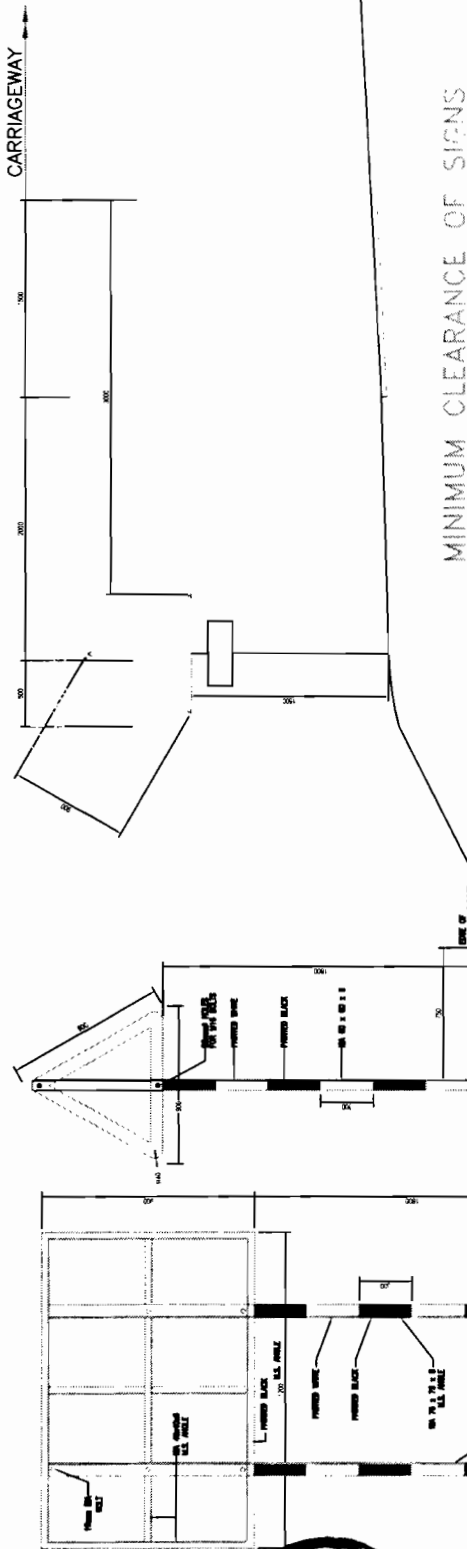
LEGEND

	WHITE SHEET
	BLACK SHEET
	RED SHEET
	BLUE SHEET

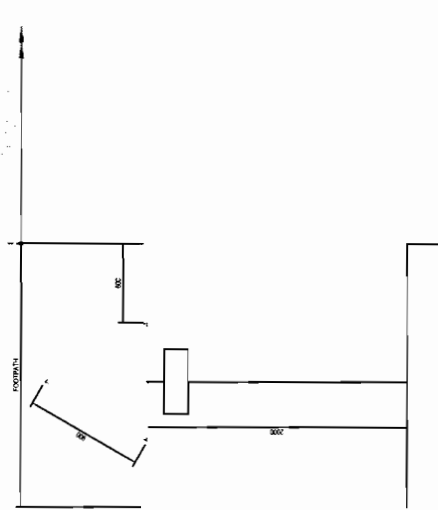
1. THIS SET OF SIGNS IS PREPARED BY THE ROAD DEPARTMENT, ODISHA.
2. THESE SIGNS ARE TO BE USED IN THE STATE OF ODISHA.
3. ALL MATERIALS AND WORKMANSHIP SHALL BE AS PER THE SPECIFICATIONS AND STANDARDS OF THE ROAD DEPARTMENT, ODISHA.
4. ALL THE SIGNS SHALL BE MAINTAINED IN GOOD CONDITION AND REPLACED WHEN NECESSARY.

<p>PROJECT:- ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE</p>		<p>STANDARD DRAWINGS TYPICAL ROAD SIGNS (SHEET 2 OF 4)</p>				<p>APPROVED (D)</p>
		<p>DESIGNED BY</p>	<p>DRAWN BY</p>	<p>REV. #1</p>	<p>PREPARED BY</p>	<p>EE(PMU)</p>
<p>DRG NO.</p>	<p>OSR/PC/CEG/902</p>	<p>DATE</p>	<p>12/12/12</p>	<p>REV</p>	<p>R-1</p>	<p>SCALE</p>
<p>SH. NO.</p>	<p>32</p>	<p>NTS</p>		<p>CEG</p>	<p>CEG</p>	<p>CE(WBP)</p>

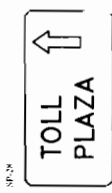
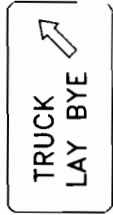
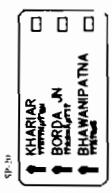
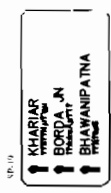
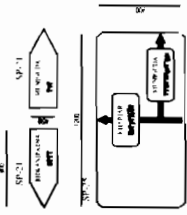
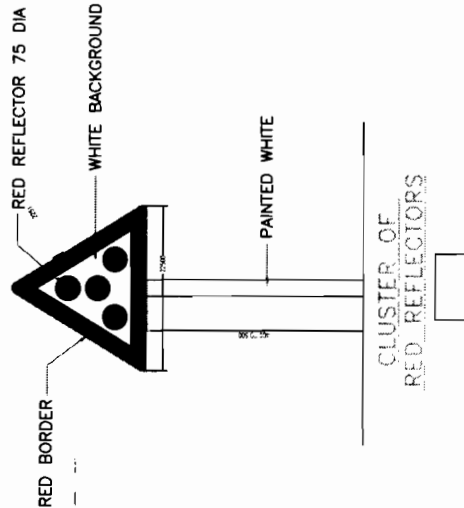
CEG ENGINEERS GROUP LTD.
E-12, Moji Colony, Malviya Nagar, Jaipur-17
Tel: +91-141-2520899, 2521899, 2520556
Fax: 2521348, e-mail: ceg@cegindia.com



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:67-2001.
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 FIXED OVER ALUMINIUM SHEET AS PER MORTH SPECIFICATIONS.
6. ROUTE MARKER SIGN FOR NH IS AS PER IRC :2-1968.
7. SIGNS WITH AN AREA UP TO 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.

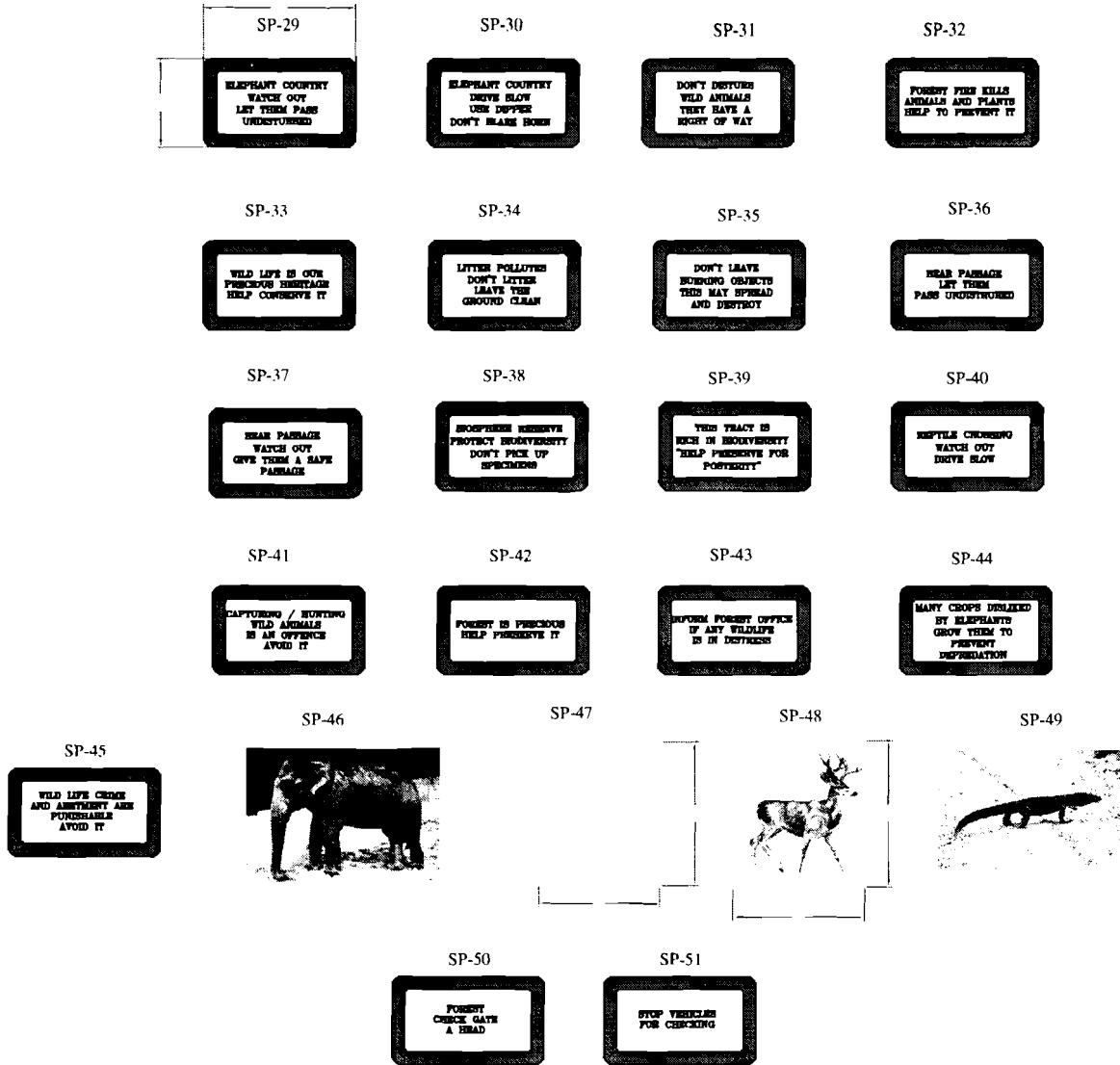
PROJECT:-
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

STANDARD DRAWINGS
TYPICAL ROAD SIGNS (SHEET 3 OF 4)

DRG NO.	DSR/PC/GRS/03	DESIGNED BY	CEG	DRAWN BY	CEG	REVISED BY	EE/PMU	APPROVED (D)	CE/WBP
SH. NO.	33	DATE	12/12/12	REV	R-1	PREPARED BY			
SCALE		NTS							

CEG ENGINEERS GROUP LTD.
B-12, Moji Colony, Malviya Nagar, Jaipur-17
Tel: +91-141-2520899, 2521899, 2520556
Fax: 2521348, e-mail: ceg@cegindia.com





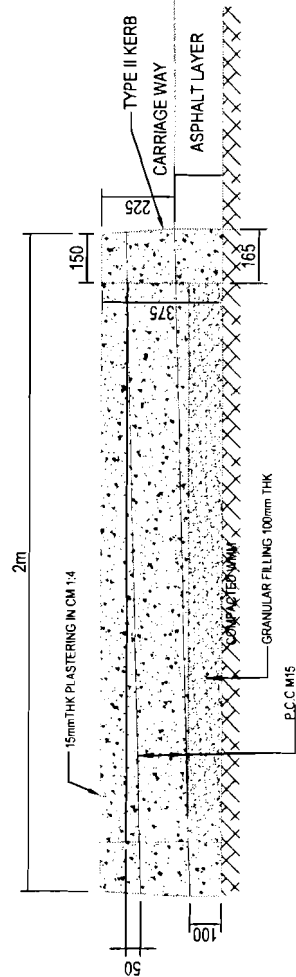
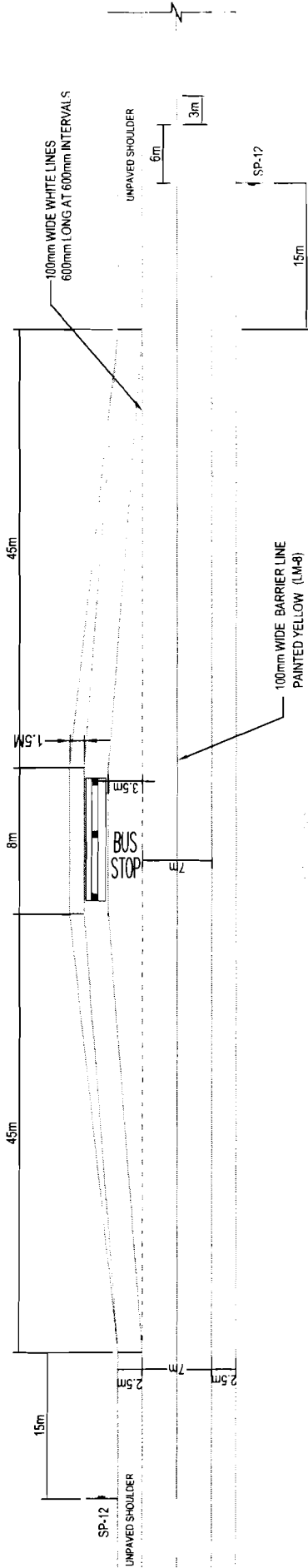
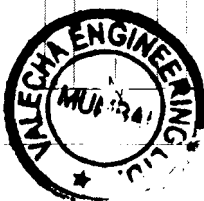
1. The signs shall be made of aluminum plate or equivalent material. The signs shall be made of aluminum plate or equivalent material. The signs shall be made of aluminum plate or equivalent material.

World Bank
Over
the E.I.C.(Civil, Odisha)
Rindane swai.

CEG 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

PROJECT:-
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

STANDARD DRAWINGS										
TYPICAL ROAD SIGNS (SHEET 4 OF 4)										
DRG NO.	OSRP/CEGRS/04					DESIGNED BY	DRAWN BY	REV.R1	APPROVED (D)	
SH. NO.	34	DATE	12/12/12	REV	R-1	CEG	CEG	PREPARED BY		
SCALE	NTS							EE(PMU)	GE.WBP	



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

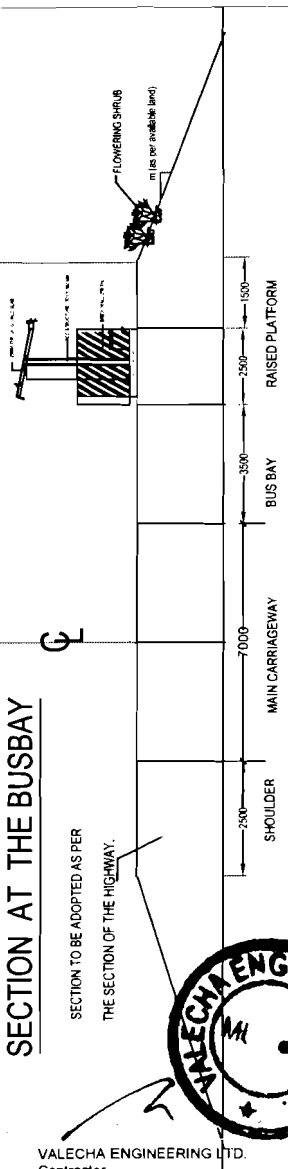
PROJECT:-
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

TYPICAL BUS BAY SHEET - 1
(JAGATPUR -DUJHURIA)

DRG. NO.	(AS/PC/CEG/8001)	DESIGNED BY	CEG	APPROVED BY	CE.WBP
SH. NO.	35	DATE	12/12/12	REV	R-1
SCALE				NTS	
		DRAWN BY	CEG	PREPARED BY	EE(PMU)

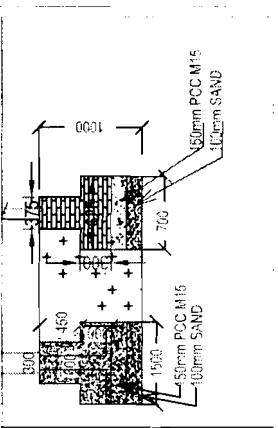
CONSULTING ENGINEERS GROUP LTD.
E-12, Moji Colony, Malviya Nagar, Jaipur - 17
Tel: +91-141-2520899, 2521899, 2520556
Fax: 2521348, e-mail: ceg@cegroupindia.com

SECTION AT THE BUSBAY

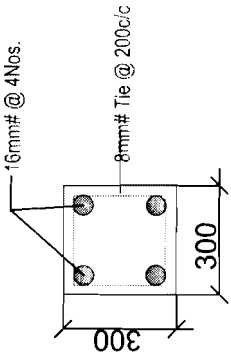


SCHEDULE OF BUS BAYS

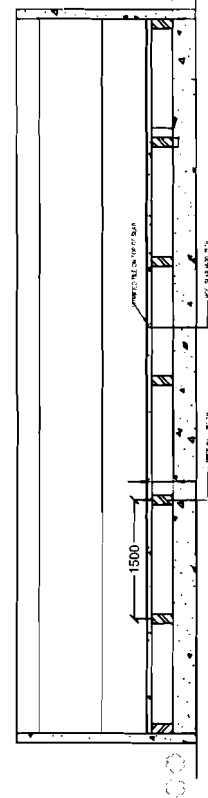
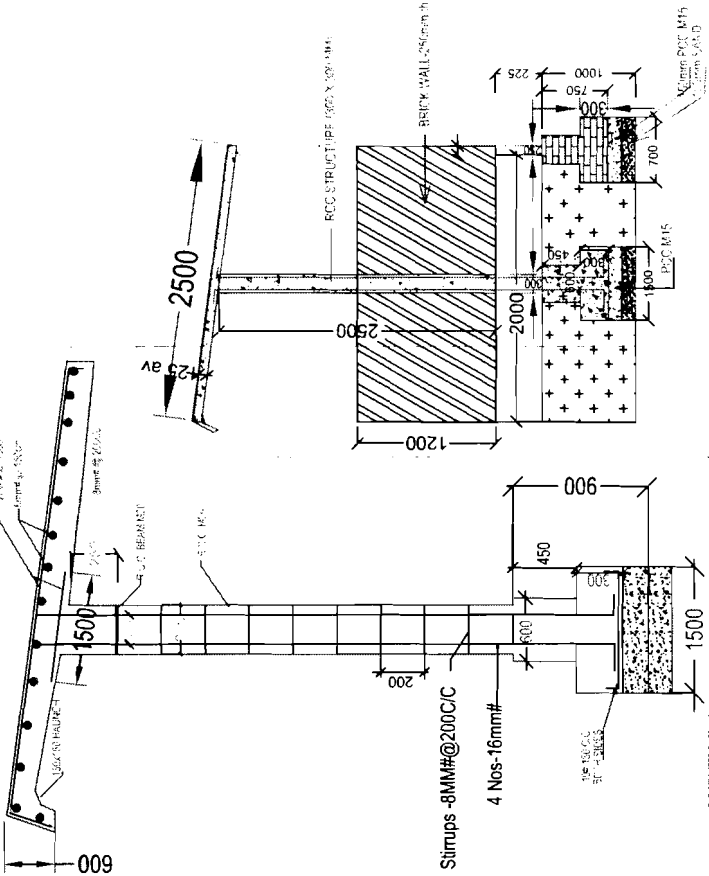
Sl. No.	Chainage	side
1	2000	R
2	4350	R
3	6200	R
4	7750	R
5	9640	R
6	10200	R
7	10900	R
8	13950	R
9	14000	R
10	15600	R
11	16750	R
12	18650	R
13	19175	R
14	20300	R
15	22220	R
16	24300	R
17	27160	R
18	28000	R
19	29650	R
20	31000	R
21	32850	R
22	34000	R
23	35250	R
24	36950	R
25	38370	R
26	41150	R
27	43690	R
28	44650	R
29	45850	R
30	48100	R



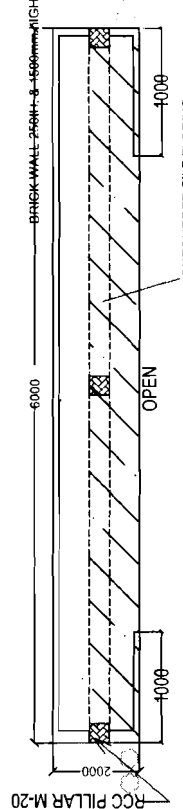
REINFORCEMENT PLAN OF COLUMN



REINFORCEMENT OF BEAM



SECTION OF BUS SHELTER



PLAN FOR BUS SHELTER

TYPICAL BUS BAY SHEET - 2

(JAGATPUR - DUHURIA)

DRG NO.	DATE	DESIGNED BY	DRAWN BY	REV	APPROVED (D)
SH. NO.	36	12/12/12	CEG	R-1	EE(PMU)
SCALE	NTS		CEG	CEG	CE.WBP

PROJECT:-
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

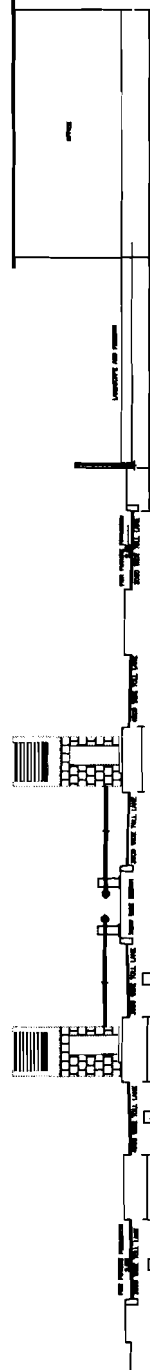
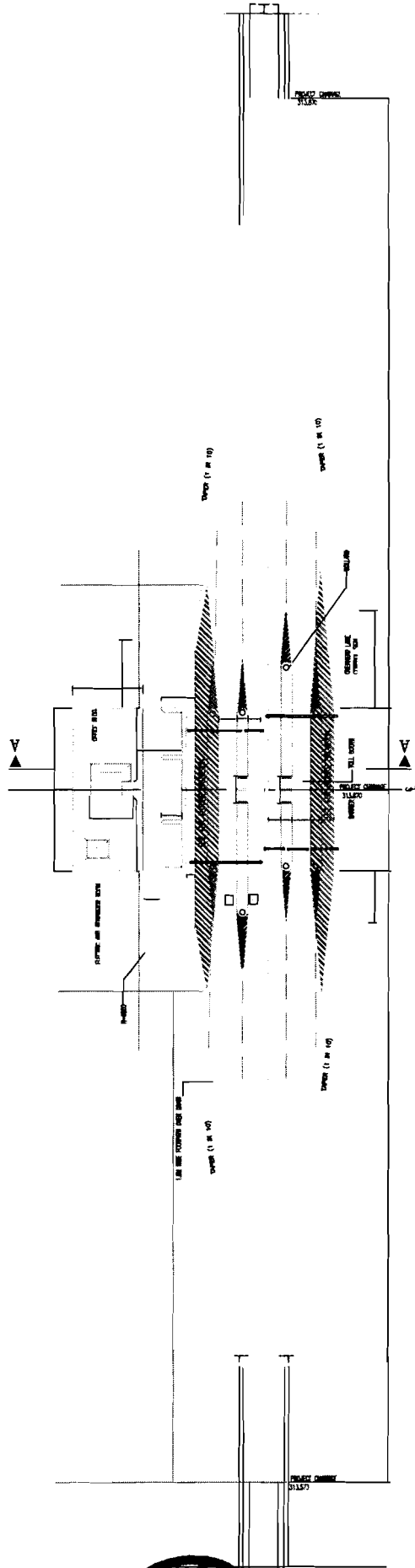
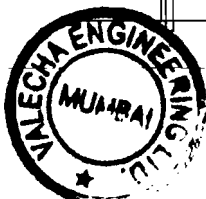
CONSULTING ENGINEERS GROUP LTD.
12, Moji Colony, Malviya Nagar, Jaipur-17
Tel: +91-141-2520899, 2521899, 2520556
Fax: 2521348, e-mail: ceg@cegroupindia.com

NOTE:
1. CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN AND CONSTRUCTION OF THE BUS BAY SHEET.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF THE BUS BAY SHEET.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIRS OF THE BUS BAY SHEET.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPLACEMENT OF THE BUS BAY SHEET.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DISPOSAL OF THE BUS BAY SHEET.



VALECHA ENGINEERING LTD.
Contractor

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



- RESERVED LANE FOR THROUGH TRAFFIC (VEHICLES WHO HAVE PAID TOLL AT PREVIOUS TOLL PLAZA)
- RESERVED LANE FOR THROUGH TRAFFIC (VEHICLES WHO HAVE PAID TOLL AT PREVIOUS TOLL PLAZA)
 - GENERAL LANE
 - RESERVED LANE FOR MULTI AXLE VEHICLES

NOTE:-

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

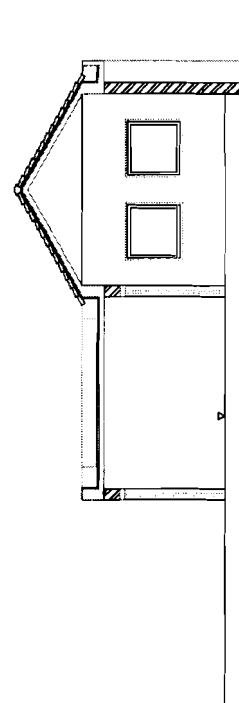
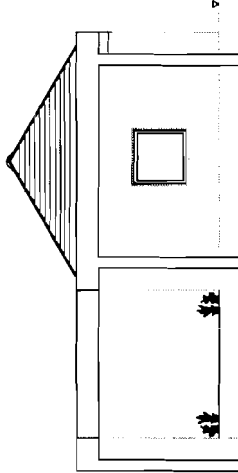
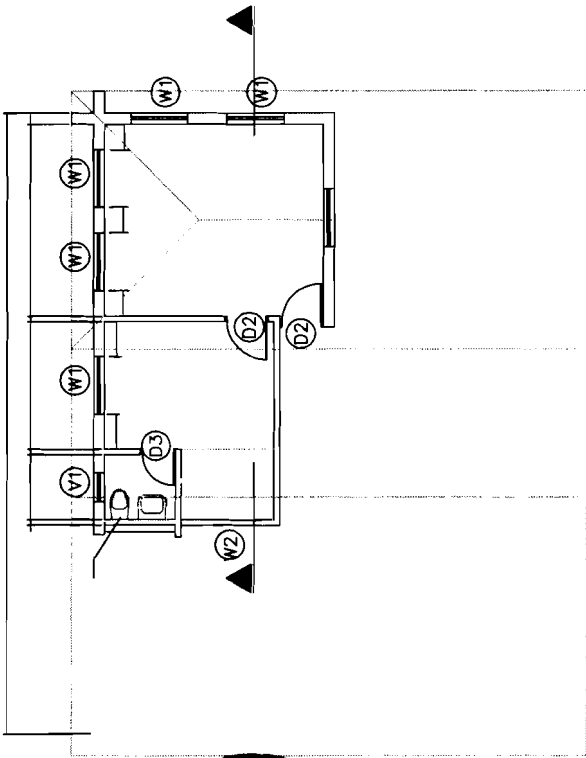
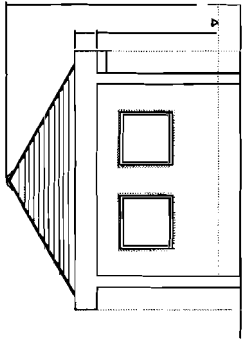
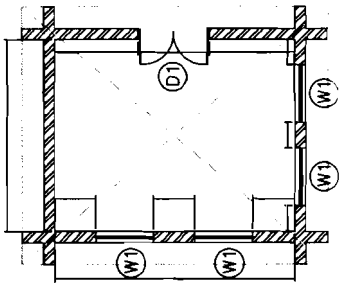
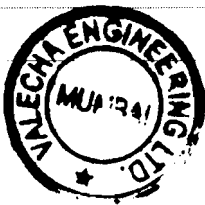
LOCATION: KM-31+00 TO KM-32+140

PROJECT:-

ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE.

STANDARD DRAWINGS
TOLL PLAZA LAYOUT (KM31+330 TO KM.31+670)
(JAGATPUR -DUHURIA)

DRG NO. 08R/CEG/JAGATPUR/170	DATE DEC-12	REV R1	PREPARED BY: CED LAL	APPROVED: CE WIP
SH. NO. 45	DATE DEC-12	REV R1	CEP LAL	CE WIP
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:-

ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE.

STANDARD DRAWINGS
TOLL PLAZA MAIN OFFICE
TOLL PLAZA LOCATION :-KM.31+330 TO KM.31+670
(JAGATPUR - DUHURIA)

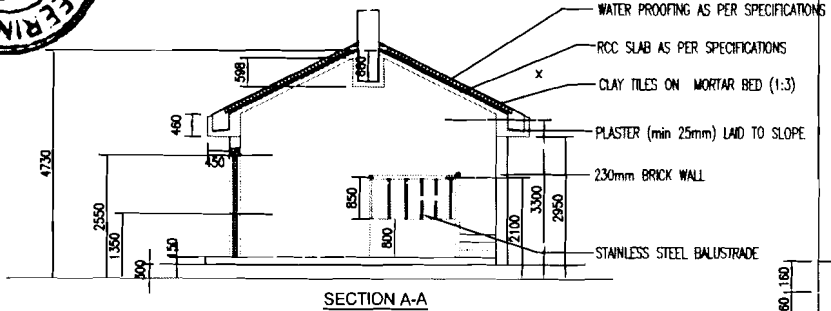
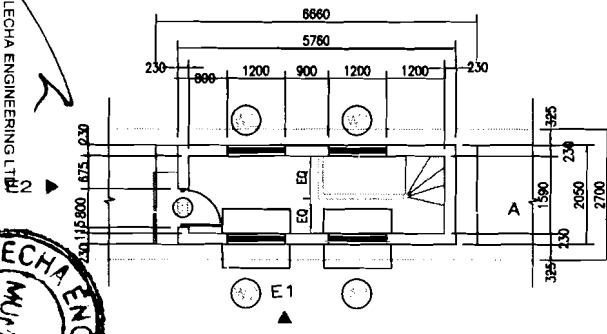
DRG NO. : SH. NO. : SCALE :	DATE : 46	DEC.12	REV	R1	NTS	PREPARED BY : CEJ/MAU	REV. BY : APPROVED
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Chief Engineer,
World Bank Project, Odisha
the E.I.C.(Civil), Odisha
Bhubaneswar.

VALECHA ENGINEERING LTD
Contractor

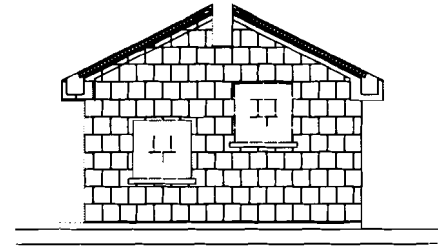
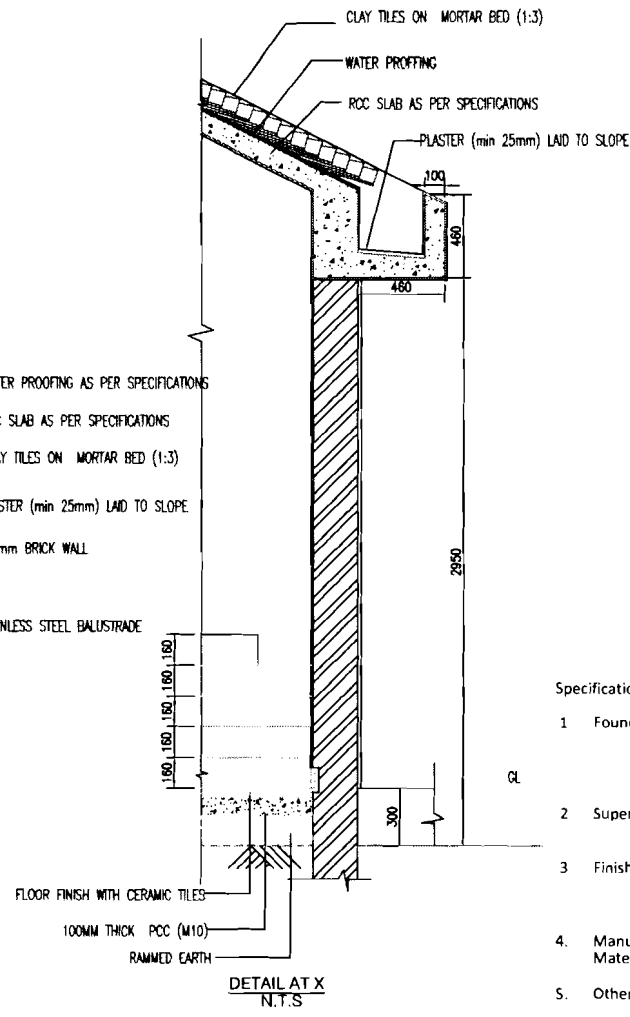


Volume IV Page 127 of 160

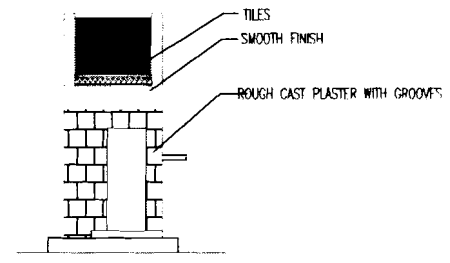


SCHEDULE OF DOORS & WINDOWS

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



FRONT ELEVATION E1



ELEVATION E2

Specifications for Toll Plaza

- Foundation
 - RCC of M20 grade for Raft/ Footing/ Pedestal, columns and plinth band
 - Filling with sand
 - Antitermite treatment
 - Damp Proof Course
- Super structure
 - Walls with Brick work in cement mortar 1:6
 - RCC continuous lintels in M20
 - Slab and Beams in RCC of M20 grade
 - External plaster 5mm thick in C.M. 1:6
 - Exterior Acrylic emulsion painting
 - Interior Acrylic emulsion painting
 - Vitrified floor tiles of size 605mm x 605mm (double charged)
- Finishing
 - Reinforcing steel, structural steel, cement, paints to be approved by Engineer before use in the works and a Manufacturer's Test Certificate to be produced for each batch of supply
- Other materials
 - Materials such as sand, stone aggregate, earth to pass the acceptance criteria
- Fabricated Materials
 - Materials for shutters, grills and similar items will be as per technical specifications
- Fittings and Fixtures
 - Sanitary fittings, electrical fittings, hardware fittings and all such materials have to be approved by the Engineer
- Doors:
 - One side Teak veneer Flush Doors of thickness 35mm conforming to IS 2202(Part-I), 1999
- Windows:
 - Anodised Aluminium Window frames and shutters conforming to IS-1081, with 5mm thick glazing and MS grills in the masonry opening.
- Reinforcement
 - All reinforcements shall conform to Grade Fe 500 of IS-1786

PROJECT:-

ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE.

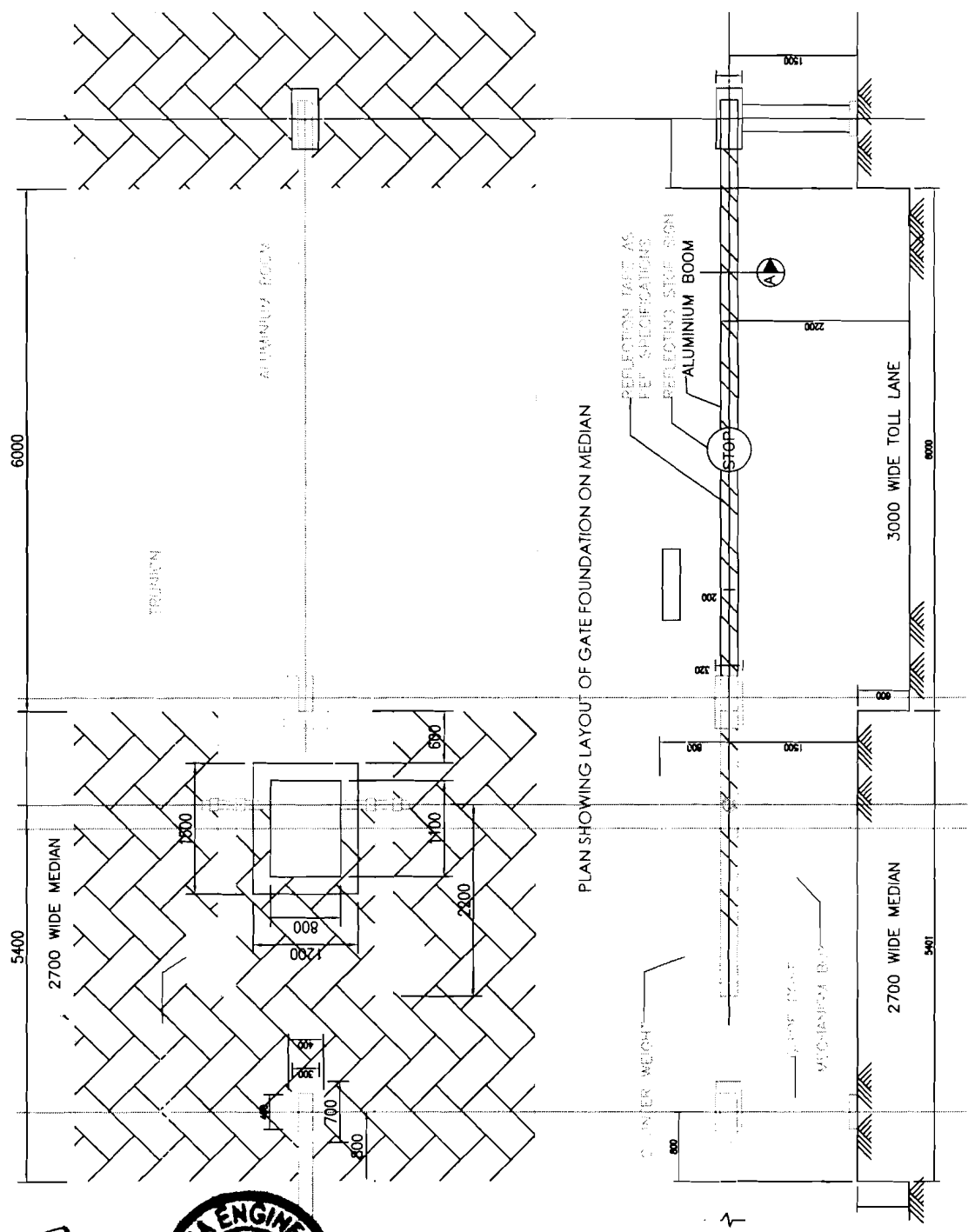
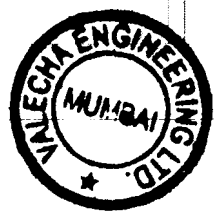
STANDARD DRAWINGS
TOLL BOOTH
TOLL PLAZA LOCATION :-KM.31+330 TO KM.31+670

(JAGATPUR - DUHURIA)

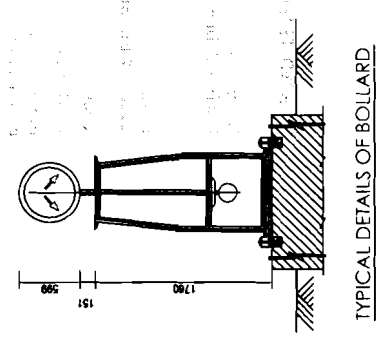
DRG NO.	DSR/PC/EG/JD-49KM/TP/03				REV. R1	APPROVED
SH. NO.	47	DATE	DEC, 12	REV	R1	PREPARED BY :
SCALE	NTS				DES. L.M.L.	CE, WBP

Chief Engineer,
Orissa State Road Projects Division,
World Bank Project, Odisha
Bhubaneswar.

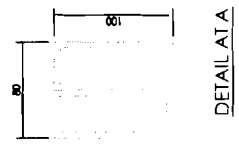
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PLAN SHOWING LAYOUT OF GATE FOUNDATION ON MEDIAN



TYPICAL DETAILS OF BOLLARD



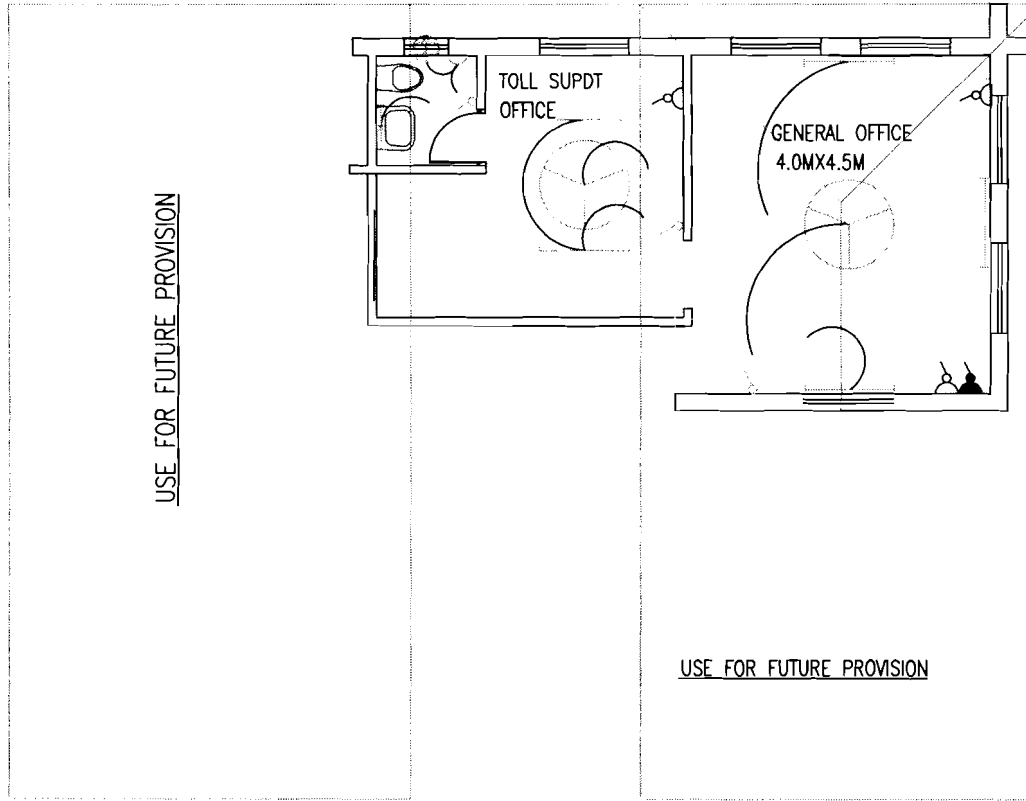
DETAIL A

PROJECT:-

ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE.

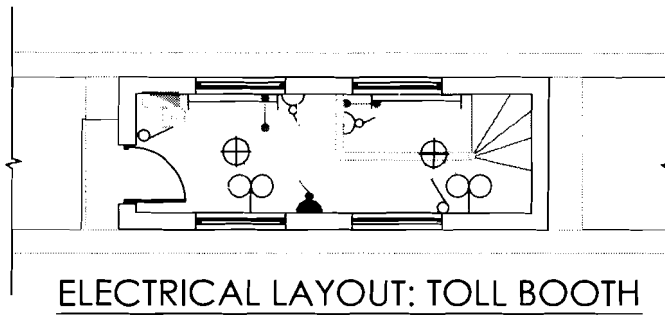
STANDARD DRAWINGS
BARRIER GATE FOR TOLL PLAZA
TOLL PLAZA LOCATION: KM:31+330 TO KM:31+670
(JAGATPUR - DUHURIA)

DRG NO. 038/EC/CP-OR/W/PM	DATE DEC.12	REV R1	PREPARED BY: CE/PMU	APPROVED: CE, W/P
SH. NO. 48	DATE DEC.12	REV R1	DESIGNED BY: CE/PMU	APPROVED: CE, W/P
SCALE	NTS			



- 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

ELECTRICAL LAYOUT: TOLL PLAZA MAIN OFFICE



PROJECT:-

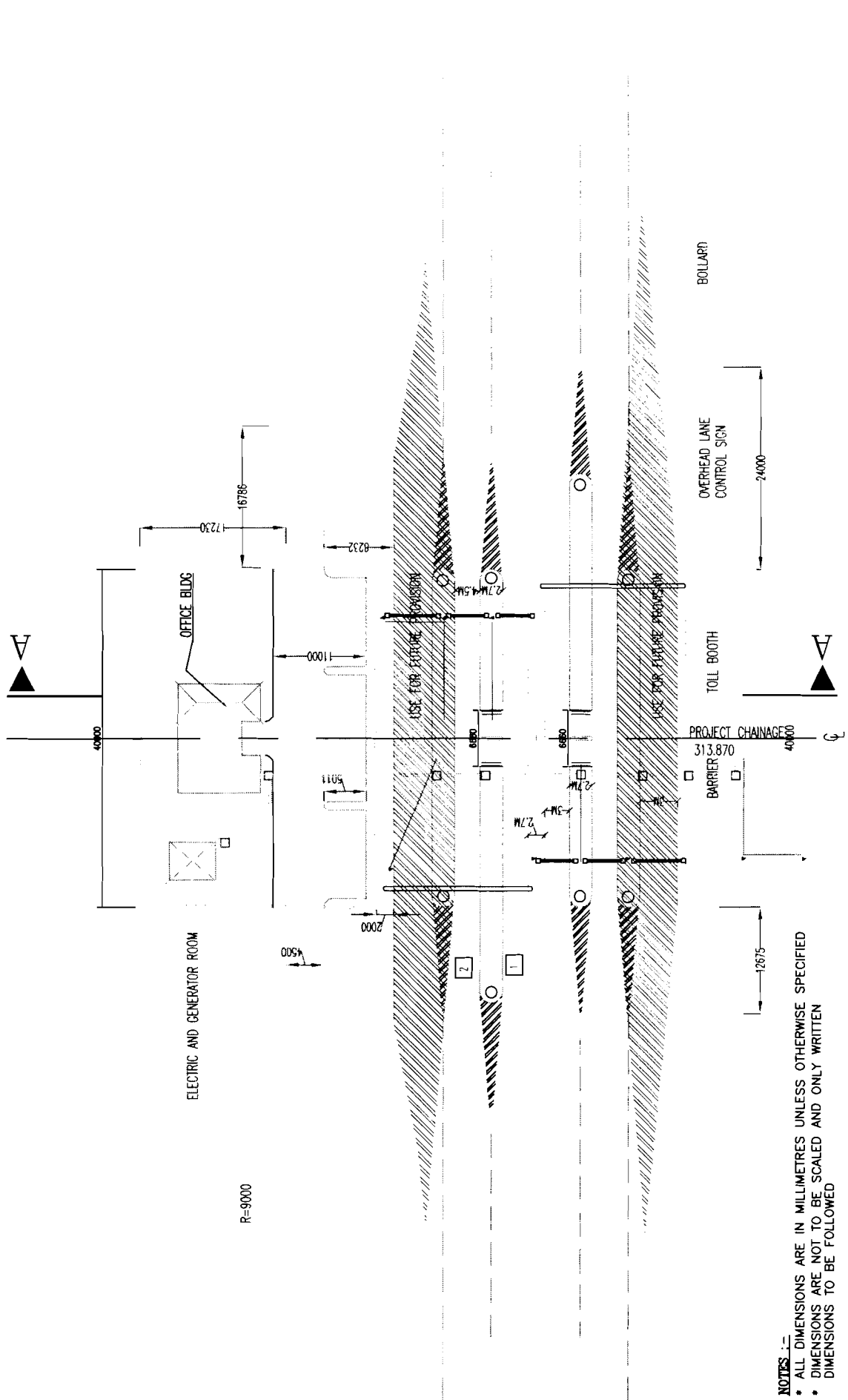
ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE.

STANDARD DRAWINGS
ELECTRICAL LAYOUT(KM31+330 TO KM.31+670)
TOLL PLAZA AND MAIN OFFICE

(JAGATPUR - DUHURIA)

DRG NO.	OSR/PC/EG/JD-48KM/TP/MS				REV. R1	APPROVED
SH. NO.	49	DATE	DEC.12	REV	R1	PREPARED BY :
SCALE	NTS				CE/PMU	CE. WBP

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



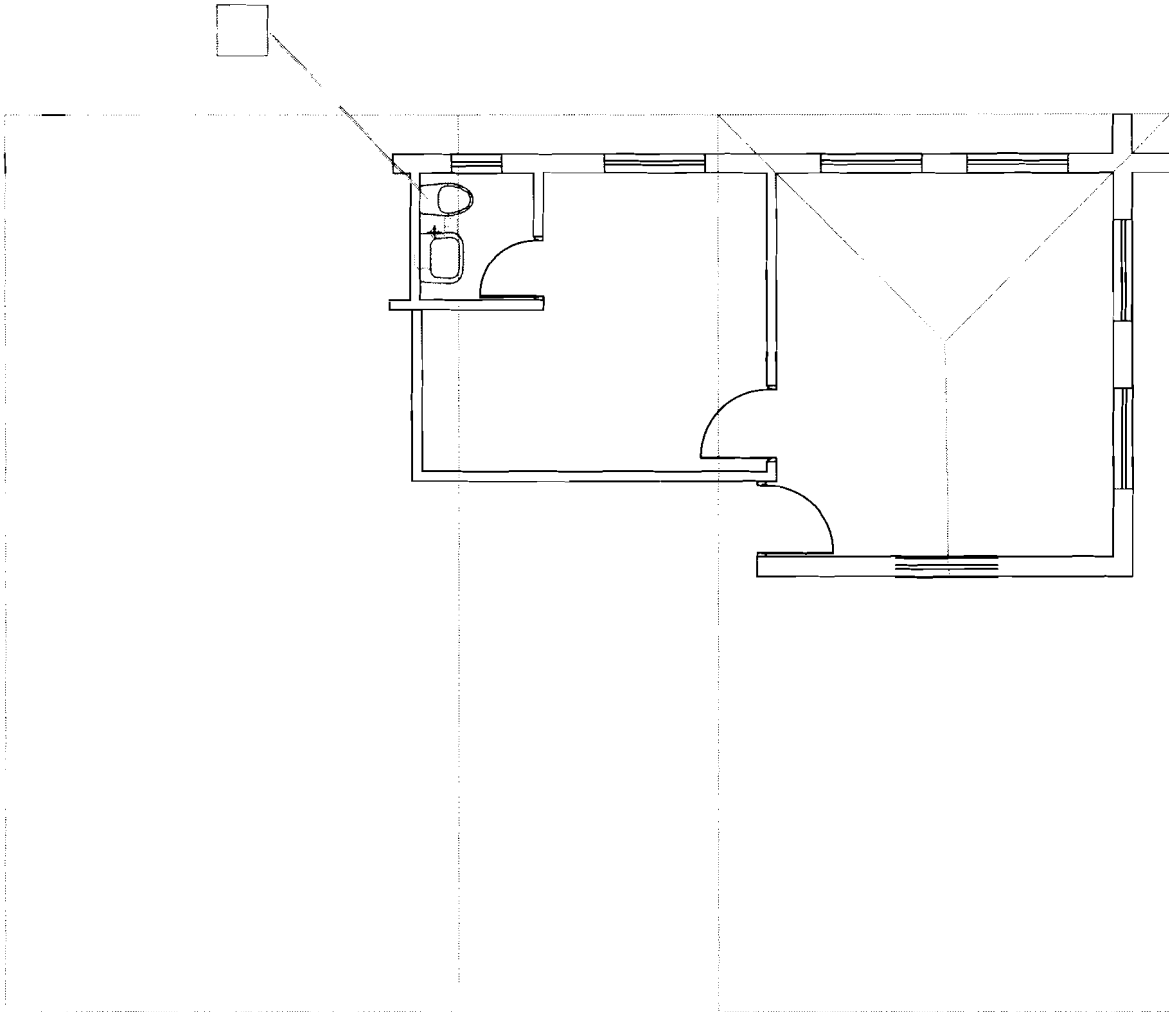
NOTES :-
 * ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED
 * DIMENSIONS ARE NOT TO BE SCALED AND ONLY WRITTEN DIMENSIONS TO BE FOLLOWED

STANDARD DRAWINGS
ELECTRICAL LAYOUT - TOLL PLAZA (KM.31+330 TO KM.31+670)
 (JAGATPUR - DUHURIA)

DRG NO.	DATE	REV	REV	REV	APPROVED
50	DEC.12	REV	R1		CE/IMP
SCALE	NTS			PREPARED BY :	CE/IMP
				CDL LAL	

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

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



PROJECT:-

ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE.

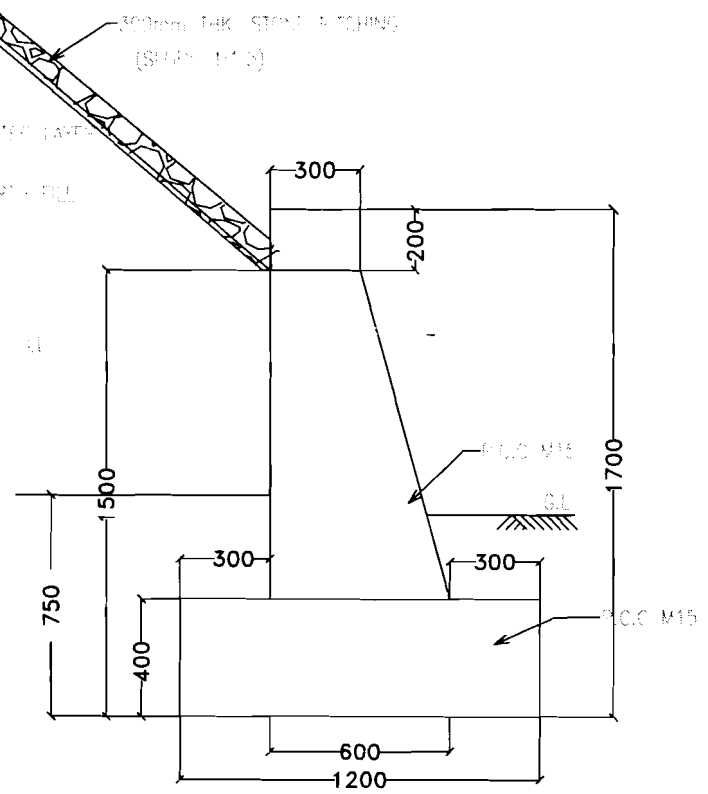
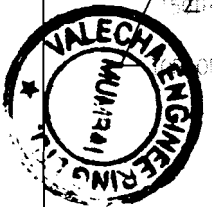
**STANDARD DRAWINGS
PLUMBING LAYOUT - TOLL PLAZA(KM.31+330 TO KM.31+670)**

(JAGATPUR - DUHURIA)

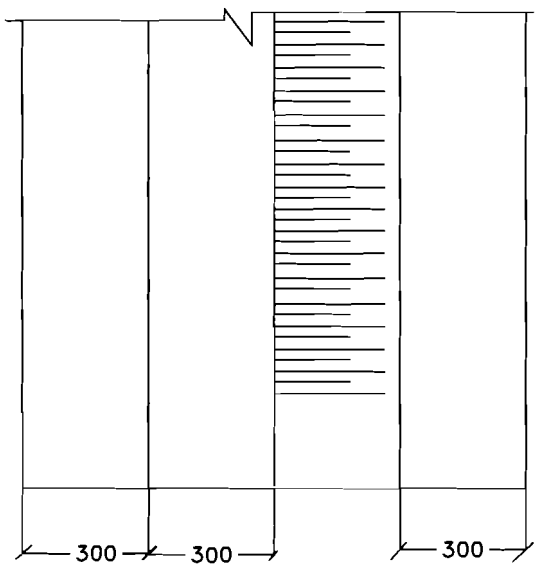
DRG NO.	OSRP/CEG/JD-49KWT/07					PREPARED BY :	REV. R1	APPROVED
SH. NO.	51	DATE	DEC.12	REV	R1			
SCALE	NTS					DES. LMG.	EE/PMU	CE, WBP

Chief Engineer
Water Supply & Sewerage
Orissa
E.P.O. No. 100/2013
Rajbanswar.

VALECHA ENGINEERING LTD.
Contractor



TOE WALL FOR POND
(CROSS SECTION)



PLAN OF TOE WALL FOR WATER BODY

Sl. No.	Item	Change at Km	Location left right	Mtrs.	Length of toe wall in
1	Pond	4.477	R	30	
2	Pond	5.306	R	25	
3	Pond	7.411	L	15	
4	Pond	7.459	R	35	
5	Pond	11.585	R	95	
6	Pond	34.424	L	25	
7	Pond	38.86	L	30	
8	Pond	45.928	R	70	

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

CONSULTING ENGINEERS GROUP LTD.

E-12, Majji Colony, Malviya Nagar Jaipur-17
Tel: +91-141-2520899, 2521899, 2520556
Fax: 2521348, e-mail: ceg@ceindia.com

PROJECT:-

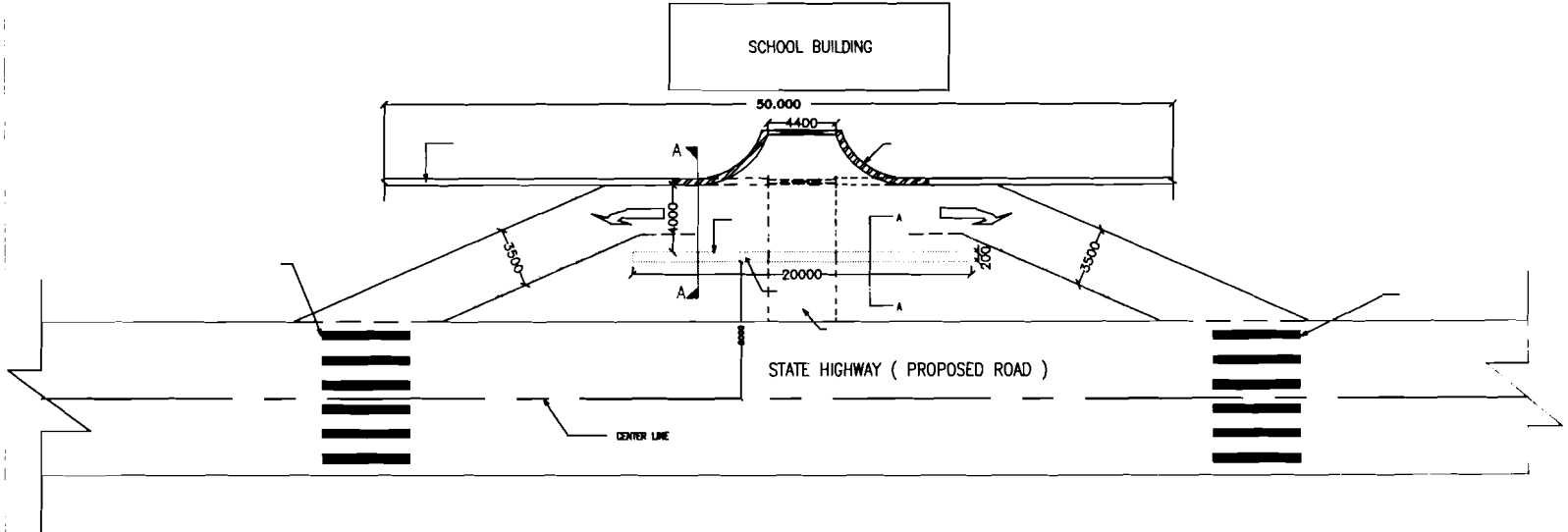
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

TYPICAL PCC TOE WALL WITH STONE PITCHING FOR WATER BODIES AS ENVIRONMENTAL MITIGATION.

(JAGATPUR - DUHURIA)

DRG NO.	OSRP/CEG/JD-49KM/ENV/03				DESIGNED BY	DRAWN BY	REV.R1	APPROVED
SH. NO.	DATE	DEC, 12	REV	R-1	CEG	CEG	EE(PMU)	CE,WBP
SCALE	NTS							

Item	Chainage	Location L/R	Affected Length in mtrs
1 School, Gujarpur	4.33	Left	40
2 School	5.382	Left	58
3 School	5.7	Left	34
4 School	10.275	Right	20
5 School	19.565	Left	41
6 School	50.36	Right	10
7 Hospital	2.3	Left	78
8 Hospital	26.695	Left	78
Temple	6.120	Left	15



- 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



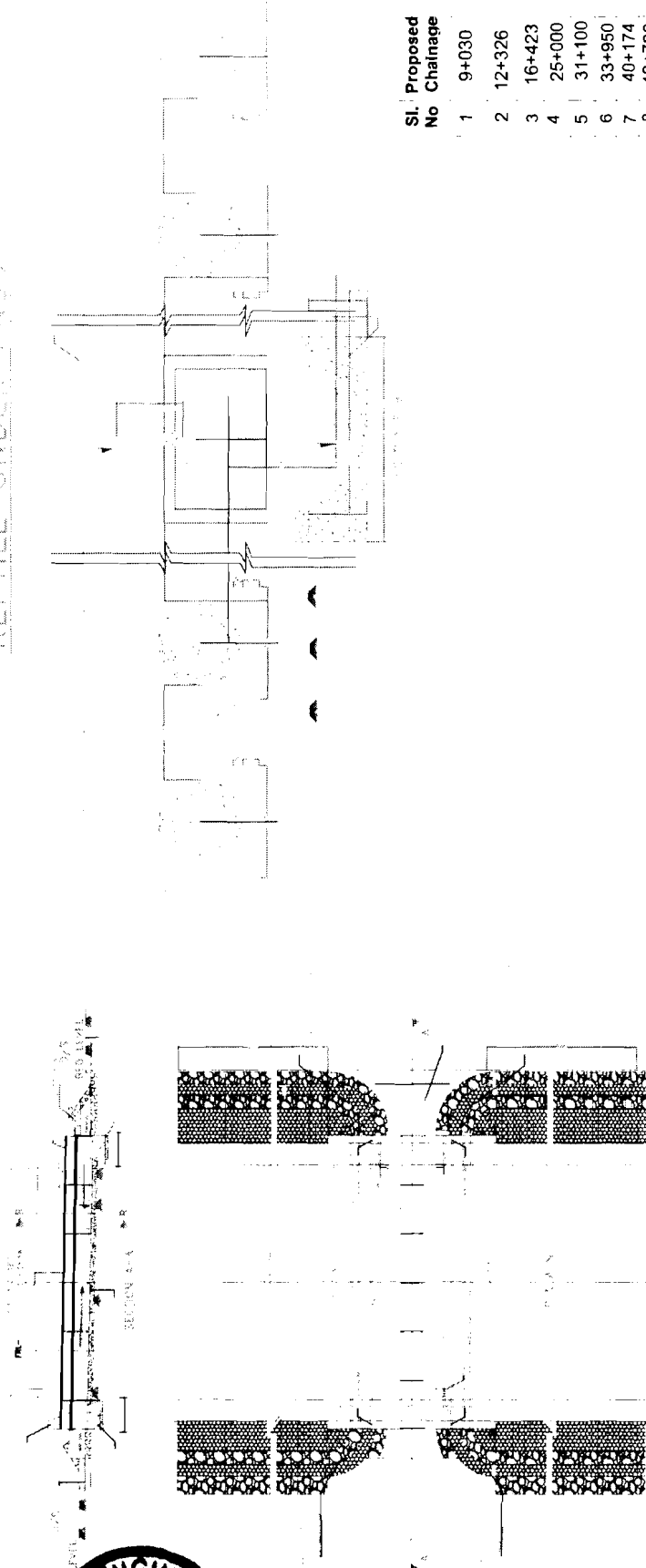
Volume-IV-Page 133 of 160

CONSULTING ENGINEERS GROUP LTD.
 E-12, Moji Colony, Malviya Nagar Jaipur-17
 Tel: +91-141-2520899, 2521899, 2520556
 Fax: 2521348, e-mail: ceg@cegingdia.com

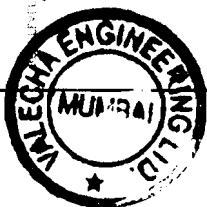
PROJECT:-
 ODISHA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE

INTERCEPTIVE BARRICADES FOR EDUCATIONAL AND MEDICAL INSTITUTIONAL APPROACHES AS ENVIRONMENTAL MITIGATION PLAN. (JAGATPUR - DUHURIA)											
DRG NO.	OSRP/CEG/JD-49KM/ENV/05					DESIGNED BY	DRAWN BY	REV.R1	APPROVED		
SH. NO.	DATE	DEC,12	REV	R-1	CEG	CEG	EE(PMU)	CE,WBP			
SCALE	NTS					CEG	CEG	EE(PMU)	CE,WBP		

REPTILE UNDER PASS



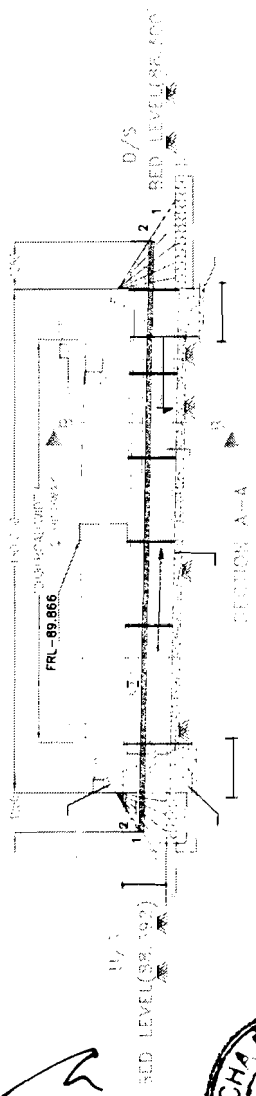
Sl. No	Proposed Chainage
1	9+030
2	12+326
3	16+423
4	25+000
5	31+100
6	33+950
7	40+174
8	43+780



VALECHA ENGINEERING LTD.
Contractor

ORISSA STATE ROADS PROJECT Works Department, Govt. of Orissa		REPTILE UNDERPASS+PIPE CULVERT (GEN.)	
DRG.NO. : CSR/ENV-14	DRAWN BY : DESIGNED BY :	REVISION-1	APPROVED
ISSUED BY :	CHECKED BY :	DATE : 12/12/12	CE W/P
PREPARED BY :	ISSUED BY :	DATE : 12/12/12	CE W/P
ORISSA STATE ROADS PROJECT Works Department, Govt. of Orissa		ORISSA STATE ROADS PROJECT Works Department, Govt. of Orissa	

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



Sl. No.	Design Change No.	Now Proposed Structure	Type of Structure
1	07/90	1x1.0	Pipe
2	19/21	2x1.0	Pipe
3	24/00	1x1.0	Pipe
4	28/00	1x1.0	Pipe
5	3/8/50	1x1.0	Pipe
6	4/3/00	1x1.0	Pipe
7	5/6/50	1x1.0	Pipe
8	6/4/50	1x1.0	Pipe
9	7/4/73	1x1.0	Pipe
10	8/2/00	1x1.0	Pipe
11	9/2/65	1x1.0	Pipe
12	10/1/00	1x1.0	Pipe
13	10/8/85	1/33/0	Skew Box
14	13/8/82	1x1.0	Pipe
15	16/6/08	2x1.0	Pipe
16	17/1/15	1x1.0	Pipe
17	17/5/00	2x1.0	Pipe
18	18/3/81	1x1.0	Pipe
19	21/0/60	1x1.0	Pipe
20	22/0/50	1x1.0	Pipe
21	22/6/48	2x1.2	Pipe
22	23/8/53	2x1.2	Pipe
23	24/4/70	2x1.0	Pipe
24	26/1/73	2x1.2	Pipe
25	26/5/50	1x1.0	Pipe
26	27/2/20	1x1.0	Pipe
27	28/7/00	1x1.0	Pipe
28	3/6/00	1x1.0	Pipe

Sl. No.	Design Change No.	Now Proposed Structure	Type of Structure
29	33/8/00	1x1.7	Pipe
30	35/0/40	1x1.2	Pipe
31	36/0/00	1x1.0	Pipe
32	37/5/80	1x1.7	Pipe
33	38/8/83	1x1.0	Pipe
34	39/7/40	1x1.2	Pipe
35	40/9/40	1x1.2	Pipe
36	41/6/80	1x1.0	Pipe
37	43/1/80	1/22/0	RCC Box
38	43/6/77	Slab Widening	Slab
39	43/7/80	1x1.0	Pipe
40	44/4/80	1x1.0	Pipe
41	45/7/00	1x1.7	Pipe
42	48/7/50	1x1.0	Pipe
43	48/8/70	1x1.0	Pipe

UTILITY DUCT PLAN

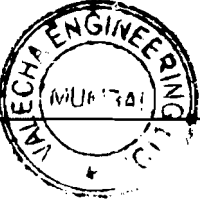
UTILITY DUCT+PIPE CULVERT (GEN.)

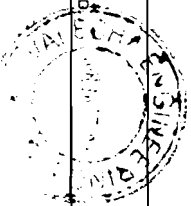
DRG NO.:	OSR/ENV-15	DESIGNED BY:	CEG	REVISION-1	APPROVED
SCALE:	N/S	DRAWN BY:	CEG	EE/PMU	CE WRP

Rev No.:	DATE: NOV/2012
----------	----------------

ORISSA STATE ROADS PROJECT
Works Department, Govt. of Orissa

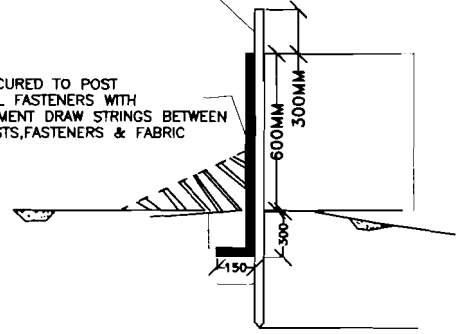
Chief Engineer,
World Bank Projects, Orissa
Employer



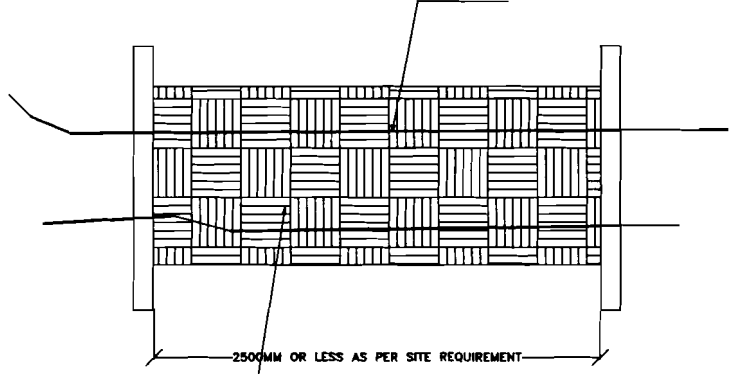


FENCE POST 75MM DIA @ 2500MM C/C

FABRIC SECURED TO POST WITH METAL FASTENERS WITH REINFORCEMENT DRAW STRINGS BETWEEN FENCE POSTS, FASTENERS & FABRIC



DRAW STRING RUNNING THROUGH FABRIC



SHEET MADE OF COCONUT FIBER WITH HDPE NETS OF WEIGHT > 600GM/SQM

SILT FENCE SEDIMENT BARRIER

NO SCALE

PROJECT:-
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

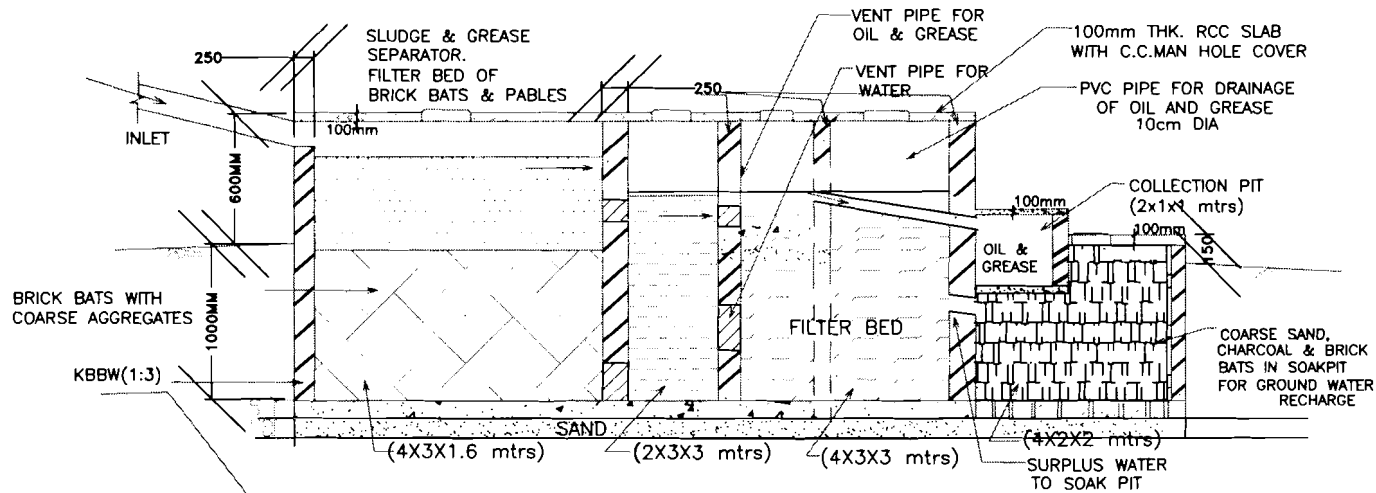
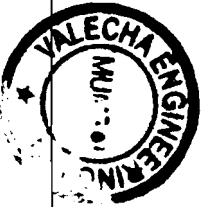
TYPICAL DRAWING FOR SILT FENCE

(JAGATPUR - DUHURIA)

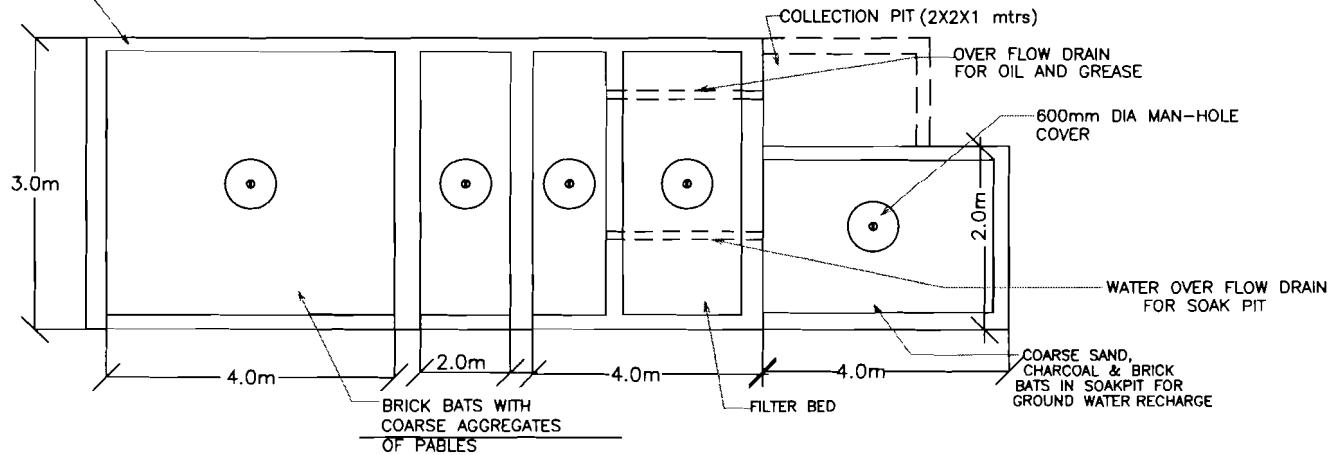
DRG NO.	OSRP/PMU/JD-49KM/ENV/01	DESIGNED BY	APPROVED
SH. NO.	DATE DEC,12 REV R-1	EE(PMU)	CE,WBP
SCALE	NTS		

Ch. Mr. P. K. Mishra
World Bank Project Employer
Via the E.I.C. (Civil), Odisha
Bhubaneswar.





SECTION OF SOAK PIT



PLAN OF SOAK PIT

NOTE: PROVIDE AT CONTRACTOR'S PLANT SITE.

OIL & GREASE TRAP FOR PLANT SITE

(JAGATPUR-DUHURIA)

DRG NO.	OSRP/CEG/ENV/06					DESIGNED BY	DRAWN BY	REV.R1	APPROVED
SH. NO.	DATE	DEC,12	REV	R-1		CEG	CEG	EE(PMU)	CE,WBP
SCALE	NTS								

PROJECT:-
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

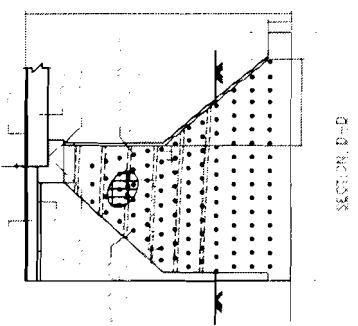
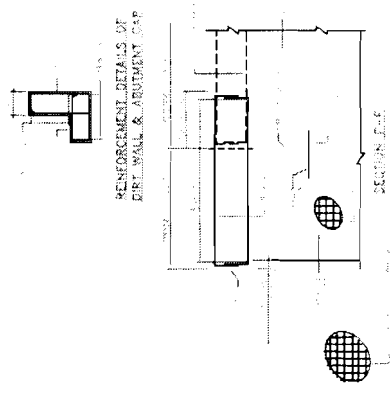
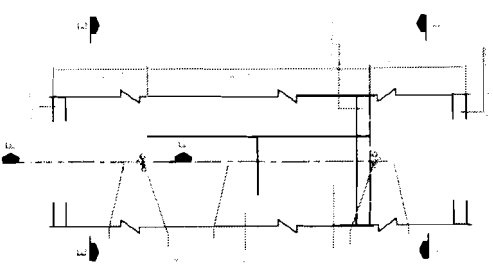
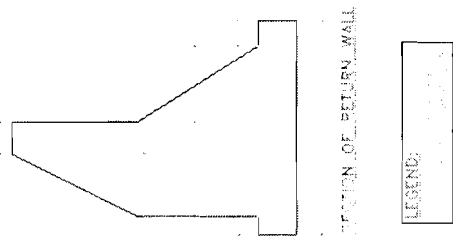
CONSULTING ENGINEERS GROUP LTD.

E-12, Moji Colony, Malviya Nagar Jaipur-17
Tel: +91-141-2520899, 2521899, 2520556
Fax: 2521348, e-mail: ceg@cegingdia.com



WIDENING OF EXISTING BRIDGES			
Sl. No	Location/Chainage	Design Span/Arrangement	Existing Span/Arrangement
1	2/145	2/10/2	5 x 8.8
2	10/400	10/5/45	1 x 8.15
3	15/900	15/8/57	1 x 8.75

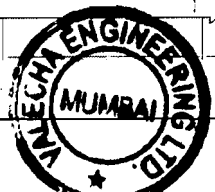
NOTES:



WIDENING METHODOLOGY FOR ABUTMENTS

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VALECHA ENGINEERING LTD.
Contractor



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

CONSULTING
ENGINEERS GROUP LTD
E-12/106, Cross-Junction, New
Tel: 2531141, 2532099, 2531891, 2532098
Fax: 2531548, E-mail: ce@venghale.com

ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

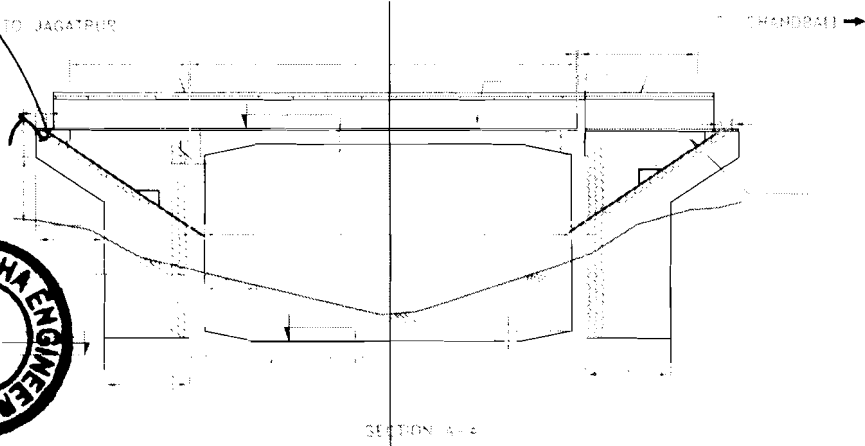
DETAILS FOR WIDENING
METHODOLOGY OF MINOR BRIDGES
(JAGATPUR - DUHURIA)

Drawing No.	Date	Scale	Revision	
			No.	Description
...

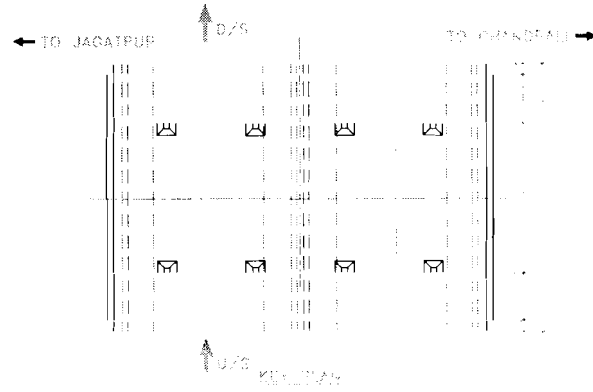
VALECHA ENGINEERING LTD
Contractor



Volume-IV Page 140 of 160



SECTION A-A

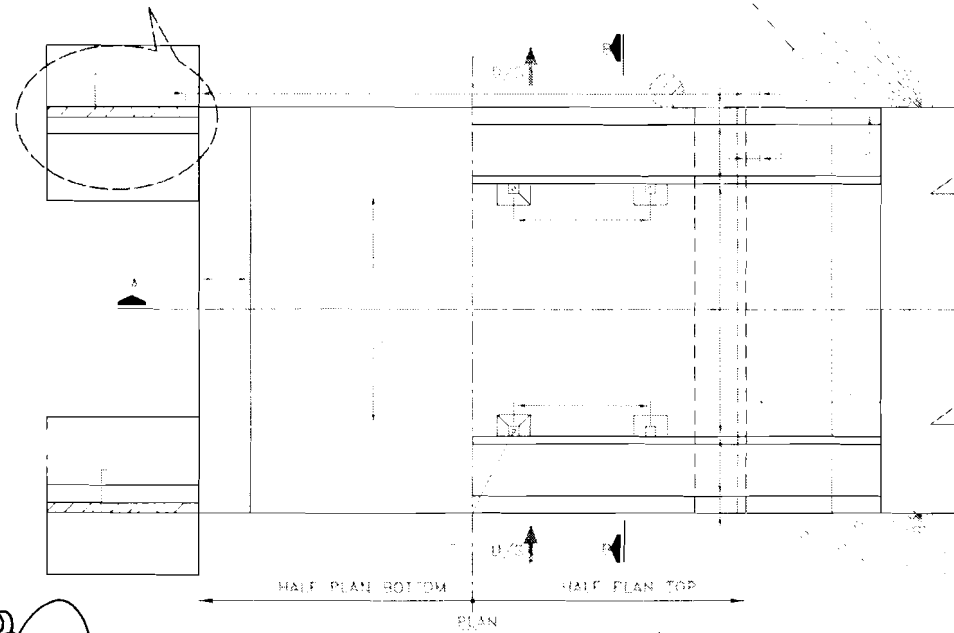


BOX LEVELS DETAILS

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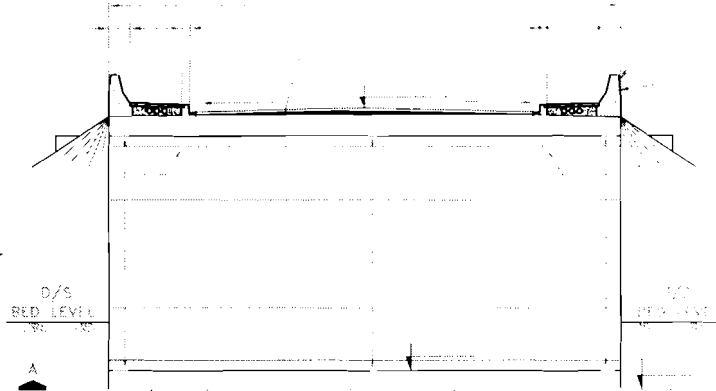
NOTES:

REVISIONS:



HALF PLAN BOTTOM HALF PLAN TOP

PLAN



SECTION B-B

HYDROLOGICAL DATA

NOTES:

LOCATION PLAN OF BORE HOLE AT BRIDGE NO.3/200

BH-1

0.00	RL 14.850
0.45	SLTY CLAY
1.20	SLTY CLAY
3.00	SLTY CLAY
4.80	SLTY CLAY
6.00	SLTY CLAY
7.20	SLTY SHED WITH CLAY
8.00	SLTY SHED WITH CLAY
10.80	SLTY SHED WITH CLAY
13.00	SLTY SHED WITH CLAY
13.80	SLTY SHED WITH CLAY
15.00	SLTY CLAY
15.90	SLTY CLAY

Over the E.I.C.(Civil), Odisha
Bhubaneswar.

Chief Engineer,
Orissa State Road Project,
World Bank Project,
Bhubaneswar.

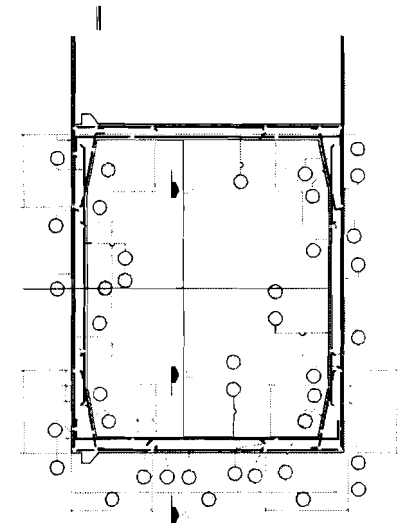
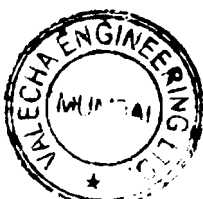
GFC CONSULTING ENGINEERS GROUP LTD.
E-12, Ma) Colony, Mahatma Nagar, Jatapur-17
Tel: +91-11-2520899, 2521899, 2520956
Fax: 2521348, e-mail: ceg@cegindia.com

PROJECT:

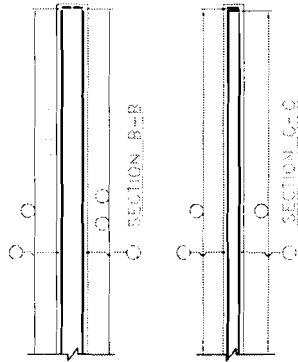
ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

GENERAL ARRANGEMENT DRAWING
BRIDGE AT PROPOSED CH. 32+06B

DRAWING NO : ORSP/CEG/46-490A/BR/32+06B/01			
DATE : NOV. 2012			
DRAWN BY	DESIGNED BY	REV. #1	APPROVED
CEG	CEG	EXT#04	CEG/PP

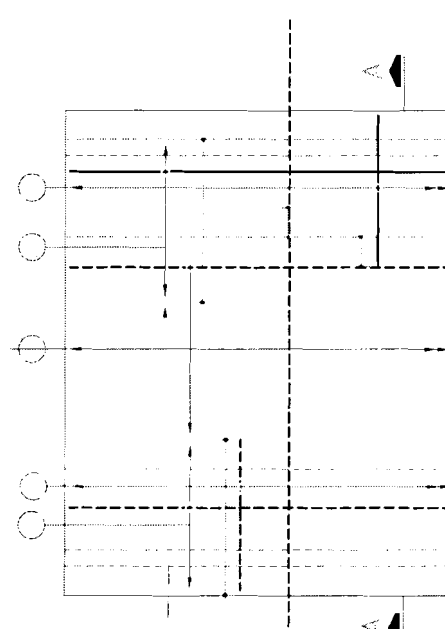


TOP PLAN



REINF. DETAILS

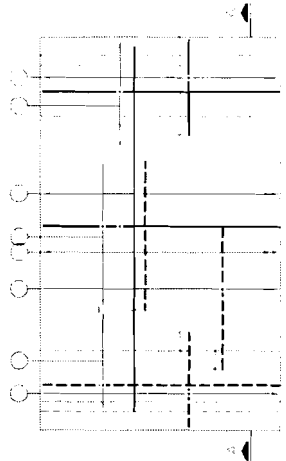
NO.	DESCRIPTION	QTY	UNIT
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17
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TOP R/F BOTTOM R/F
TOP SLAB R/F PLAN

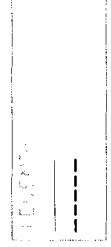
NOTES:

SECTION PREPARED:



TOP R/F

SECTION PREPARED:



ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

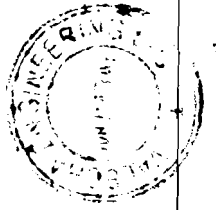
DIMENSION AND REINFORCEMENT DETAILS
SINGLE CELL R.C.C. BOX BRIDGE
(WITHOUT EARTH CUSHION)

DRAWING NO. : ORR/OSR/40-REIN/13-08/13
DATE : 10.07.13

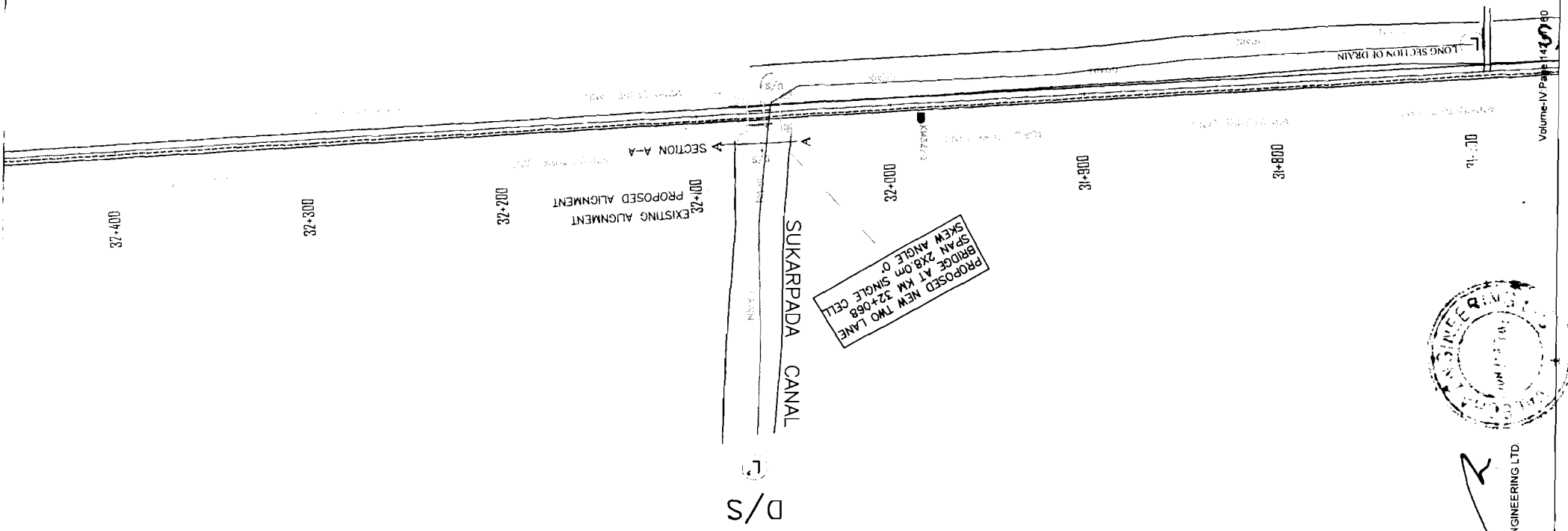
REV. NO.	REV. BY	REV. DATE	REV. DESCRIPTION

C O N S U L T I N G
ENGINEERS GROUP LTD.
12/24/3, Park Street, New Market, Cuttack
Dist. Cuttack, Orissa, India - 753003

VALECHA ENGINEERING LTD.



TO CHANDBALI



PROPOSED NEW TWO LANE BRIDGE AT KM 32+068 SKEW ANGLE 0°

SCALE = 1 : 2500

--- EXISTING ALIGNMENT
 --- PROPOSED CENTER LINE

PROJECT CENTERLINE
 EXISTING CENTERLINE
 SECTION A-A

D/S

U/S

SITE PLAN

EXISTING BRIDGE

LONG SECTION OF DRAIN

SUKRAPADA CANAL

D/S

LONG SECTION ALONG LT.

ELEVATION
 CHANGING

HOR. = 1 : 2000
 VER. = 1 : 200

DATE: 15/07/2018	SCALE: 1:2000	PROJECT: ORISSA STATE ROAD PROJECT	BRIDGE AT PROPOSED CH. 32+068
DESIGNED BY: [Signature]	CHECKED BY: [Signature]	PROJECT NO. 09P/04/01/01/01/01/01	
DATE: 15/07/2018	SCALE: 1:2000	PROJECT: ORISSA STATE ROAD PROJECT	BRIDGE AT PROPOSED CH. 32+068

ORISSA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE

CONSULTING ENGINEERS GROUP LTD.
 E-12(M) Oorissa Highway Nagar, Jajpur-75
 Ph: 2271348, E-mail: ceog@ceogindia.com

Chief Engineer
 JAGT PUR
 To the E.I.C. Chief Engineer
 Bhubaneswar.

JAGATPUR

TO CHANDBALI

NOTE:

SECTION A-A

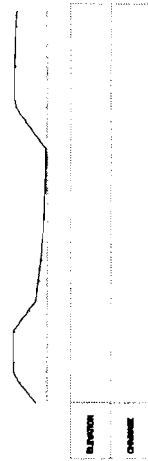
A

D/S

U/S

DETAIL PLAN

SCALE = 1 : 500



SECTION AA AT BRIDGE SITE

PROJECT:

ORISSA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

CONSULTING

ENGINEERS GROUP LTD.
E-7/2nd Colony, Jajpur Nagar, Jajpur-751008
Ph: 2531348, E-mail: ogp@ogp.com

VER.

VER. = 1 : 500
VER. = 1 : 1000

SITE PLAN

BRIDGE AT PROPOSED CH. 32+068

ORISSA STATE ROAD PROJECT (S.R.P.)

DATE	NO.	BY	FOR

ODISHA ENGINEERING LTD.

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

Contractor: VALECHA ENGINEERING LTD.



EXISTING BRIDGE DETAILS

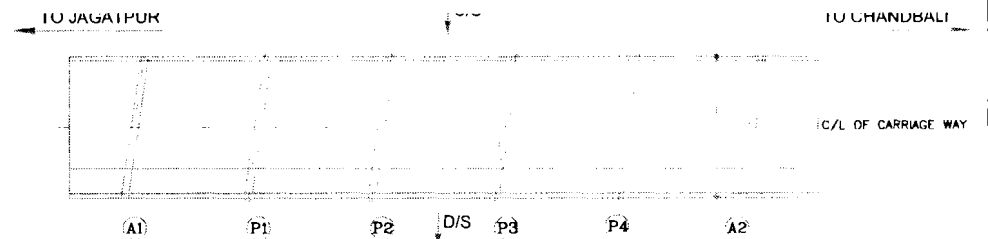
1	Existing Chainage	2/145
2	Proposed Chainage	2/082
3	Name of the nallah	Kharia Bridge Skew 13°
4	Year of construction	1995
5	Type of bridge	High level Bridge
6	Existing span arrangement	5 x 8.8 m
7	Existing carriageway width	7.6 m
8	Thickness of superstructure	0.65 m
9	Type of foundation	Open foundation
10	Type of substructure	PCC wall type
11	Type of superstructure	RCC solid slab
12	Existing Formation Level	29.664 m
13	Final Formation Level	29.664 m
14	Bed Level	20.830 m
15	Distance of PCL w.r.t ECL	0.11 m Right

NOTES:

Reinforcements must conform to Fe-500 of IS 1785

WIDENING AND REHABILITATION MEASURES SUGGESTED

S. no.	Items	Rehabilitation Measures	Reference Drawings
1	Superstructure	Existing slab shall be widened on both sides. Wearing coat shall be replaced completely.	MOST STANDARD DRAWINGS FOR ROAD BRIDGES, SD/163 (Proposed deck slab width shall be modified to 8.3 mt)
2	Substructure	Abutment & pier shall be widened and Return wall to be done	OSRP/CEG/SH-9A/BR-WID/01
3	Crash barrier	Existing railings shall be dismantled and crash barrier shall be cast	
4	Expansion joint	Expansion joint buried and shall be replaced by asphaltic plug type	
5	Wearing Coat	Wearing coat damaged and 50mm BC laid over 6mm thick mastic asphalt shall be provided	
6	Vegetation	Vegetation to be removed from the structure	



KEY PLAN

ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

REHABILITATION BRIDGE DETAILS
BRIDGE AT PROPOSED CH. 2+082

SHEET NO. : OSRP/ODJ/S-9A/BR/21/14/01			
DATE : JUN. 2013			
DRAWN BY : CCG	DESIGNED BY : CCG	CHECKED BY : CCG	APPROVED BY : CCG



World Bank Project
 under the E.C.C.(Civil), Odisha
 Chitraneswar
 Chief Engineer,
 Odisha State Road Project

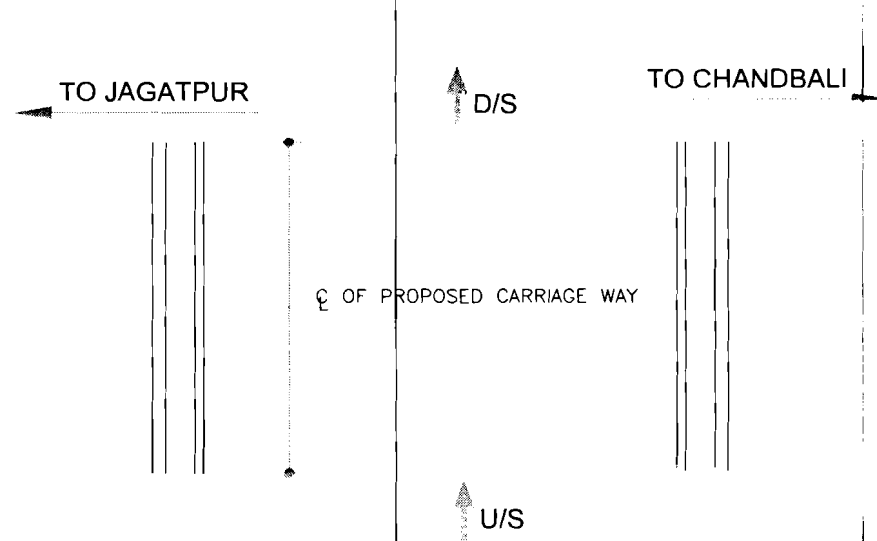


EXISTING BRIDGE DETAILS

1	Existing Chainage	10/400
2	Proposed Chainage	10/545
3	Name of the nallah	Sukhabhadra River
4	Year of construction	1991
5	Type of bridge	High level Bridge
6	Existing span arrangement	1 x 8.15 m
7	Existing carriageway width	7.3 m
	Thickness of superstructure	0.4 m
	Type of foundation	Raft foundation
	Type of structure	RCC Cell Box
11	Existing Formation Level	21.710 m
12	Final Formation Level	21.710 m
13	Bed Level	18.580 m
14	Distance of PCL w.r.t ECL	0.0 m

WIDENING AND REHABILITATION MEASURES SUGGESTED

S. no.	Items	Rehabilitation Measures	Reference Drawings
1	Superstructure	Existing slab shall be widened on both sides. Wearing coat shall be replaced completely	MOST STANDARD DRAWINGS FOR ROAD BRIDGES. SD/163 (Proposed deck slab width shall be modified to 8.3 m)
2	Substructure	Abutment & pier shall be widened and Return wall to be done	OSRP/CEG/SH-9A/BR-WID/01
3	Crash barrier	Existing railings shall be dismantled and crash barrier shall be cast	
4	Expansion joint	Expansion joint buried and shall be replaced by asphaltic plug type	OSRP/CEG/BR/MISC-02
5	Wearing Coat	Wearing coat damaged and 50mm BC laid over 6mm thick mastic asphalt shall be provided	
6	Vegetation	Vegetation to be removed from the structure	



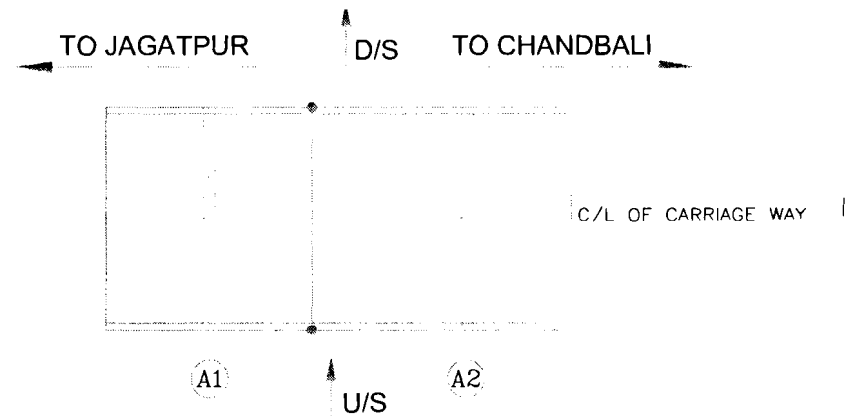


EXISTING BRIDGE DETAILS

1	Existing Chainage	15/900
2	Proposed Chainage	15/857
3	Name of the nallah	Naliamuhan Polo
4	Year of construction	1994
5	Type of bridge	High level Bridge
6	Existing span arrangement	1 x 8.75 m
7	Existing carriageway width	7.6 m
8	Thickness of superstructure	0.6 m
9	Type of foundation	Open foundation
10	Type of substructure	PCC wall type
11	Type of superstructure	RCC solid slab
12	Existing Formation Level	18.240 m
13	Final Formation Level	18.240 m
14	Bed Level	14.870 m
15	Distance of PCL w.r.t ECL	0.02 m Left

WIDENING AND REHABILITATION MEASURES SUGGESTED

S. no.	Items	Rehabilitation Measures	Reference Drawings
1	Superstructure	Existing slab shall be widened on both sides. Wearing coat shall be replaced completely	MOST STANDARD DRAWINGS FOR ROAD BRIDGES. SD/163 (Proposed deck slab width shall be modified to 8.3 mt)
2	Substructure	Abutment & pier shall be widened and Return wall to be done	OSRP/CEG/SH-9A/BR-WID/01
3	Crash barrier	Existing railings shall be dismantled and crash barrier shall be cast	
4	Expansion joint	Expansion joint burried and shall be replaced by asphaltic plug type	
5	Wearing Coat	Wearing coat damaged and 50mm BC laid over 6mm thick mastic asphalt shall be provided	
6	Vegetation	Vegetation to be removed from the structure	

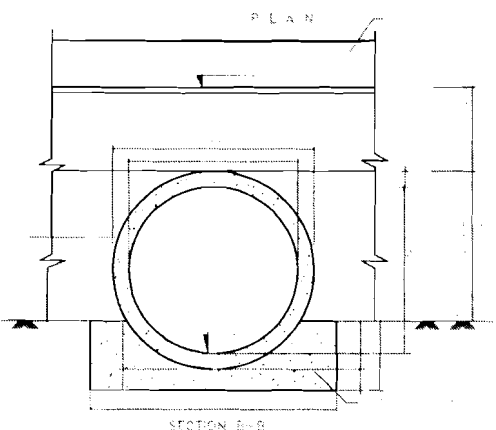
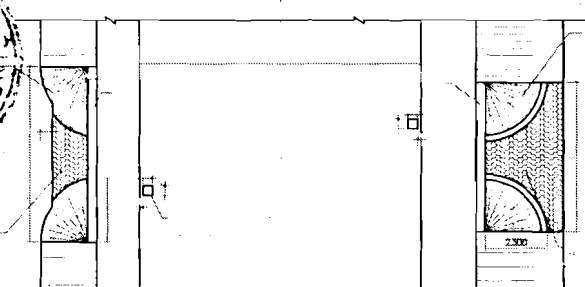
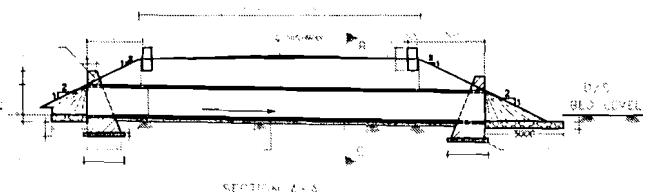


PROJECT

ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

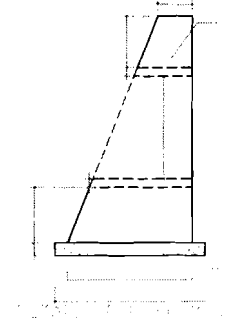
REHABILITATION BRIDGE DETAILS
BRIDGE AT PROPOSED CH. 15+857

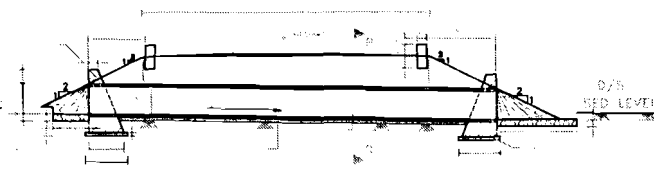
SHEET NO. : OSRP/CEG/SH-9A/BR/15+857/01			
DATE : MAY, 2012			
DESIGNED BY	CHECKED BY	REV. BY	APPROVED
CS	CS	CS	CS



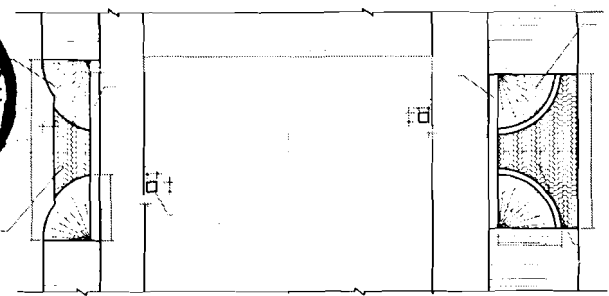
For
M. B. Singh
Manager
Engineering
Group
Rhubaneswar

Sl. No.	Proposed Chainage	Proposed Formation Level	Camber/Super Elevation		Bed level		Height of F/R		LW1: RW1	Direction of flow	Total Length	No of Pipes	U/S Approx	D/S Approx	Total Length	
			Left	Right	Left	Right	Left	Right								
			(H1)	(H2)	(H1)	(H2)	(H1)	(H2)								
1	+190	26.842	-2.5%	-2.5%	26.597	26.374	0	0	0	0	L to R	12	5	2.3	3.0	17.80
2	+390	26.782	-2.5%	-2.5%	26.858	26.885	0	0	0	0	R to L	12	5	2.3	3.0	17.80
3	+690	27.196	-2.5%	-2.5%	26.786	26.705	0	0	0	0	L to R	12	5	2.3	3.0	17.80
4	+1020	26.205	-2.5%	-2.5%	25.735	25.257	0	0	0	0	L to R	12	5	2.3	3.0	17.80
5	+1440	25.463	-2.5%	-2.5%	24.734	24.834	0	0	0	0	R to L	12	5	2.3	3.0	17.80
6	+1800	25.268	-2.5%	-2.5%	24.753	24.730	0	0	0	0	L to R	12	5	2.3	3.0	17.80
7	+2400	24.915	-2.5%	-2.5%	24.510	23.379	0	0.59	0	1.2	L to R	13.17	6	2.3	3.0	20.3
8	+2800	24.917	-2.5%	0.13%	23.556	23.194	0.4	0.93	0.82	1.9	L to R	14.68	6	2.3	3.0	20.3
9	+3120	24.876	-2.5%	-2.5%	24.173	23.021	0	0.91	0	1.8	L to R	13.81	6	2.3	3.0	20.3
10	+3360	24.841	-2.5%	-2.5%	23.350	23.201	0.5	0.69	1.08	1.4	L to R	14.46	6	2.3	3.0	20.3
11	+3850	24.771	-2.5%	-2.5%	23.851	24.006	0	0	0	0	R to L	12	5	2.3	3.0	17.80
12	+4300	23.970	-2.5%	-2.5%	23.087	22.952	0	0.07	0	0.1	L to R	12.14	5	2.3	3.0	17.80
13	+5415	24.297	-2.5%	-2.5%	23.412	21.932	0	1.42	0	2.8	L to R	14.83	6	2.3	3.0	20.3
14	+5615	24.149	-2.5%	-2.5%	23.194	22.437	0	0.76	0.01	1.5	L to R	13.54	6	2.3	3.0	20.3
15	+5875	24.030	-5.22%	-5.22%	22.846	22.161	0.7	0.76	1.39	1.5	L to R	14.91	6	2.3	3.0	20.3
16	+6151	23.904	-2.5%	-2.5%	22.771	21.885	0.2	1.07	0.37	2.1	L to R	14.5	6	2.3	3.0	20.3
17	+6345	23.815	-2.5%	-2.5%	23.043	22.494	0	0.37	0	0.7	L to R	12.74	6	2.3	3.0	20.3
18	+6450	23.767	-2.5%	-2.5%	22.649	21.446	0.2	1.37	0.34	2.7	L to R	15.08	7	2.3	3.0	22.8
19	+6800	23.606	-2.5%	-2.5%	22.610	22.367	0	0.29	0.09	0.6	L to R	12.67	6	2.3	3.0	20.3
20	+7473	23.297	-2.5%	-2.5%	22.148	21.324	0.2	1.02	0.4	2	L to R	14.45	6	2.3	3.0	20.3
21	+7850	23.124	-2.5%	-2.5%	22.371	22.003	0	0.17	0	0.3	L to R	12.34	5	2.3	3.0	17.80
22	+8200	23.683	-2.5%	-2.5%	21.325	21.313	1.4	1.42	2.82	2.8	L to R	17.66	8	2.3	3.0	25.3
23	+8367	24.011	-2.5%	-2.5%	21.258	20.671	1.8	2.39	1.1	1.8	L to R	20.39	9	2.3	3.0	27.4
24	+8660	24.170	-2.5%	-2.5%	22.628	20.834	0.6	2.39	1.18	4.8	L to R	17.96	8	2.3	3.0	25.3
25	+8840	24.249	-2.5%	-2.5%	22.368	22.093	0.9	1.21	1.86	2.4	L to R	16.27	7	2.3	3.0	22.8
27	+9265	23.253	-2.5%	-2.5%	21.595	21.619	0.7	0.68	1.42	1.4	R to L	14.78	6	2.3	3.0	20.3
28	+9900	22.088	-2.5%	-2.5%	20.542	20.159	0.6	0.98	1.19	2	L to R	15.15	7	2.3	3.0	22.8
29	+10100	21.925	-5.22%	-5.22%	21.322	20.326	0.1	0.49	0.23	1	L to R	13.2	6	2.3	3.0	20.3
30	+13820	19.432	-2.5%	-2.5%	18.611	17.849	0	0.63	0	1.3	L to R	13.27	6	2.3	3.0	20.3
31	+14064	19.747	-2.5%	-2.5%	18.642	18.390	0.2	0.41	0.31	0.8	L to R	13.12	6	2.3	3.0	20.3
32	+15230	20.462	-2.5%	-2.5%	18.167	18.647	1.3	0.87	2.69	1.7	R to L	16.42	7	2.3	3.0	22.8
33	+15400	19.793	-2.5%	-2.5%	18.372	18.364	0.5	0.48	0.94	1	L to R	13.9	6	2.3	3.0	20.3
34	+16129	18.917	-2.5%	-2.5%	18.192	18.229	0	0	0	0	R to L	12	5	2.3	3.0	17.80
35	+16352	19.003	-2.5%	-2.5%	17.725	17.542	0.3	0.51	0.66	1	L to R	13.68	6	2.3	3.0	20.3
36	+16423	19.024	-2.5%	-2.5%	18.574	17.861	0	0.21	0	0.4	L to R	12.42	5	2.3	3.0	17.80
37	+174315	18.944	-5.4%	-5.4%	17.315	17.186	1.2	0.63	2.31	1.3	L to R	15.57	7	2.3	3.0	22.8
38	+17960	18.492	-2.5%	-2.5%	17.330	17.997	0.2	0	0.42	0	R to L	12.42	5	2.3	3.0	17.80
39	+18185	18.444	-2.5%	-2.5%	18.023	18.117	0	0	0	0	R to L	12	5	2.3	3.0	17.80
40	+18381	18.388	-2.5%	-2.5%	16.712	16.646	0.7	0.59	1.45	1.2	R to L	14.64	6	2.3	3.0	20.3
41	+18800	18.278	-3.5%	3.5%	17.710	17.620	0	0.07	0	0.1	L to R	12.14	5	2.3	3.0	17.80
42	+19650	19.623	-2.5%	-2.5%	18.694	19.352	0	0	0	0	R to L	12	5	2.3	3.0	17.80
43	+21080	17.364	-2.5%	-2.5%	15.563	15.559	0.9	0.86	1.7	1.7	L to R	15.41	7	2.3	3.0	22.8
44	+21752	18.424	-2.5%	-2.5%	16.974	16.202	0.5	1.27	1	2.5	L to R	15.54	7	2.3	3.0	22.8
45	+22050	17.788	-2.5%	-2.5%	16.399	16.181	0.4	0.66	0.88	1.3	L to R	14.19	6	2.3	3.0	20.3
46	+26306	16.493	-2.5%	-2.5%	14.269	14.273	1.3	1.27	2.55	2.5	R to L	17.09	7	2.3	3.0	22.8
47	+26550	15.394	-2.5%	-2.5%	14.129	13.700	0.3	0.74	0.63	1.5	L to R	14.12	6	2.3	3.0	20.3
48	+27220	14.995	-2.5%	-2.5%	13.433	14.035	0.6	0.01	1.22	0	R to L	13.24	6	2.3	3.0	20.3
48	+27220	14.995	-2.5%	-2.5%	13.433	14.035	0.6	0.01	1.22	0	R to L	13.24	6	2.3	3.0	20.3
49	+27600	15.275	-2.5%	-2.5%	14.557	13.827	0	0.5	0	1	L to R	13	6	2.3	3.0	20.3
50	+28500	15.775	-2.5%	-2.5%	15.031	14.139	0	0.69	0	1.4	L to R	13.37	6	2.3	3.0	20.3
51	+32600	14.188	-2.5%	-2.5%	12.700	12.292	0.5	0.95	1.08	1.9	L to R	14.97	6	2.3	3.0	20.3
52	+35320	12.901	-2.5%	-2.5%	12.094	11.793	0	0.16	0	0.3	L to R	12.32	5	2.3	3.0	17.80
53	+35725	13.362	-2.27%	-2.5%	12.961	12.670	0	0	0	0	L to R	12	5	2.3	3.0	17.80
54	+36000	13.583	-2.5%	-2.5%	11.376	10.889	1.2	1.72	2.47	3.4	L to R	17.92	7	2.3	3.0	22.8
55	+37925	12.278	-2.5%	-2.5%	12.177	11.814	0	0	0	0	L to R	12	5	2.3	3.0	17.80
56	+38363	11.954	-2.5%	-2.5%	10.042	10.106	1	0.9	1.92	1.8	R to L	15.72	7	2.3	3.0	22.8
57	+39400	10.911	-2.5%	-2.5%	10.231	9.869	0	0.09	0	0.2	L to R	12.18	5	2.3	3.0	17.80
58	+41680	10.413	-2.5%	-2.5%	8.950	8.765	0.5	0.7	1.03	1.4	L to R	14.42	6	2.3	3.0	20.3
59	+43780	10.796	-2.5%	-2.5%	9.755	8.861	0.1	0.89	0.19	2	L to R	14.16	6	2.3	3.0	20.3
60	+44480	10.576	-2.5%	-0.81%	9.963	9.859	0	0	0	0	L to R	12	5	2.3	3.0	17.80
61	+44880	10.269	-2.5%	-2.5%	9.107	9.393	0.2	0	0.42	0	R to L	12.42	5	2.3	3.0	17.80
62	+45870	10.271	-2.5%	-2.5%	9.073	8.744	0.2	0.58	0.5	1.2	L to R	13.65	6	2.3	3.0	20.3
63	+46180	10.312	-2.5%	-2.5%	8.219	8.257	1.1	1.11	2.29	2.2	R to L	16.5	7	2.3	3.0	22.8
64	+47560	10.057	-3.51%	3.51%	9.211	8.450	0	1.02	0	2	L to R	14.04	6	2.3	3.0	20.3
65	+48150	9.832	-2.5%	-2.5%	7.887	8.190	1	0.69	1.99	1.4	R to L	15.38	6	2.3	3.0	20.3
66	+48400	9.923	6.49%	-6.49%	8.374	9.416	1.1	0	2.28	0	R to L	14.28	6	2.3	3.0	20.3
67	+48870	9.800	-2.5%	-2.5%	8.410	8.157	0.4	0.69	0.88	1.4	L to R	14.26	6	2.3	3.0	20.3

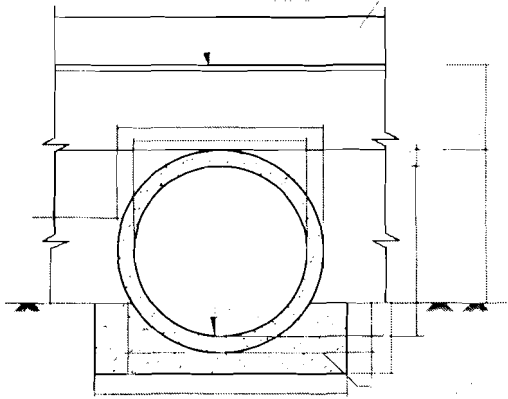




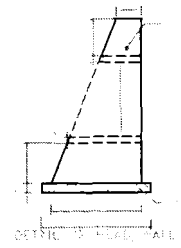
SECTION A-A



SECTION B-B



SECTION B-B



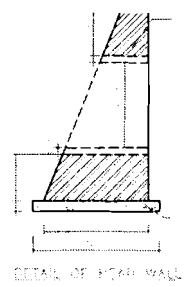
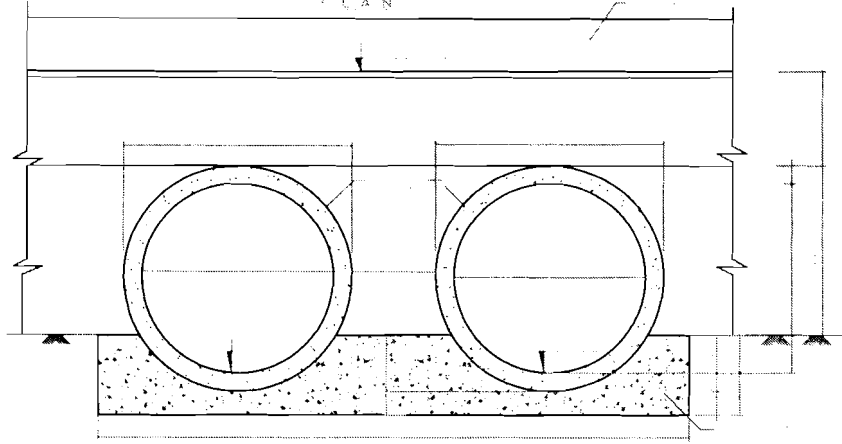
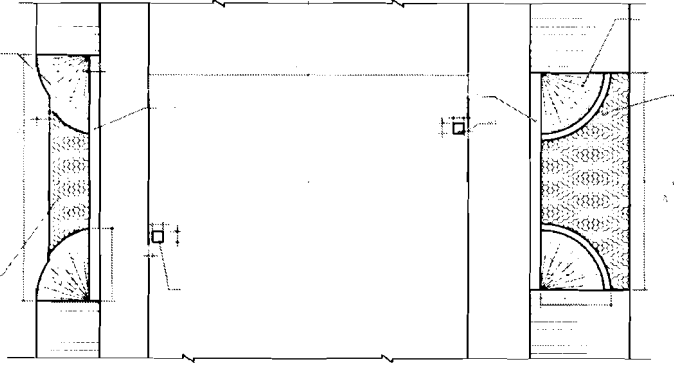
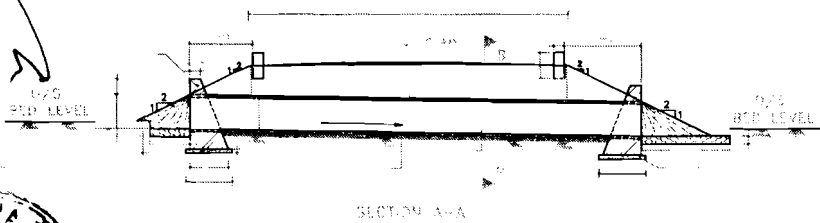
SECTION C-C

NEW SINGLE PIPE 1.2 m HPC

SL No	Proposed No. Chaining	Proposed Formation Level	Camber/Super Elevation		Bed level		Height of Fill (H/F) (M)		LW	RW	Direction of flow	Total Length	No. of Pipes	U/S	D/S	Total Apron Length
			Left	Right	Left	Right	Left	Right								
1	11+250	22.325	-2.5%	-2.5%	19.845	19.782	1.5	1.59	3.06	3.2	L to R	18.25	8	2.3	3.0	25.3
2	13+100	21.422	-2.5%	-2.5%	18.995	18.887	1.5	1.59	2.95	3.2	L to R	18.12	8	2.3	3.0	25.3
3	13+150	21.396	-2.5%	-2.5%	18.550	18.966	1.9	1.48	3.79	3	R to L	18.75	8	2.3	3.0	25.3
4	13+345	21.268	-2.5%	-2.5%	18.968	19.224	1.4	1.09	2.7	2.2	R to L	16.89	7	2.3	3.0	22.8
5	14+250	20.035	-2.5%	-2.5%	17.625	17.416	1.5	1.67	2.92	3.3	L to R	18.26	8	2.3	3.0	25.3
6	20+150	18.463	-4.86%	-4.86%	18.045	16.564	1.3	1.39	3.62	2.9	R to L	17.44	7	2.3	3.0	22.8
7	23+360	18.179	-2.5%	-2.5%	15.395	15.493	1.8	1.74	3.67	3.5	R to L	19.14	8	2.3	3.0	25.3
8	23+580	17.923	-2.5%	-2.5%	15.288	15.076	1.7	1.9	3.37	3.8	L to R	19.16	8	2.3	3.0	25.3
9	24+732	16.950	-2.5%	-2.5%	15.392	15.342	0.6	0.66	1.22	1.3	L to R	14.53	6	2.3	3.0	20.3
10	25+900	17.252	-2.5%	-2.5%	14.859	14.664	1.4	1.64	2.89	3.3	L to R	18.16	8	2.3	3.0	25.3
11	25+288	17.140	-2.5%	-2.5%	14.111	14.414	2.1	1.78	4.16	3.6	R to L	19.71	8	2.3	3.0	25.3
12	25+971	18.844	-2.5%	-2.5%	14.729	14.515	1.2	1.38	2.33	2.8	L to R	17.09	7	2.3	3.0	22.8
13	29+118	17.075	-2.5%	-2.5%	14.310	14.165	1.8	1.96	3.62	3.9	L to R	19.54	8	2.3	3.0	25.3
14	29+208	17.112	-2.5%	-2.5%	15.428	15.019	0.7	1.14	1.47	2.3	L to R	15.76	7	2.3	3.0	22.8
15	29+500	15.978	-2.5%	-2.5%	14.402	13.979	0.6	1.05	1.25	1.1	L to R	15.35	7	2.3	3.0	22.8
16	29+960	15.185	-2.5%	-2.5%	13.631	13.372	0.6	0.86	1.21	1.7	L to R	14.93	6	2.3	3.0	20.3
17	30+220	15.343	-2.5%	-2.5%	13.107	13.001	1.3	1.39	2.57	2.8	L to R	17.36	7	2.3	3.0	22.8
18	30+660	15.200	-4.06%	-4.06%	12.211	12.629	2.4	1.53	4.87	3.1	R to L	19.92	8	2.3	3.0	25.3
19	31+480	14.382	-2.5%	-2.5%	11.831	11.828	1.6	1.8	3.2	3.6	L to R	18.81	8	2.3	3.0	25.3
20	31+680	14.149	-2.5%	-2.5%	11.717	11.592	1.5	1.81	2.96	3.2	L to R	18.18	8	2.3	3.0	25.3
21	32+340	14.009	-2.5%	-2.5%	12.168	11.908	0.9	1.15	1.78	2.3	L to R	18.08	7	2.3	3.0	22.8
22	32+580	14.175	-2.5%	-2.5%	13.140	13.385	0.1	0	0.17	0	R to L	12.17	5	2.3	3.0	17.80
23	33+390	14.732	-2.5%	-2.5%	12.373	12.853	1.4	1.13	2.82	2.3	R to L	17.09	7	2.3	3.0	22.8
24	33+710	14.947	0.56%	-2.5%	12.270	12.099	1.9	1.9	3.82	3.8	L to R	19.62	8	2.3	3.0	25.3
25	33+950	14.966	-2.5%	-2.5%	12.305	12.680	1.7	1.34	3.42	2.7	R to L	18.1	8	2.3	3.0	25.3
26	34+598	14.364	-2.50%	-1.09%	11.998	11.816	1.4	1.68	2.83	3.4	L to R	18.2	8	2.3	3.0	25.3
27	35+942	13.475	-2.5%	-2.5%	11.355	11.590	1.2	0.93	2.34	1.9	R to L	16.21	7	2.3	3.0	22.8
28	36+320	13.594	-2.5%	-2.5%	11.641	11.341	1.2	1.3	2.01	2.6	L to R	16.61	7	2.3	3.0	22.8
29	36+548	13.618	-2.5%	-2.5%	11.109	10.614	1.6	2.05	3.11	4.1	L to R	19.22	8	2.3	3.0	25.3
30	37+580	12.647	-2.5%	-2.5%	10.080	9.856	1.8	2.04	3.63	4.1	L to R	19.72	8	2.3	3.0	25.3
31	39+740	11.155	-2.5%	-2.5%	11.074	10.848	0	0	0	0	L to R	12	5	2.3	3.0	17.80
32	39+940	11.499	-2.5%	-2.5%	11.931	12.011	0	0	0	0	R to L	12	5	2.3	3.0	17.80
33	40+174	11.597	-2.5%	-2.5%	9.528	9.433	1.1	1.21	2.24	2.4	L to R	16.66	7	2.3	3.0	22.8
34	40+440	11.707	-2.5%	-2.5%	9.534	9.123	1.2	1.63	2.45	3.3	L to R	17.71	8	2.3	3.0	25.3
35	40+770	11.429	-2.5%	-2.5%	10.061	9.017	0.4	1.46	0.84	2.9	L to R	15.76	7	2.3	3.0	22.8
36	40+940	11.048	-2.5%	-2.5%	9.239	8.886	0.9	1.21	1.71	2.4	L to R	16.13	7	2.3	3.0	22.8
37	41+900	10.378	-2.5%	-2.5%	8.923	9.045	0.5	0.38	1.01	0.8	R to L	13.78	6	2.3	3.0	20.3
38	42+310	10.326	-4.7%	4.7%	9.233	8.651	0	1.16	0.02	2.3	L to R	14.34	8	2.3	3.0	20.3
39	42+780	11.658	-2.5%	-2.5%	9.143	8.864	1.6	1.84	3.13	3.7	L to R	18.82	8	2.3	3.0	25.3
40	45+200	10.813	-2.5%	-2.5%	8.747	8.178	0.9	1.49	1.83	3	L to R	16.8	7	2.3	3.0	22.8
41	45+660	10.790	-2.5%	-2.5%	8.208	8.854	1.6	0.99	3.26	2	R to L	17.24	7	2.3	3.0	22.8
42	46+660	11.013	-2.5%	-2.5%	8.272	8.911	1.8	1.85	3.58	3.7	L to R	19.29	8	2.3	3.0	25.3
43	47+280	10.735	-2.5%	-2.5%	8.159	8.119	1.6	1.67	3.25	3.3	L to R	18.58	8	2.3	3.0	25.3

NOTES:

Chief Engineer
Wardha Road, Wardha
Maharashtra
Shubansuwan

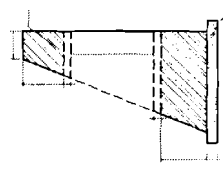
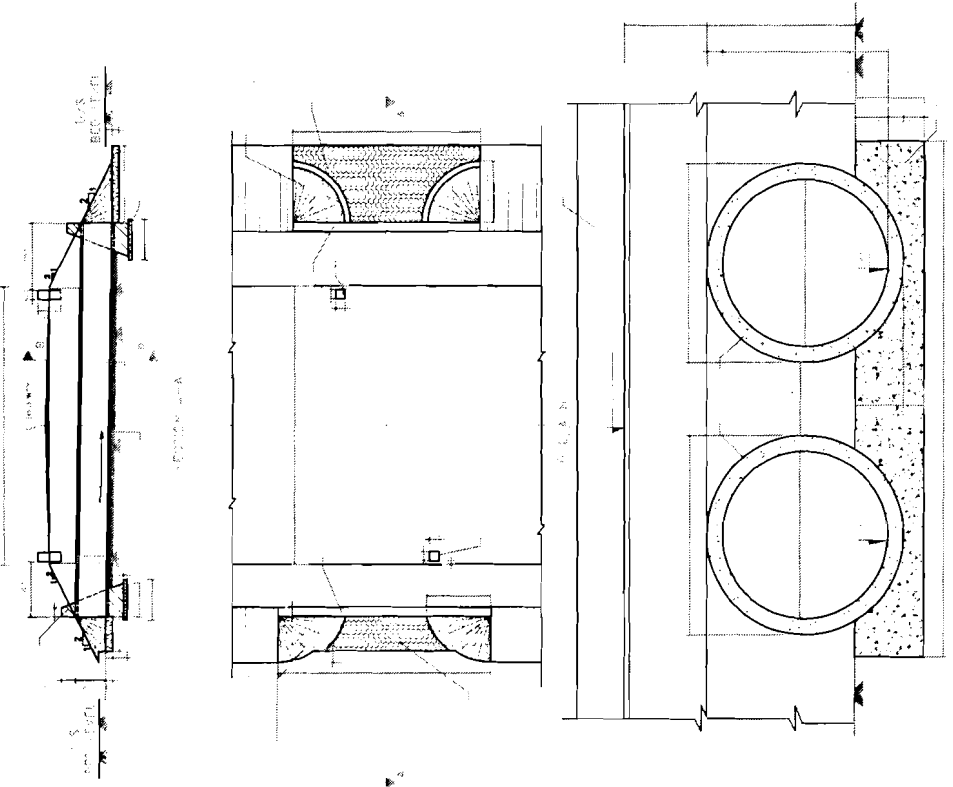


NEW DOUBLE PIPE 2x1.0 m HPC

Sl. No	Proposed Chainage	Proposed Formation Level	Camber/Super Elevation		Bed level		Height of Fill		LW1	RW1	Direction of flow	Total Length	No. of pipes	U/S Approxn	D/S Approxn	Total Length
			Left	Right	Left	Right	Left (H1)	Right (H2)								
1	1+921	26.955	0.06%	-2.5%	24.357	24.826	1.801	1.179	3.603	2.359	R to L	17.96	8	2.3	3.0	25.3
2	5+059	25.251	-2.5%	-2.5%	21.544	21.861	2.757	2.440	5.514	4.879	R to L	22.39	9	2.3	3.0	27.8
3	16+608	19.232	-2.5%	-2.5%	17.988	17.626	0.293	0.655	0.586	1.310	L to R	13.9	6	2.3	3.0	20.3
4	17+500	18.799	-2.5%	-2.5%	16.052	16.738	1.797	1.111	3.594	2.222	R to L	17.82	8	2.3	3.0	25.3
5	19+276	16.857	-2.5%	-2.5%	15.740	15.812	0.167	0.095	0.333	0.190	R to L	12.52	6	2.3	3.0	20.3
6	20+420	17.241	-2.5%	-2.5%	16.340	16.355	0.000	0.000	0.000	0.000	R to L	12	5	2.3	3.0	17.80
7	20+615	17.208	-2.5%	-2.5%	15.944	16.336	0.314	0.000	0.628	0.000	R to L	12.63	6	2.3	3.0	20.3
8	21+268	18.083	-2.5%	-2.5%	16.008	15.075	1.125	2.058	2.250	4.116	L to R	18.37	8	2.3	3.0	25.3
9	21+520	18.675	-2.5%	-2.5%	15.688	15.592	2.037	2.133	4.074	4.266	L to R	20.34	9	2.3	3.0	27.8
10	22+400	18.156	-7.0%	7.0%	17.730	17.299	0.000	0.477	0.000	0.954	L to R	12.95	6	2.3	3.0	20.3
11	24+470	16.333	-2.5%	-2.5%	14.517	14.395	0.866	0.988	1.732	1.976	L to R	15.71	7	2.3	3.0	22.8
NEW 4 x 1.0 m HPC																
12	27+100	14.689	-2.5%	-2.5%	13.659	13.352	0.08	0.39	0.16	0.774	L to R	12.93	6	2.3	3.0	20.3

NOTE: THE SPACING OF END AND INTERNAL PIPES SHALL BE AS PER THE 2 ROW PROVISION.

DESCRIPTION AS PER PU COMMENT	DATE DEC-2007	CONSULTING ENGINEERS GROUP LTD. E-12, MeJ Colony, Mahavya Nagar, Jabpur-17 Tel: +91-141-2520899, 2521899, 2520538 Fax: 2521346, e-mail: ceg@ceingr.co	Project:- ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE	TYPICAL ARRANGEMENT				DRAWING NO.: ODP/028/21-0204/001 CA-03			
	FOR R.C.C DOUBLE PIPE CULVERTS (2X1.0m DIA) (JAGATPUR - DUHURIA)				DESIGN BY	DESIGNED BY	REV BY	APPROVED CO	DESIGNER	DESIGNER	CHECKER	CLERK



NOTES:

DATE: 06-2007

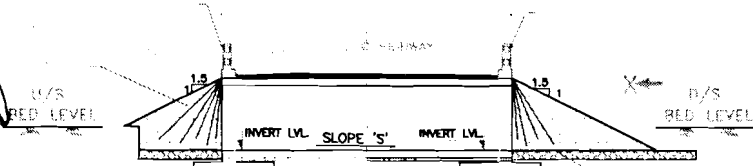
C E G
CONSULTING ENGINEERS GROUP LTD.
E-1246/1 Colony, Madhya Marg, Jodhpur-17
Tel: 491-141-2520959, 2521896, 2520534
Fax: 2521348, e-mail: ceg@cegindia.com

PROJECT:
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

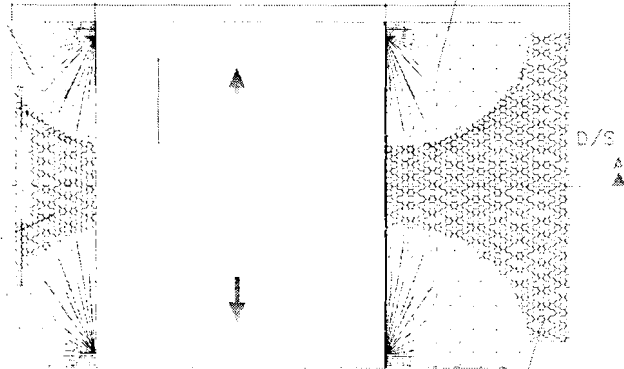
TYPICAL ARRANGEMENT
FOR R.C.C DOUBLE PIPE CULVERTS (2x1, 2m DIA)
(HEIGHT OF FILL VARYING FROM 0.6 TO 4.0 M)
(JAGATPUR - DUHURIA)

NEW DOUBLE PIPE 2x1.2 m HPC

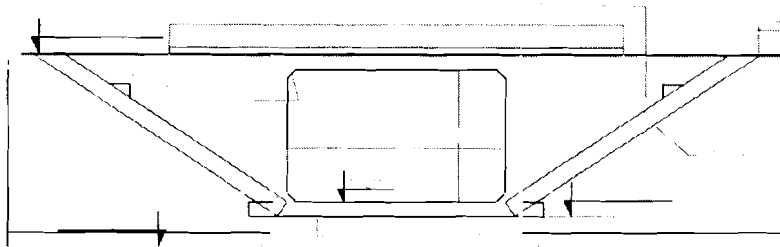
No.	Proposed Formation Level	Proposed Formation Elevation	Left	Right	Bed Level	Height of Fill	Left	Right	Direction of Flow	Total No. of Piles	U/S Apron	D/S Apron	Total Length
1	11455	21265	-2.5%	-2.5%	19823	0.97	19823	19823	L to R	8	2.3	3.0	25.3
2	11455	21265	-2.5%	-2.5%	19823	0.97	19823	19823	R to L	8	2.3	3.0	25.3
3	12470	21830	-2.5%	-2.5%	18716	0.97	18716	18716	R to L	9	2.3	3.0	26.44
4	12436	21830	-2.5%	-2.5%	18403	0.76	18403	18403	R to L	9	2.3	3.0	21.59
5	12469	21680	-2.5%	-2.5%	18251	0.90	18251	18251	R to L	8	2.3	3.0	19.34
6	14450	20247	-2.5%	-2.5%	17330	0.79	17330	17330	R to L	8	2.3	3.0	25.3
7	14450	20247	-2.5%	-2.5%	17330	0.79	17330	17330	R to L	8	2.3	3.0	25.3
8	14480	20374	-2.5%	-2.5%	17268	0.37	17268	17268	R to L	9	2.3	3.0	22.1
9	22468	18556	-2.5%	-2.5%	15438	0.66	15438	15438	R to L	6	2.3	3.0	25.3
10	22468	18556	-2.5%	-2.5%	15438	0.66	15438	15438	R to L	6	2.3	3.0	25.3
11	22468	18556	-2.5%	-2.5%	15438	0.66	15438	15438	R to L	6	2.3	3.0	25.3
12	22468	18556	-2.5%	-2.5%	15438	0.66	15438	15438	R to L	6	2.3	3.0	25.3
13	26173	16758	-2.5%	-2.5%	14068	0.96	14068	14068	R to L	8	2.3	3.0	26.3
14	34120	14762	-2.5%	-2.5%	11927	1.84	11927	11927	R to L	8	2.3	3.0	25.3
15	34120	14762	-2.5%	-2.5%	11927	1.84	11927	11927	R to L	8	2.3	3.0	25.3
16	41287	10480	-2.5%	-2.5%	9867	0.77	9867	9867	R to L	5	2.3	3.0	17.80
17	42485	10590	-2.5%	-2.5%	9920	0.83	9920	9920	R to L	6	2.3	3.0	25.3
18	44100	10716	-2.5%	-2.5%	9948	0.99	9948	9948	R to L	6	2.3	3.0	25.3
19	44100	10716	-2.5%	-2.5%	9948	0.99	9948	9948	R to L	6	2.3	3.0	25.3
20	46432	10332	-2.5%	-2.5%	8719	1.77	8719	8719	R to L	8	2.3	3.0	25.3
21	46432	10332	-2.5%	-2.5%	8719	1.77	8719	8719	R to L	8	2.3	3.0	25.3
22	47485	8969	-2.5%	-2.5%	7989	0.90	7989	7989	R to L	7	2.3	3.0	22.8



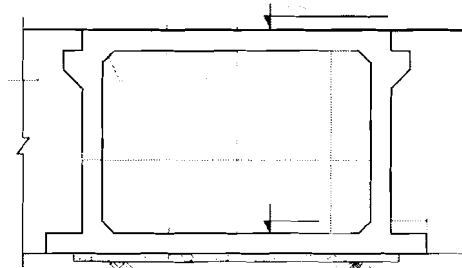
SECTION A-A



PLAN



VIEW X



DIMENSION DETAILS OF BOX

BOX/TYPE	WIDTH a (mm)	HEIGHT b (mm)	THICKNESS c (mm)	THICKNESS d (mm)	THICKNESS E (mm)	THICKNESS f (mm)	NET BEARING CAPACITY T/M ²

DESCRIPTION	DATE

CEIC
CONSULTING ENGINEERS GROUP LTD.
E-12, Me 3 Colony, Malviya Nagar, Jaipur-17
Tel: +91-141-2520899, 2521899, 2520558
Fax: 2521348, e-mail: ceic@ceicindia.com

PROJECT: ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE

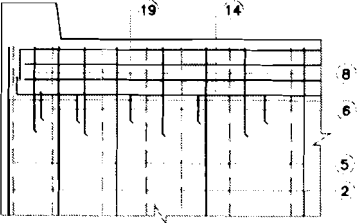
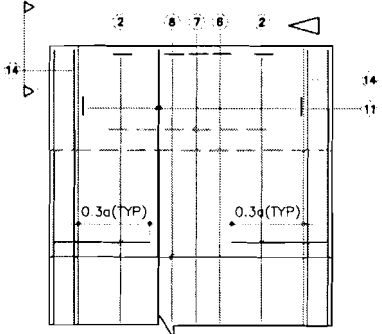
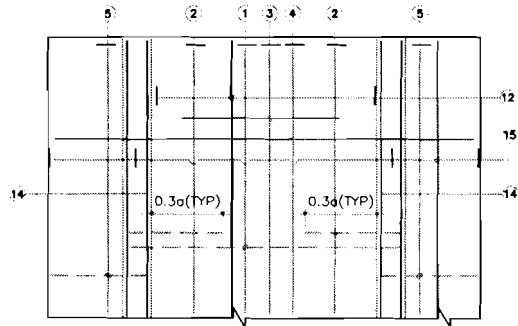
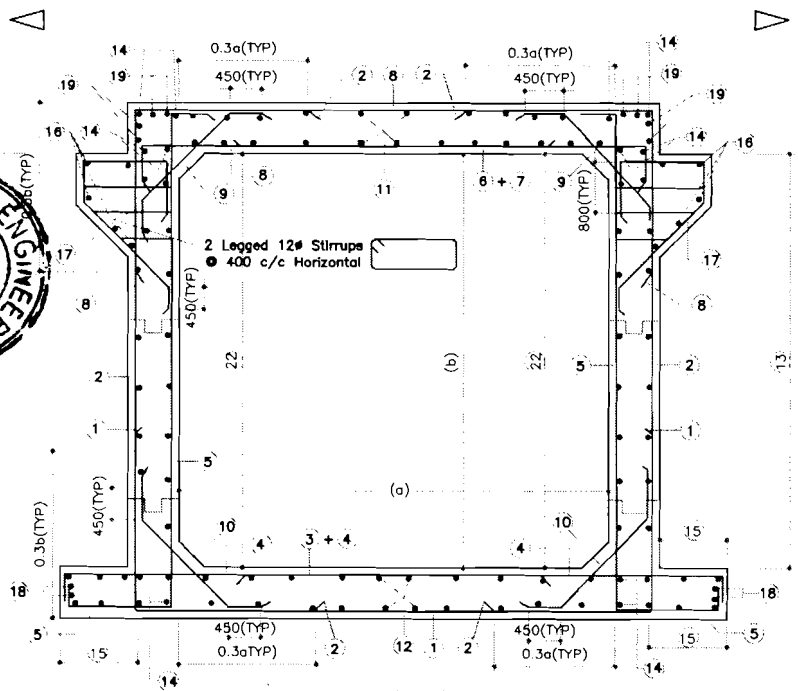
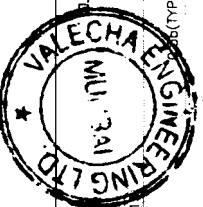
GENERAL ARRANGEMENT DRAWING
SINGLE CELL R.C.C. BOX CULVERT
(JAGATPUR - DUHURIA)

DRAWING NO. CGR/PEQ/JD-49KM/BOX/DUL-01			
DATE: NOV. 2012			
DRAWN BY	CHECKED BY	DESIGN	APPROVED

Sl. No.	Prop. Chainage	Prop. FRL	Camber		Bed Level		Direction of flow	Span	
			Left	Right	Left	Right			
1/33/0	1	10+885	22.007	-0.11%	-2.50%	19.810	19.940	R to L	3
1/22/0	2	16+886	19.278	-2.50%	-2.50%	17.880	17.900	R to L	2
1/22/0	3	24+114	16.669	5.44%	-5.44%	15.220	15.420	R to L	2
1/63/0	4	28+173	16.569	-2.50%	-2.50%	14.070	14.890	R to L	6
2/33/0	5	32+978	14.449	-2.50%	-2.50%	13.007	13.747	R to L	3
1/33/0	6	36+721	13.632	-2.50%	-2.50%	10.990	10.090	L to R	3
1/64/0	7	36+873	13.646	-2.50%	-2.50%	9.700	9.300	L to R	6
1/33/0	8	37+195	13.457	-2.50%	-2.50%	10.240	10.140	L to R	3
1/33/0	9	38+795	12.089	-2.50%	-2.50%	9.380	9.690	R to L	3
1/22/0	10	38+937	12.072	-2.50%	-2.50%	10.591	10.591	R to L	2
1/23/0	11	42+528	10.911	-2.50%	-2.50%	8.090	8.180	R to L	2
1/22/0	12	43+180	10.947	-2.50%	-2.50%	8.926	9.297	R to L	2

REFERENCED DRAWINGS

Checked by: *[Signature]*
World Bank Project
For the E.I.C. (Civil), Odisha
Bhubaneswar.



NOTES :-

- 1 ALL DIMENSIONS ARE IN MM & LEVELS ARE IN METER.
- 2 THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DRG.NO.GSRP/CEG/SH-BA/ 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 STRENGTH DEFORMED BARS OF GRADE F_y 500 CONFORMING TO IS:1786-1985
- 10 JOINT OR LAPPING OF BARS SHALL BE SUITABLY STAGGRED AS PER CLAUSE 304.6 OF IRC:21-2000.

REINFORCEMENT DRAWING

LEGEND :-

- TOP FACE BARS/OUTER FACE BARS.
- - - - BOTTOM FACE BARS/INNER FACE BARS.

BAR MARK	BAR SHAPE	1/21/0		1/23/0		1/33/0		1/34/0		1/43/0		1/44/0		1/45/0		1/43/0		1/44/0	
		BAR DIA.	SPACING	BAR DIA.	SPACING	BAR DIA.	SPACING	BAR DIA.	SPACING	BAR DIA.	SPACING	BAR DIA.	SPACING	BAR DIA.	SPACING	BAR DIA.	SPACING	BAR DIA.	SPACING
①	┌──┐	10	250	16	225	10	200	12	225	10	200	12	200	10	200	16	200	20	200
②	└──┘	18	250	16	225	16	200	16	225	20	200	20	200	20	200	20	200	20	200
③	┌──┐	18	250	18	250	12	200	12	225	12	200	12	200	12	200	20	200	20	200
④	└──┘	18	250	18	250	16	200	16	225	16	200	16	200	16	200	12	200	16	200
⑤	┌──┐	18	250	18	250	18	150	16	175	12	175	12	150	12	150	12	150	12	150
⑥	└──┘	18	250	16	250	16	200	16	225	16	200	16	200	20	200	16	200	20	200
⑦	┌──┐	18	250	16	250	16	200	16	225	8	200	8	200	12	200	16	200	16	200
⑧	└──┘	10	250	16	225	10	225	16	225	10	200	16	200	12	200	16	200	16	200
⑨	┌──┐	10	250	10	250	10	225	10	225	10	200	10	200	10	200	10	200	10	200
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⑪	┌──┐	10	250	10	250	10	225	10	225	10	200	10	200	10	200	10	150	10	150
⑫	└──┘	10	250	12	150	12	225	12	225	12	200	12	200	12	175	10	125	12	125
⑬	┌──┐	10	250	10	250	12	225	12	225	12	200	12	200	12	200	10	125	10	125
⑭	└──┘	10	250	10	250	10	225	10	225	10	200	10	200	10	200	10	150	10	150
⑮	┌──┐	10	250	12	250	10	225	12	225	10	200	10	200	10	200	10	150	10	150
⑯	└──┘	12	250	12	250	12	225	12	225	12	200	12	200	12	200	12	200	12	200
⑰	┌──┐	10	250	10	250	10	225	10	225	10	200	10	200	10	200	10	150	10	150
⑱	└──┘	10	150	10	150	10	150	10	150	10	150	10	150	10	150	10	150	10	150
⑲	┌──┐	10	250	10	250	10	250	10	250	10	250	10	250	10	250	10	250	10	250
⑳	└──┘	10	250	10	250	10	250	10	250	10	250	10	250	10	250	10	250	10	250

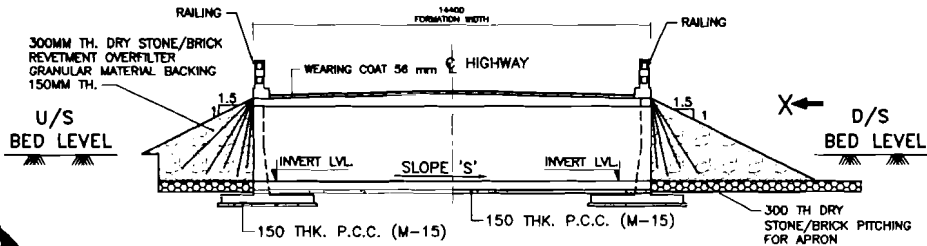
One Bank Project
World Bank Project
Jio the E.I.C (Civil), Odisha
Chubangswar.

CONSULTING ENGINEERS GROUP LTD.
E-12, (M) Colony, Mahiya Nagar, Jabpur-17
Tel: +91-141-2520899, 2521099, 2520536
Fax: 2521348, e-mail: ceg@cegindia.com

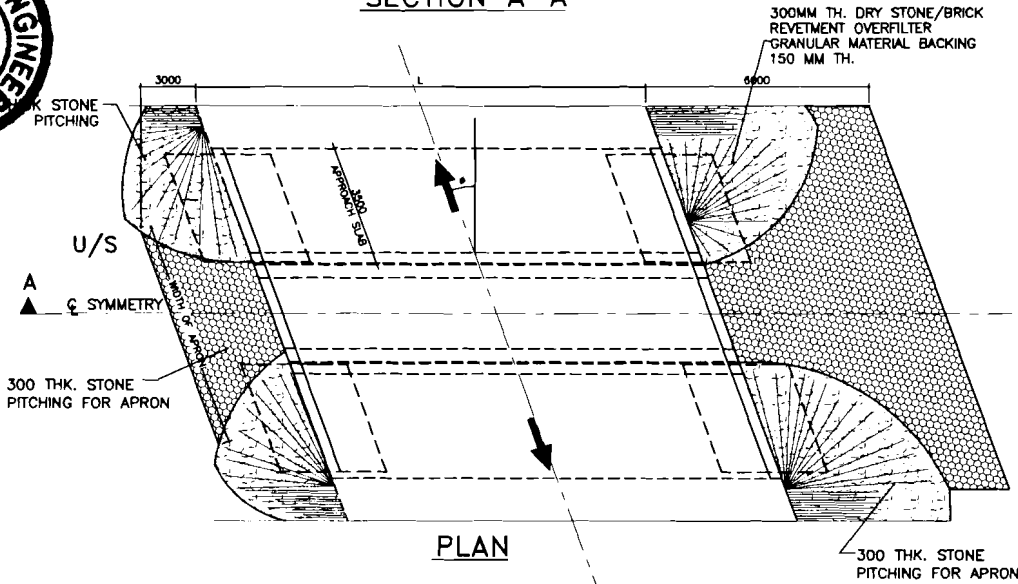
PROJECT: ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE

REINFORCEMENT DETAIL OF SINGLE CELL BOX

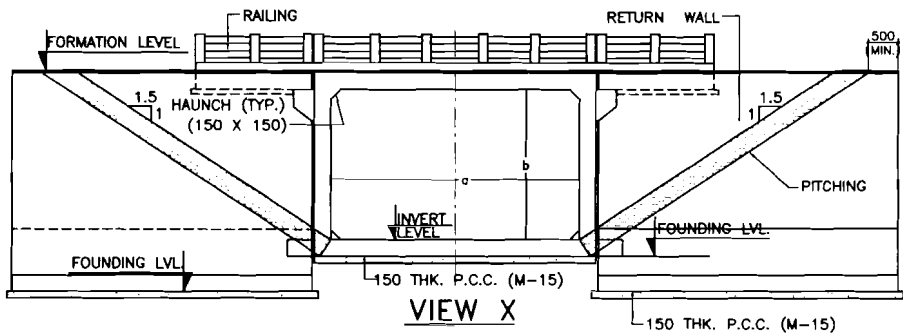
DATE: 18/07/2012	SCALE: 1/20	DRG. NO. GSRP/CEG/SH-BA/BOX CUL-02
DESIGNED BY: [Signature]	CHECKED BY: [Signature]	APPROVED BY: [Signature]
DATE: 18/07/2012	SCALE: 1/20	DRG. NO. GSRP/CEG/SH-BA/BOX CUL-02



SECTION A-A



PLAN

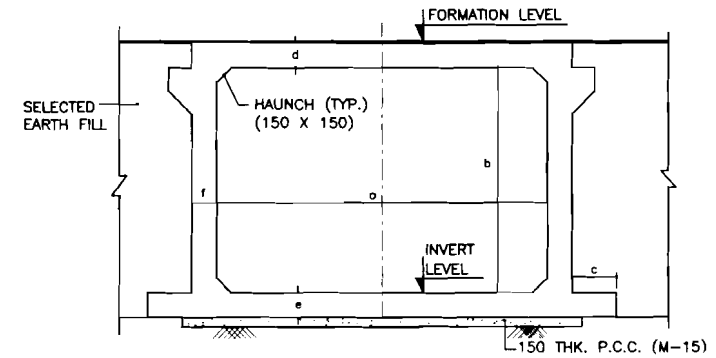


VIEW X

1. ALL DIMENSIONS ARE IN MM & LEVELS ARE IN METER.
 2. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED, DO NOT SCALE THE DIMENSIONS.
 3. LOOSE / UNSUITABLE SOIL BELOW BOX CULVERTS IS REPLACED WITH SUITABLE GRANULAR MATERIAL.
 4. IN CASE DEPTH OF EARTH FILLING BETWEEN THE TOP OF THE CULVERT AND THE BOTTOM OF THE PAVEMENT CRUST IS LESS THAN 500 MM, THIS LAYERS IS REPLACED WITH GRANULAR SUB BASE.
 5. CHAINAGE / FORMATION LEVEL IS PROVIDED AS PER APPROVED PLAN & PROFILE DRAWING.
 6. FOR CULVERTS SKEW TO THE TRAFFIC DIRECTION LENGTH OF CULVERT SHALL BE ADJUSTED AS PER SITE CONDITION.
 7. FOR REINF. DETAILS OF RETURN WALL REFER SEPARATE DRAWING.
 8. IN CASES WHERE INVERT LEVEL IS HIGHER THAN GROUND LEVEL AT ENDS OF CULVERT OR WHERE UNSUITABLE SOIL IS TO BE REPLACED BY GRANULAR MATERIAL, PROVIDE ADEQUATE CUT OFF WALLS AT ENDS OF CULVERT TO PREVENT SCOUR/EROSION.
- IN CASE ALLOWABLE SOIL BEARING CAPACITY IS LESS THAN ACTUAL BEARING PRESSURE THE SOIL SHOULD BE STABILIZED TO ACHIEVE SAME.

REFERENCE DRAWING:-

1. FOR GENERAL NOTES, MISCELLANEOUS DETAILS APPROACH SLAB, RCC RAILING, DRAINAGE SPOUT REFER MOST STANDARD DRAWING OF CULVERTS NO. SD/101, SD/115 (SHEET 1 OF 4), (SHEET 2 OF 4), (SHEET 3 OF 4), (SHEET 4 OF 4) & SD/111.
2. OSRP/CEG/SH-BA/ BOX CUL-04 (SHEET 2 OF 2)
3. OSRP/CEG/SH-BA/ BOX CUL-05
4. OSRP/CEG/SH-BA/RW/MISC-01



DIMENSION DETAILS OF BOX

TABLE SHOWING SALIENT DIMENSIONS

BOX TYPE	WIDTH a (mm)	HEIGHT b (mm)	THICKNESS c (mm)	THICKNESS d (mm)	THICKNESS e (mm)	THICKNESS f (mm)	MIN BEARING CAPACITY T _{ult} (kN/m ²)
1/22/0	2000	2000	800	380	300	300	15
1/23/0	2000	3000	1300	370	420	380	15
1/33/0	3000	3000	800	420	420	420	15
1/43/0	4000	3000	400	480	800	500	15
1/44/0	4000	4000	1200	480	950	550	15

GENERAL ARRANGEMENT DRAWING

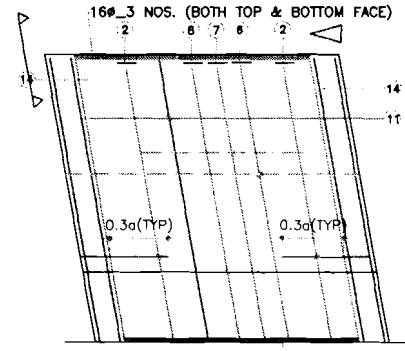
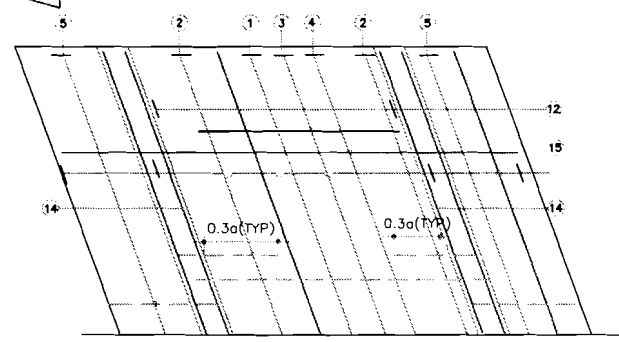
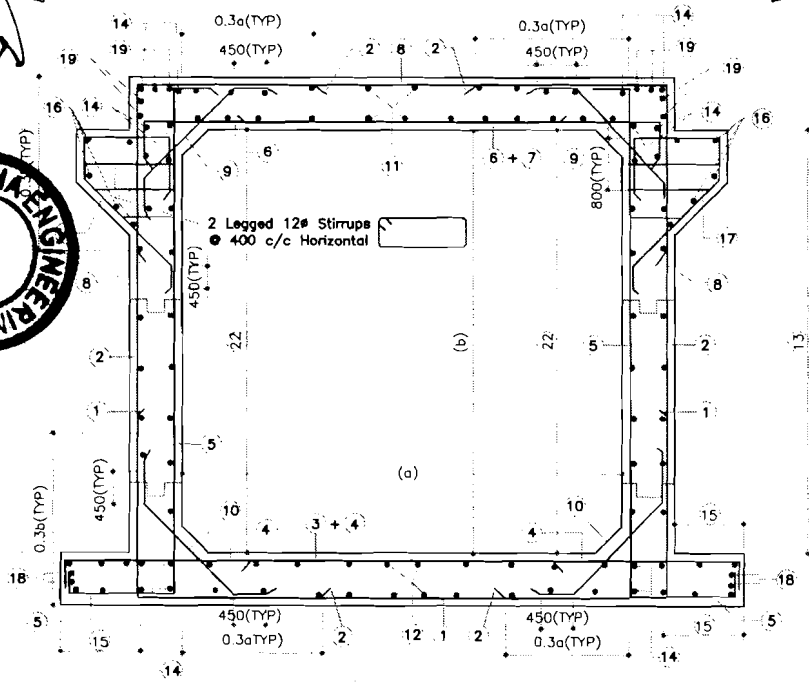
SINGLE CELL SKEW R.C.C. BOX CULVERT

DRAWING NO.: OSRP/CEG/SH-BA/ BOX CUL-04
DATE: 09/11/2007

NO.	REVISION	DATE	APPROVED

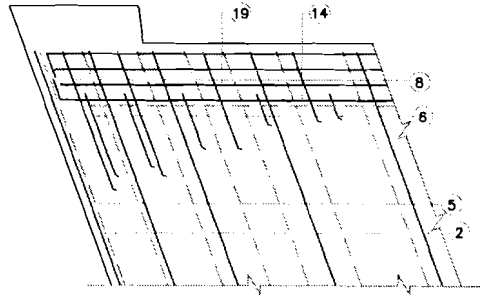
CONSULTING ENGINEERS GROUP LTD.
E-12, Midl Colony, Mohaya Nagar, Jabpur - 17
Tel: +91-141-2320899, 2321899, 2320258
Fax: 2321344, e-mail: ceg@vsnl.com

PROJECT: CONSULTANCY SERVICES FOR FEASIBILITY STUDY AND DETAILED PROJECT PREPARATION OF PHASE - (I) ROADS FOR ORISSA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE



LEGEND :-
 ——— TOP FACE BARS/OUTER FACE BARS.
 - - - - - BOTTOM FACE BARS/INNER FACE BARS.

- NOTES :-**
- 1 ALL DIMENSIONS ARE IN MM & LEVELS ARE IN METER.
 - 2 THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DRG.NO.OSRP/CEG/SH-9A BOX CUL-04
 - 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 STRENGTH DEFORMED BARS OF GRADE Fe 500 CONFORMING TO IS: 1786-1985
 - 10 JOINT OR LAPPING OF BARS SHALL BE SUITABLY STAGGRED AS PER CLAUSE 304.6 OF IRC:21-2000.



BAR MARK	BAR SHAPE	1/22/0		1/23/0		1/33/0		1/34/0		1/43/0		1/44/0		1/45/0		1/83/0		1/84/0		
		BAR DIA.	SPACING	BAR DIA.	SPACING	BAR DIA.	SPACING	BAR DIA.	SPACING	BAR DIA.	SPACING	BAR DIA.	SPACING	BAR DIA.	SPACING	BAR DIA.	SPACING	BAR DIA.	SPACING	
1	10	250	16	225	10	200	12	225	10	200	12	200	10	200	12	200	16	200	20	200
2	16	250	16	225	16	200	16	225	20	200	20	200	20	200	20	200	20	200	20	200
3	16	250	16	225	16	200	16	225	16	200	16	200	16	200	16	200	16	200	16	200
4	16	250	16	225	16	200	16	225	16	200	16	200	16	200	16	200	16	200	16	200
5	16	250	16	175	12	150	16	175	12	150	12	150	12	150	12	150	12	150	12	150
6	16	250	16	250	16	200	16	225	16	200	16	200	16	200	16	200	16	200	16	200
7	16	250	16	225	10	200	16	225	10	200	16	200	16	200	16	200	16	200	16	200
8	16	250	16	225	10	225	10	225	10	200	10	200	10	200	10	200	10	200	10	200
9	12	250	12	250	10	225	10	225	10	200	10	200	10	200	10	200	10	200	10	200
10	10	250	10	250	10	225	10	225	10	200	10	200	10	200	10	200	10	150	10	150
11	10	250	10	250	10	225	10	225	10	200	10	200	10	200	10	200	10	150	10	150
12	10	250	10	150	12	225	12	225	12	200	12	200	12	200	12	175	10	125	12	125
13	10	250	10	250	12	225	12	225	12	200	12	200	12	200	12	200	10	125	10	125
14	10	250	10	250	10	225	10	225	10	200	10	200	10	200	10	200	10	150	10	150
15	10	250	10	250	10	225	10	225	10	200	10	200	10	200	10	200	10	150	10	150
16	12	250	12	250	12	225	12	225	12	200	12	200	12	200	12	200	12	200	12	200
17	10	250	10	250	10	225	10	225	10	200	10	200	10	200	10	200	10	150	10	150
18	10	250	10	250	10	225	10	225	10	200	10	200	10	200	10	200	10	150	10	150
19	10	250	10	250	10	225	10	225	10	200	10	200	10	200	10	200	10	150	10	150
20	10	250	10	250	10	225	10	225	10	200	10	200	10	200	10	200	10	150	10	150
21	10	250	10	250	10	225	10	225	10	200	10	200	10	200	10	200	10	150	10	150
22	10	250	10	250	10	250	10	250	10	250	10	250	10	230	10	200	10	180	10	170

Project Engineer
 Mr. B. B. Mishra
 1/6 the E.I. (Civil), O.I.S.R.
 Bhubaneswar.

CEG CONSULTING ENGINEERS GROUP LTD.
 E-12, Waj Colony, Mahiya Nagar, Jabpur-17
 Tel: +91-141-2520890, 2521899, 2520556
 Fax: 2521348 e-mail: ceg@cegin.co.in

PROJECT: ODISHA STATE ROAD PROJECT UNDER WORLD BANK ASSISTANCE

REINFORCEMENT DETAIL OF SINGLE CELL SKEW BOX

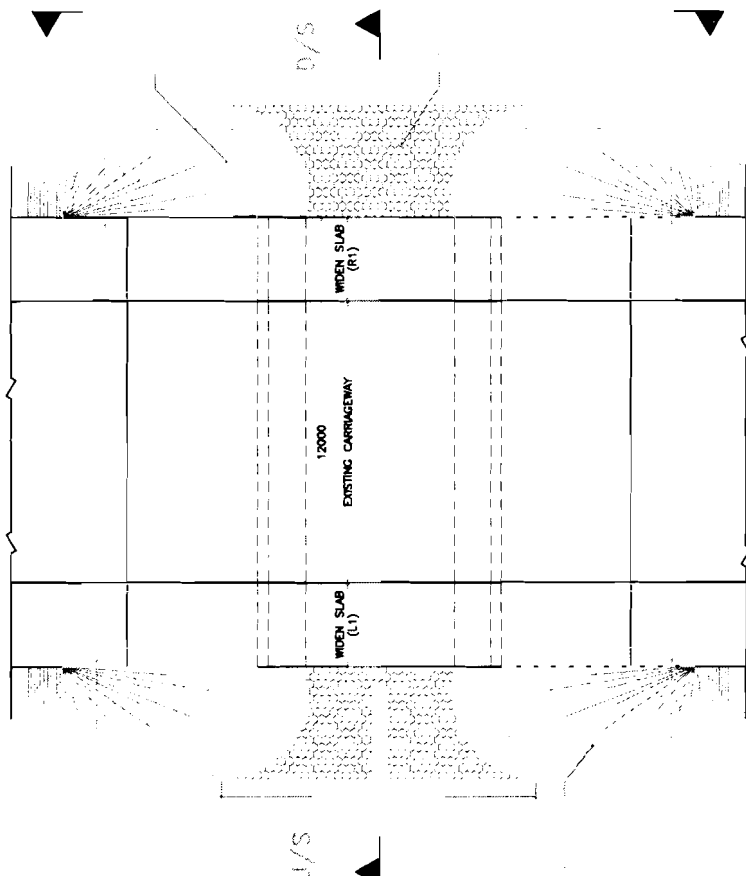
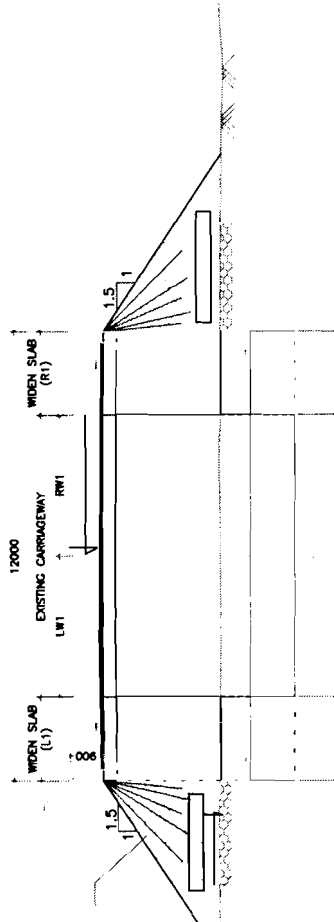
DRAWING NO. OSRP/CEG/JD-1490M BOX CUL-03	DATE: 08/11/2017	SCALE: 1/40
DESIGNED BY: [Signature]	CHECKED BY: [Signature]	APPROVED BY: [Signature]
DATE: 08/11/2017	DATE: 08/11/2017	DATE: 08/11/2017

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 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

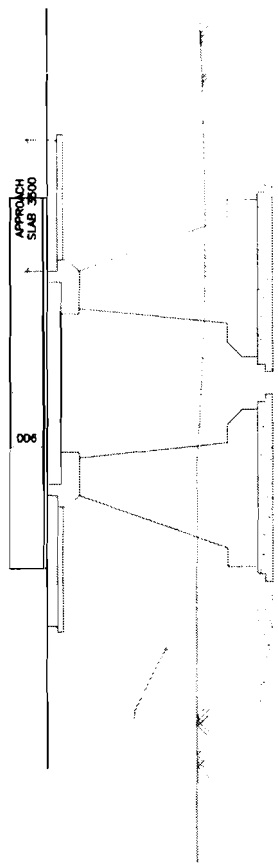
CSRP/CEG/ID-49KM/SLAB CUL/M-02

1 CSRP/CEG/ID-49KM/SLAB CUL/M-02

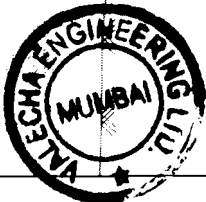


SLAB RR EXTENSION

Sl. No.	Existing Location	Proposed Chainage	Existing Span	Proposed Formation Level	Camber/Super Elevation		Bed level/Invert Level		Clear Height	Direction of flow	Total Length to be widened	Length of Return wall			
					Left	Right	Left	Right				Left	Right		
1	19938	369	1 x 17.5	19.005	2.5%	-2.5%	17.52	18.372	1.6	4.9	5.7	3.0	3.3	3.0	
2	43673	847	1 x 2.0	11.010	-2.5%	-2.5%	10.118	10.366	1.9	4.1	4.2	3.0	3.0	3.9	3.4



VALECHA ENGINEERING LTD. Contractor



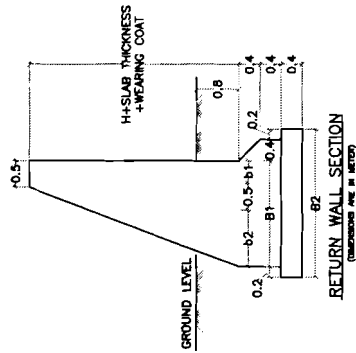
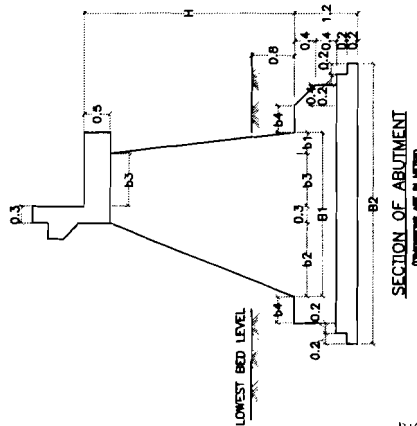
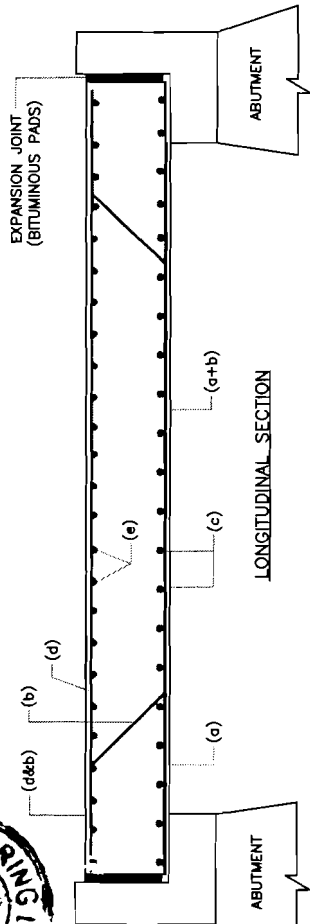
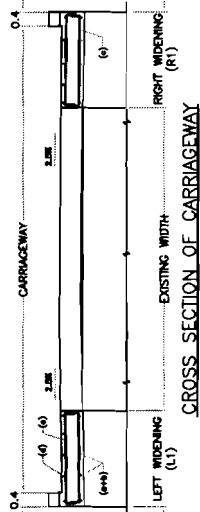
Chief Engineer,
World Bank Project Odisha
Rhubaneswar.

CEG
CONSULTING ENGINEERS GROUP LTD.
E-12/1st Cross, 4th Stage, Bannerghatta
Bangalore - 560075
Tel: 2511141, 2511142, 2511143
Fax: 2511144, 2511145

ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

GENERAL ARRANGEMENT DRAWING
TYPICAL WIDENING FOR EXISTING
SLAB CULVERTS

Checked by:
Drawn by:
Scale:
Date:
Sheet No:
Project No:
Drawing No:
Revision:
Author:
Date:
Checked by:
Date:
Scale:
Drawing No:
Revision:
Author:
Date:



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 500.
- 4 SUB STRUCTURE SHALL BE IN CONCRETE GRADE M-15 WITH SURFACE REINFORCEMENT #8 @200C/C BOTHWAYS.

DATE: 15/08/2024

1 OSRP/CE6/JD-410M/SLAB GUL/W-01

TABLE OF DIMENSIONS FOR RETURN WALL

SPAN	UPTO 2 METRES				3 METRES				4 METRES			
	1.50	2.00	2.50	3.00	1.50	2.00	2.50	3.00	1.50	2.00	2.50	3.00
H	1.50	2.00	2.50	3.00	1.50	2.00	2.50	3.00	1.50	2.00	2.50	3.00
b1	0.18	0.23	0.28	0.33	0.43	0.19	0.24	0.29	0.44	0.19	0.24	0.29
b2	0.45	0.57	0.70	0.82	0.95	1.07	1.21	1.33	1.46	1.58	1.71	1.84
B1	1.13	1.30	1.48	1.65	1.83	2.00	2.15	2.33	2.49	2.65	2.83	2.99
B2	1.93	2.10	2.28	2.45	2.65	2.80	2.95	3.10	3.25	3.40	3.55	3.70

TABLE OF DIMENSIONS FOR ABUTMENT

Effective Span	6m and 5m				3m, 2m, 1.5m and 1m				3.5m and 4m			
	2.0m	2.5m	3.0m	3.5m	1.5m	2.0m	2.5m	3.0m	1.5m	2.0m	2.5m	3.0m
H	2.0	2.5	3.0	3.5	1.5	2.0	2.5	3.0	1.5	2.0	2.5	3.0
b1	0.2	0.25	0.3	0.35	0.4	0.15	0.2	0.25	0.4	0.15	0.2	0.25
b2	0.8	0.85	1.0	1.2	1.4	0.5	0.7	0.95	1.1	1.25	1.4	1.5
b3	1.0	1.0	1.0	1.0	0.5	0.5	0.5	0.5	0.5	1.0	1.0	1.0
b4	-	0.1	0.2	0.4	0.5	-	0.1	0.2	0.3	0.5	-	0.1
B1	2.1	2.4	2.8	2.85	3.1	1.45	1.7	2.0	2.4	2.8	1.95	2.2
B2	3.3	3.8	4.2	4.85	5.3	2.85	2.9	3.4	3.8	4.2	4.8	5.3

REINFORCEMENT TABLE FOR SLAB DIMENSIONS
CONCRETE M-25, STEEL Fe-515

Clear span (m)	M A I N S L A B				K E R B S			
	a	b	c	d	e	f	g	h
1.0	210	18	280	180	180	10	300	430
2.0	260	18	280	180	180	10	300	460
3.0	320	18	240	180	180	10	300	540
4.0	380	20	280	180	180	10	300	600
5.0	430	20	240	180	180	10	300	650
6.0	480	20	220	180	180	10	300	710

ODISHA STATE ROAD PROJECT
LUDDER WORLD BANK ASSISTANCE

CONSULTING ENGINEERS GROUP LTD.
E-12(A) Colony, Jajpur, Jagatpur-17
Tel: 491-141-2520889, 2521889, 2520956
Fax: 2521345, e-mail: ce@cegroupindia.com

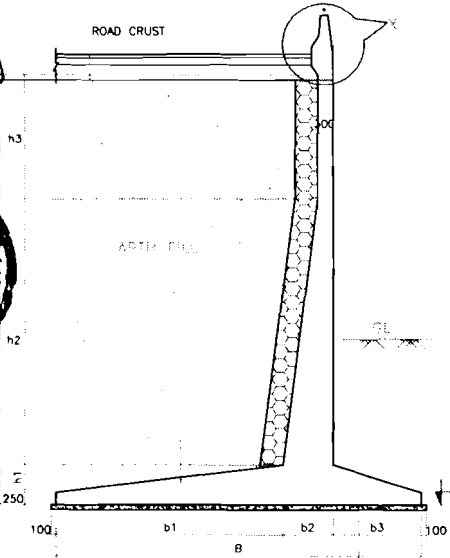
PROJECT:

DIMENSION & REINFORCEMENT
DETAIL OF SLAB & ABUTMENT

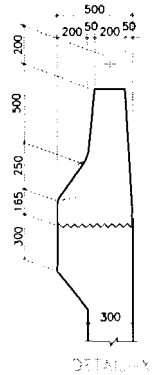
DATE	NO.	BY	CHECKED BY	APPROVED BY
15/08/24	01	SHUBHANEESHWAR	SHUBHANEESHWAR	SHUBHANEESHWAR



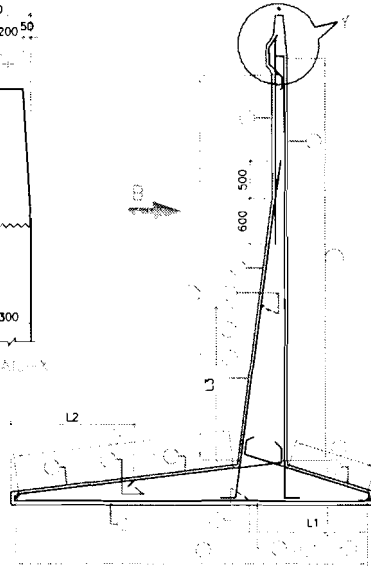
ROAD CRUST



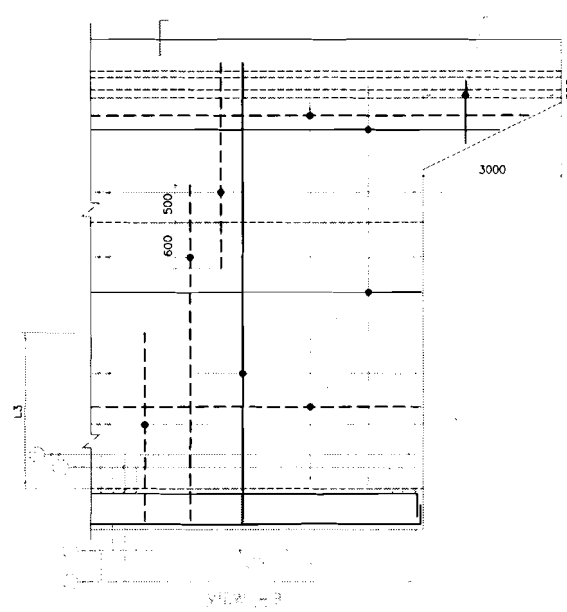
CROSS SECTION OF RETURN WALL



DETAIL-X



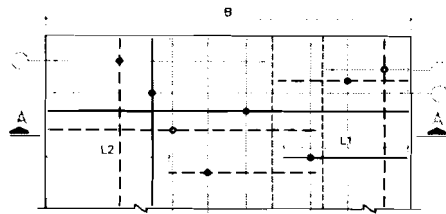
SECTION A-A



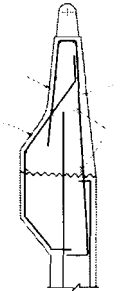
REINFORCEMENT VIEW

NOTES

4. OSRP/CEG/JD-49KM/BR/3+200/01
5. OSRP/CEG/JD-49KM/BR/3+900/01
6. OSRP/CEG/JD-49KM/BR/6+050/01



PLAN SHOWING REINFORCEMENT IN BASE PAFT



DETAIL-Y

LENGTH OF CURTAILMENT

DIMENSIONAL DETAILS

REINFORCEMENT DETAILS

LEGENDS:

Chief Engineer
 World Bank Project
 D/o the E.I.C. (WB)
 Bhubaneswar

CONSULTING ENGINEERS GROUP LTD.
 F-12, 1st Floor, Colony, Mohakhola, Bhubaneswar-751017
 Tel: +91-141- 2520899, 2521809, 2520556
 Fax: 2521348, E-Mail: ceg@cegroup.com

PROJECT: ODISHA STATE ROAD PROJECT
 UNDER WORLD BANK ASSISTANCE

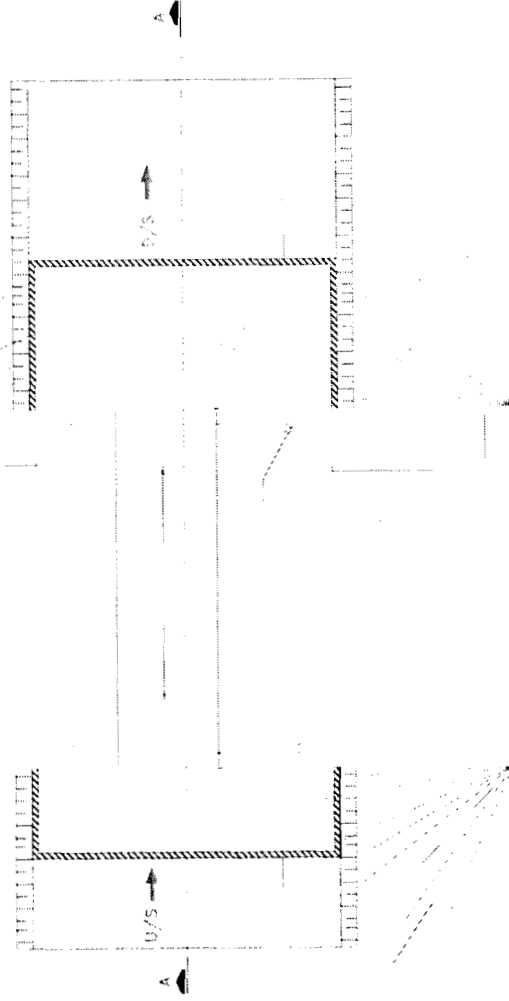
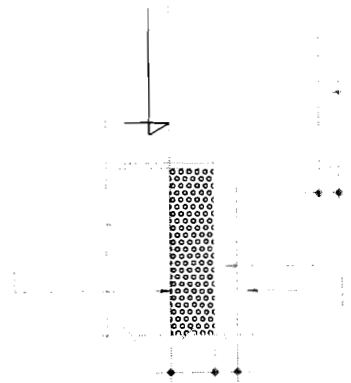
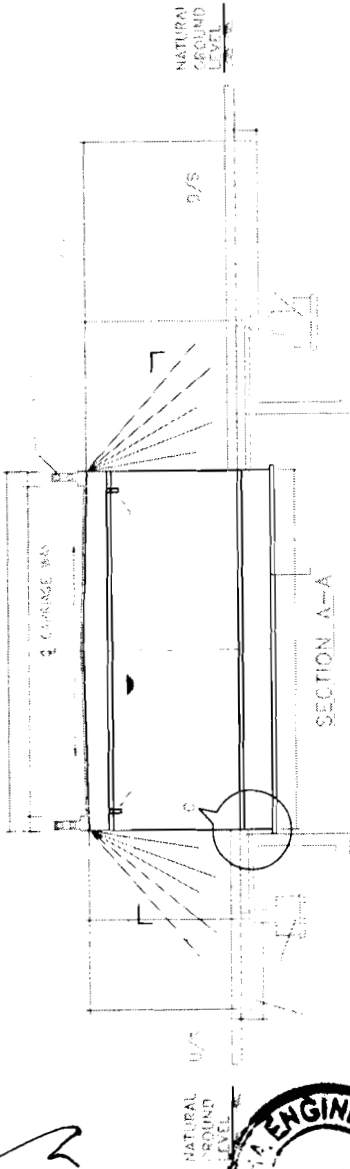
DIMENSION & REINFORCEMENT
 DETAILS OF RETURN WALL

DRAWING NO. : OSRP/CEG/JD-49KM/BR/MSC-02			
DATE : NOV, 2011			
DRAWN BY	DESIGNED BY	REV#1	APPROVED
CS	CS	ZZHAP	CE,SRP

NOTES

1. ALL DIMENSIONS ARE IN MM.
2. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. DO NOT SCALE THE DIMENSIONS.
3. APPROX MAY BE LIMITED AS PER AVAILABILITY OF LAND & DIRECTED BY THE ENGINEER.

1. OSRP/CEC/JD-49KM/BR/SCW/D1
2. OSRP/CEC/JD-49KM/BR/32+075/01



PLAN

VALECHA ENGINEERING LTD.
Contractor



Chief Engineer,
World Bank Project,
Bhubaneswar.

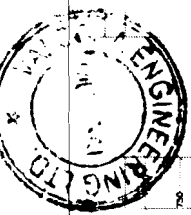
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DESIGNED BY	CEC	CHECKED BY	CEC	REVISED	REVISION
GENERAL ARRANGEMENT DRAWING					
TYPICAL DETAILS OF FLOOR PROTECTION WORKS					

ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

FOR CONSULTING ENGINEER'S USE ONLY
To be filled by the Consultant
Date: _____

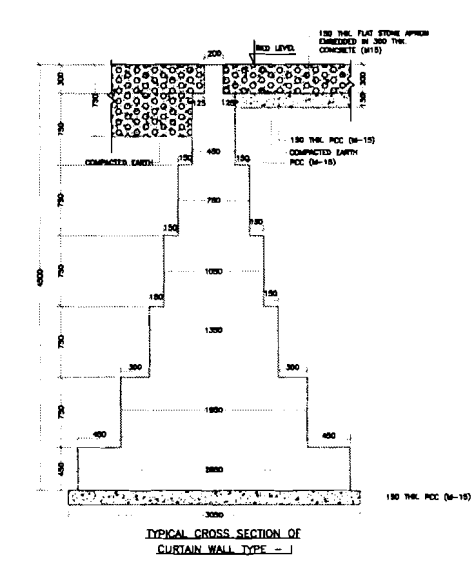
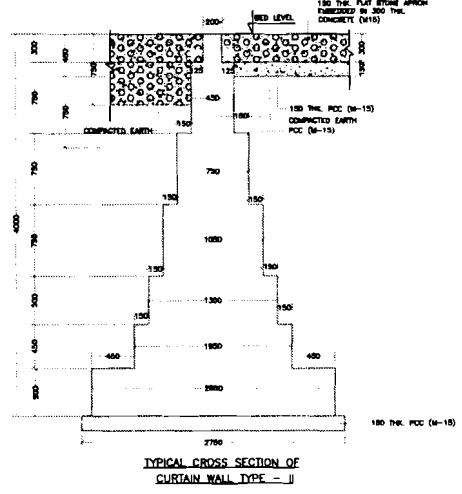
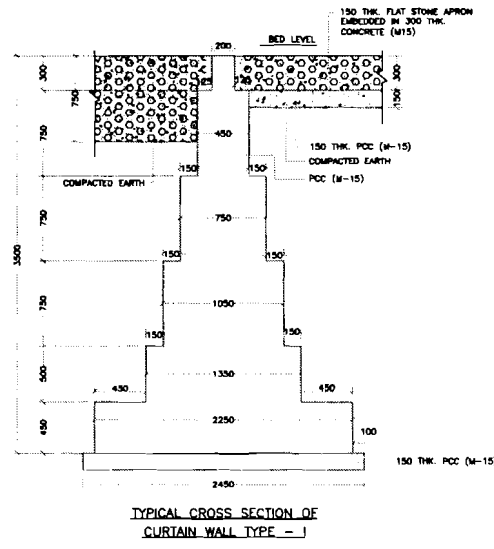
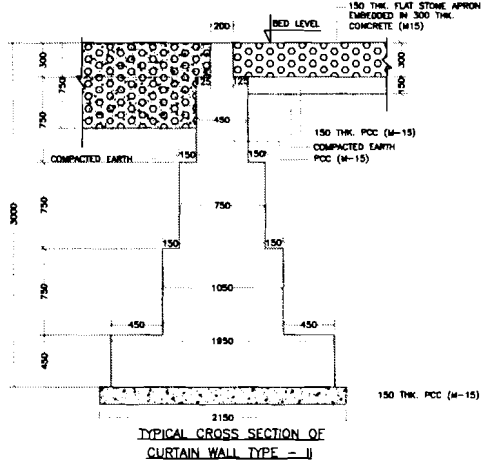
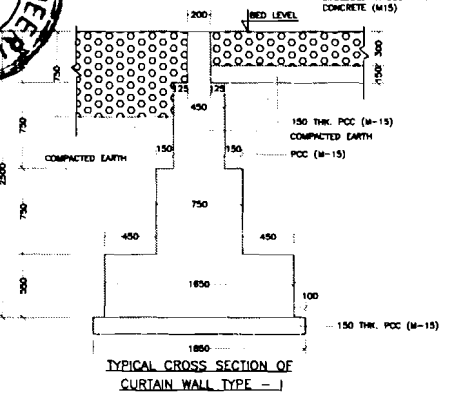
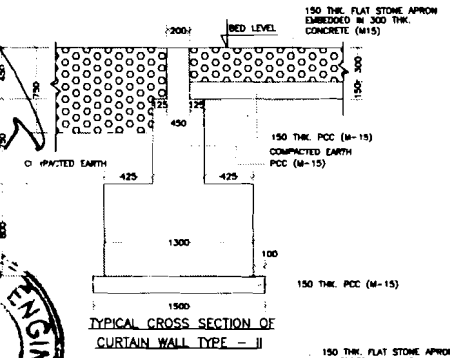
Signature of Chief Engineer

VALECHA ENGINEERING LTD.
Contractor

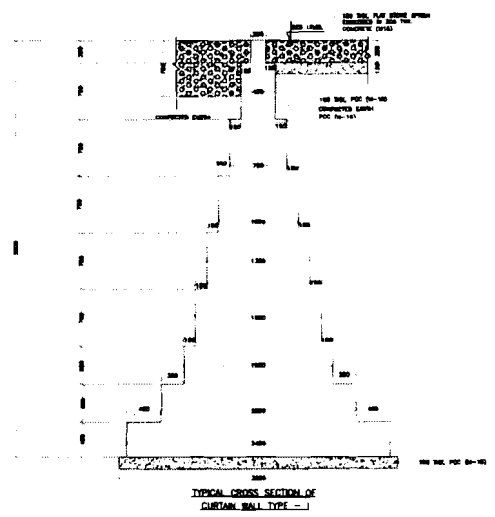
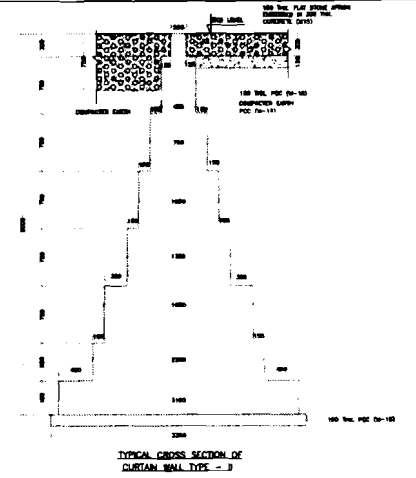


Volume IV, Page 160 of 160

Chief Engineer
Ward Bahadur
D/o the E.I.C. (Civil), Odisha
Bhubaneswar.



REFERENCE DRAWING:
OSRP/CEG/JD-49KM/BR/FPW/01
1. OSRP/CEG/JD-49KM/BR/32+075/01



PROJECT:
ODISHA STATE ROAD PROJECT
UNDER WORLD BANK ASSISTANCE

GENERAL ARRANGEMENT DRAWING
TYPICAL SECTIONS OF CURTAIN WALL

DRAWING NO. : OSRP/CEG/JD-49KM/BR/32W/01			
DATE : NOV/2012			
DRAWN BY	DESIGNED BY	REVISED BY	APPROVED
CEG	CEG	EXTP&D	CLMP



GOVERNMENT OF ODISHA
WORKS DEPARTMENT

CIVIL WORKS CONTRACT

[PACKAGE No. OSRP- CW-ICB-P04A]

For

*Widening & Strengthening of existing carriageway to 2-lane road from
Jagatpur to Duhuria (Km. 0/0 to Km. 49/0 of MDR)*

under

Odisha State Roads Project

between

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

and

M/s Valecha Engineering Ltd.,
Valecha Chambers, 4th Flkoor, Plot No. –B-6,
New Link Road, Andheri (W), Mumbai

[VOLUME-V : SCHEDULES]

Agreement Value: Rs. 151,30,58,562

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

Dated: 23rd September, 2013

CONTENTS of CONTRACT

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

CONTENTS of VOLUME V

Sl.	Description	Page No.
1	Grand Summery of Price Schedule	1
2	Daywork Summery	2
3.	Price Schedule	3-37

M/s Valecha Engineering Lt
Contractor



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: Widening & Strengthening of existing carriageway to 2-lane road from Jagatpur to Duhuria (Km. 0/0 to Km. 49/0 of MDR)
- ICB Package OSRP-CW-ICB-P04A

Contract No.: Agreement No. 11 of 2013 - 14


<i>General Summary</i>	<i>Page</i>	<i>Amount</i>
BILL NO.1 : SITE CLEARANCE	1 to 2	5,606,550.00
BILL NO.2 : EARTH WORKS	3 to 4	246,709,267.00
BILL NO.3 : SUB-BASE AND BASE COURSES	5	280,133,200.00
BILL NO.4 : BITUMINOUS COURSES	6 to 7	615,480,428.00
BILL NO.5 : CULVERTS AND UNDERPASSES	8 to 11	105,713,995.00
BILL NO.6 : BRIDGES	12 to 16	24,564,209.00
BILL NO.7 : RETAINING WALL, DRAINAGE AND PROTECTIVE WORKS	17 to 18	90,788,340.00
BILL NO.8 : ROAD SAFETY AND AMENITIES	19 to 24	103,549,166.00
BILL NO.9 : MAINTENANCE, REPAIR AND REHABILITATION	25	15,633,720.00
BILL NO.10 : ENVIRONMENTAL MITIGATION MEASURES	26 to 28	44,417,799.00
Subtotal of Bills	(A)	1,532,596,674.00
Total for Daywork (Provisional Sum)	(B)	701,422.70
Total Bid Price (A + B)	(C)	1,533,298,096.70
Discount @1.32% on Total Bid Price (C) (1.32% Discount shall be effected in each Work Bill)	(D)	20,239,534.88
Final Bid Price (C-D)	(E)	1,513,058,561.82
	Say,	1,513,058,562.00

Rupees One Hundred Fifty One Crores Thirty Lakhs Fifty Eight Thousand Five Hundred Sixty Two Only

M/s Valecha Engineering Ltd.
Contractor



Volume-V: Page 1 of 37


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

Daywork Summary

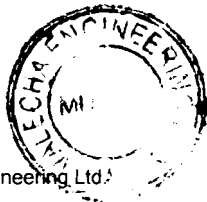
Contract Name: Widening & Strengthening of existing carriageway to 2-lane road from Jagatpur to Duhuria (Km. 0/0 to Km. 49/0 of MDR)
- ICB Package OSRP-CW-ICB-P04A

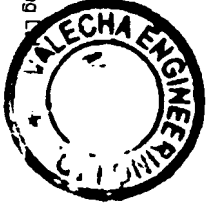
Contract No.: Agreement No. 11 of 2013 - 14

	<i>Amount (Rs.)</i>	<i>% Foreign</i>
1. Total for Daywork: Labour	114,125.00	NIL
2. Total for Daywork: Materials	378,817.70	NIL
3. Total for Daywork: Contractor's Equipment	208,480.00	NIL

Total for Daywork (Provisional Sum) 701,422.70

(carried forward to Bid Summary, p.1)





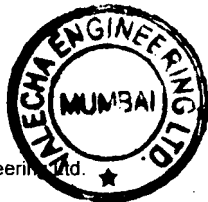
Contract Name: Widening & Strengthening of existing carriageway to 2-lane road from Jagatpur to Duhuria (Km. 0/0 to Km. 49/0 of MDR)
ICB Package OSRP-CW-ICB-P04A

PRICE SCHEDULE (Works Items & Dayworks)

Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
BILL NO.1 : SITE CLEARANCE					
1.01	Cleaning and Grubbing for road land complete as per Technical Specification Clause 201 and as per the direction of Engineer.	Hectare	69.00	30000.00 Rupees Thirty Thousand Only	2,070,000.00 Rupees Twenty Lakhs Seventy Thousand 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	912.00	250.00 Rupees Two Hundred Fifty Only	228,000.00 Rupees Two Lakhs Twenty Eight Thousand 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	217.00	300.00 Rupees Three Hundred Only	65,100.00 Rupees Sixty Five Thousand One Hundred Only
	ii)R.C.C.	Cum	121.00	320.00 Rupees Three Hundred Twenty Only	38,720.00 Rupees Thirty Eight Thousand Seven Hundred Twenty Only
	c) Dismantling all types of Pavement course	Cum	21103.00	140.00 Rupees One Hundred Forty Only	2,954,420.00 Rupees Twenty Nine Lakhs Fifty Four Thousand Four Hundred Twenty Only
	d) Hume pipe	Lm	358.00	400.00 Rupees Four Hundred Only	143,200.00 Rupees One Lakh Forty Three Thousand Two Hundred Only

Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
	e) CC Kerb	Lm	23.00	200.00 Rupees Two Hundred Only	4,600.00 Rupees Four Thousand Six Hundred Only
	f) Dry stone pitching	Cum	121.00	450.00 Rupees Four Hundred Fifty Only	54,450.00 Rupees Fifty Four Thousand Four Hundred Fifty Only
	g) Expansion joint	Lm	75.00	100.00 Rupees One Hundred Only	7,500.00 Rupees Seven Thousand Five Hundred Only
	h) Bituminous Concrete Wearing Course	Sqm	338.00	120.00 Rupees One Hundred Twenty Only	40,560.00 Rupees Forty Thousand Five Hundred Sixty Only
	Total for Bill No. 1 Carried forward to Summary				
					5,606,550.00 Rupees Fifty Six Lakhs Six Thousand Five Hundred Fifty Only

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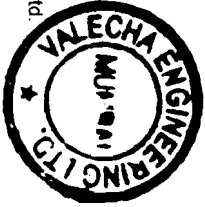
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Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
2.01	BILL NO.2 : EARTH WORKS Roadway and Drainage excavation necessary for construction of roadway complete as per Technical Specification Clause 301 and as per the direction of Engineer.				
	a) All kinds of soil	Cum	94813.00	55.00 Rupees Fifty Five Only	5,214,715.00 Rupees Fifty Two Lakhs Fourteen Thousand Seven Hundred Fifteen Only
	b) Soft Rock (Blasting not required)	Cum	500.00	70.00 Rupees Seventy Only	35,000.00 Rupees Thirty Five Thousand Only
	c) Hard Rock (Blasting required)	Cum	500.00	125.00 Rupees One Hundred Twenty Five Only	62,500.00 Rupees Sixty Two Thousand Five Hundred Only
	d) Hard rock (Blasting not required)	Cum	500.00	200.00 Rupees Two Hundred Only	100,000.00 Rupees One Lakh Only
2.02	Construction of embankment with approved material having CBR value not less than 10% from approved borrow areas with all leads and lifts complete as per Drawing and Technical Specification Clause 305 and as per the direction of the Engineer.	Cum	72409.00	270.00 Rupees Two Hundred Seventy Only	19,550,430.00 Rupees One Crore Ninety Five Lakhs Fifty Thousand Four Hundred Thirty Only
2.03	Construction of embankment with sand from approved borrow areas with all leads and lifts complete as per Drawing and Technical Specification Clause 305 and as per the direction of the Engineer.	Cum	328547.00	286.00 Rupees Two Hundred Eighty Six Only	93,964,442.00 Rupees Nine Crores Thirty Nine Lakhs Sixty Four Thousand Four Hundred Forty Two Only
2.04	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	414491.00	300.00 Rupees Three Hundred Only	124,347,300.00 Rupees Twelve Crores Forty Three Lakhs Forty Seven Thousand Three Hundred Only
2.05	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	27994.00	75.00 Rupees Seventy Five Only	2,099,550.00 Rupees Twenty Lakhs Ninety Nine Thousand Five Hundred Fifty Only

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Sl. No.	Description	Unit	Quantity	Rate In Figure and Words	Amount In Figure and Words
2.06	Loosening and re-compacting the existing sub grade in all kinds of soil up to required depth to meet the requirement of table 300-2 complete as per Technical Specification Clause 305 and as per the direction of the Engineer.	Cum	17880.00	20.00 Rupees Twenty Only	357,600.00 Rupees Three Lakhs Fifty Seven Thousand Six Hundred Only
2.07	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	1350.00	180.00 Rupees One Hundred Eighty Only	243,000.00 Rupees Two Lakhs Forty Three Thousand Only
2.08	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 the Engineer.	Sqm	28938.00	5.00 Rupees Five Only	144,690.00 Rupees One Lakh Forty Four Thousand Six Hundred Ninety Only
2.09	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-301.	Cum	5364.00	110.00 Rupees One Hundred Ten Only	590,040.00 Rupees Five Lakhs Ninety Thousand Forty Only
Total for Bill No. 2 Carried forward to Summary					246,709,267.00
					Rupees Twenty Four Crores Sixty Seven Lakhs Nine Thousand Two Hundred Sixty Seven Only

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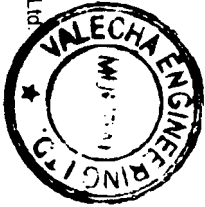


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Sl. No.	Description	Unit	Quantity	Rate In Figure and Words	Amount in Figure and Words
BILL NO.3 : SUB-BASE AND BASE COURSES					
3.01	Construction of Granular Sub-base course using crushed stone aggregate by providing the materials conforming to Gr-I of Table 400-2 complete as per Technical Specification Clause 401 and as per the direction of the Engineer.	Cum	121407.00	1200.00 Rupees One Thousand Two Hundred Only	145,688,400.00 Rupees Fourteen Crores Fifty Six Lakhs Eighty Eight Thousand Four Hundred 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	96032.00	1400.00 Rupees One Thousand Four Hundred Only	134,444,800.00 Rupees Thirteen Crores Forty Four Lakhs Forty Four Thousand Eight Hundred Only
Total for Bill No. 3 Carried forward to Summary					280,133,200.00 Rupees Twenty Eight Crores One Lakh Thirty Three Thousand Two Hundred Only

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SI. No.	Description	Unit	Quantity	Rate In Figure and Words	Amount In Figure and Words
BILL NO.4 : BITUMINOUS COURSES					
4.01	Providing bituminous primer coat over granular surface complete all as per Technical specification clause 502 and as per the direction of Engineer.	Sqm	377494.00	35.00 Rupees Thirty Five Only	13,212,290.00 Rupees One Crore Thirty Two Lakhs Twelve Thousand Two Hundred Ninety 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	377494.00	15.00 Rupees Fifteen Only	5,662,410.00 Rupees Fifty Six Lakhs Sixty Two Thousand Four Hundred Ten Only
	b) Over normal bituminous surface	Sqm	377494.00	12.00 Rupees Twelve Only	4,529,928.00 Rupees Forty Five Lakhs Twenty Nine Thousand Nine Hundred Twenty Eight 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	32925.00	6900.00 Rupees Six Thousand Nine Hundred Only	227,182,500.00 Rupees Twenty Two Crores Seventy One Lakhs Eighty Two Thousand Five Hundred Only
4.04	Providing Bituminous Concrete wearing course with modified bitumen comprising of CRMB-55 complete as per Technical Specification Clause 509 & 521 and as per the direction of Engineer.	Cum	15100.00	7800.00 Rupees Seven Thousand Eight Hundred Only	117,780,000.00 Rupees Eleven Crores Seventy Seven Lakhs Eighty Thousand Only

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Sl. No.	Description	Unit	Quantity	Rate In Figure and Words	Amount In Figure and Words
4.05	Construction of Dry Lean Cement Concrete Sub- base over a prepared sub-grade with coarse and fine aggregate, concrete strength not to be less than 10 Mpa at 7 days, mixed in a batching plant, transported to site, laid with a fixed form paver, compacting with 8-10 tonnes vibratory roller, finishing and curing as per Technical Specification Section 600 and as per the direction of the Engineer.	Cum	21677.00	2400.00 Rupees Two Thousand Four Hundred Only	52,024,800.00 Rupees Five Crores Twenty Lakhs Twenty Four Thousand Eight Hundred Only
4.06	Construction of un-reinforced, dowel jointed plain cement concrete pavement, thickness as per design, over DLC with M 40 grade as per drawing, technical specification and as directed by the Engineer.	Cum	43353.00	4500.00 Rupees Four Thousand Five Hundred Only	195,088,500.00 Rupees Nineteen Crores Fifty Lakhs Eighty Eight Thousand Five Hundred Only
Total for Bill No.4 Carried forward to Summary					615,480,428.00
					Rupees Sixty One Crores Fifty Four Lakhs Eighty Thousand Four Hundred Twenty Eight Only

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SI. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
BILL NO.5 : CULVERTS AND UNDERPASSES					
5.01	Earthwork in excavation of foundation for structures 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	12016.00	110.00 Rupees One Hundred Ten Only	1,321,760.00 Rupees Thirteen Lakhs Twenty One Thousand Seven Hundred Sixty 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	2350.00	45.00 Rupees Forty Five Only	105,750.00 Rupees One Lakh Five Thousand Seven Hundred Fifty 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	1029.00	1100.00 Rupees One Thousand One Hundred Only	1,131,900.00 Rupees Eleven Lakhs Thirty One Thousand Nine Hundred Only
5.04	Providing filter media behind abutment, wing wall and return wall complete as per drawing and Technical Specification clause 2504, 2509, 2510 and as per the direction of Engineer.	Cum	435.00	900.00 Rupees Nine Hundred Only	391,500.00 Rupees Three Lakhs Ninety One Thousand Five Hundred 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	2414.00	4300.00 Rupees Four Thousand Three Hundred Only	10,380,200.00 Rupees One Crore Three Lakhs Eighty Thousand Two Hundred 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	5668.00	4700.00 Rupees Four Thousand Seven Hundred Only	26,639,600.00 Rupees Two Crores Sixty Six Lakhs Thirty Nine Thousand Six Hundred Only
5.07	Reinforced cement concrete of M-20 grade in all types of culverts as per drawing and technical specification Section 1500, 1700 & 2200 and as per the direction of Engineer.	Cum	1413.00	5200.00 Rupees Five Thousand Two Hundred Only	7,347,600.00 Rupees Seventy Three Lakhs Forty Seven Thousand Six Hundred 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	289.00	6000.00 Rupees Six Thousand Only	1,734,000.00 Rupees Seventeen Lakhs Thirty Four Thousand Only
5.09	HYSD (TMT) bar reinforcement complete as per drawing and technical specifications clause 1600 and as per the direction of Engineer.	MT	92.00	65000.00 Rupees Sixty Five Thousand Only	5,980,000.00 Rupees Fifty Nine Lakhs Eighty Thousand Only



SI. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
5.10	Providing laying and joining NP-4(I.S 458) hume pipes with culvert complete as per drawing Tech. Specification section 2900 and IRC special publication no.13 and as per the direction of Engineer.				
	a) 1m dia Hume Pipe in Single Row	Lm	1178.00	6500.00 Rupees Six Thousand Five Hundred Only	7,657,000.00 Rupees Seventy Six Lakhs Fifty Seven Thousand Only
	b) 1.2m dia Hume Pipe in Single Row	Lm	780.00	8500.00 Rupees Eight Thousand Five Hundred Only	6,630,000.00 Rupees Sixty Six Lakhs Thirty Thousand Only
	c) 1m dia Hume Pipe in Double Row	Double Row Lm	450.00	13000.00 Rupees Thirteen Thousand Only	5,850,000.00 Rupees Fifty Eight Lakhs Fifty Thousand Only
	d) 1.2m dia Hume Pipe in Double Row	Double Row Lm	870.00	17000.00 Rupees Seventeen Thousand Only	14,790,000.00 Rupees One Crore Forty Seven Lakhs Ninety Thousand Only
5.11	Providing & laying 0.3m dia NP-4 Hume Pipe with collars on first class bedding for utility duct and reptile pass including cost of all materials, labour, transportation, loading & unloading, taxes, watering, curing, T&P etc. all complete as per Technical Specification Section 2900 & IRC SP-13 and as per the direction of the Engineer.	Lm	1190.00	1100.00 Rupees One Thousand One Hundred Only	1,309,000.00 Rupees Thirteen Lakhs Nine Thousand Only
5.12	Providing & laying 0.6m dia NP-3 Hume Pipe with collars in single row on first class bedding for spur road drain including cost of all materials, labour, transportation, loading & unloading, taxes, watering, curing, T&P etc. all complete as per Technical Specification Section 2900 & IRC SP-13 and as per the direction of the Engineer.	Lm	2240.00	3000.00 Rupees Three Thousand Only	6,720,000.00 Rupees Sixty Seven Lakhs Twenty Thousand Only

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Sl. No.	Description	Unit	Quantity	Rate In Figure and Words	Amount In Figure and Words
5.13	Providing and laying filter material underneath stone pitching in slopes complete as per drawings and technical specification section 2504, 2509, 2510 and as per the direction of Engineer.	Cum	902.00	900.00 Rupees Nine Hundred Only	811,800.00 Rupees Eight Lakhs Eleven Thousand Eight Hundred Only
5.14	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	1810.00	1100.00 Rupees One Thousand One Hundred Only	1,991,000.00 Rupees Nineteen Lakhs Ninety One Thousand Only
5.15	Providing rubble stone flooring in Cement mortar(1 Cement 3 sand) and joints complete as per Drawing and Technical Specification Section 1400, 2505 and as per the direction of Engineer.	Cum	1566.00	1100.00 Rupees One Thousand One Hundred Only	1,722,600.00 Rupees Seventeen Lakhs Twenty Two Thousand Six Hundred Only
5.16	Providing weep holes in box portion, return wall, wing wall etc. all complete as per drawing and technical specification clause . 2706 and as per the direction of Engineer.	No	480.00	135.00 Rupees One Hundred Thirty Five Only	64,800.00 Rupees Sixty Four Thousand Eight Hundred Only
5.17	Supplying, fitting and fixing tar paper bearing in position complete with all accessories as per drawings and technical specification clause 2605 and as per the direction of Engineer.	Sqm	15.00	25.00 Rupees Twenty Five Only	375.00 Rupees Three Hundred Seventy Five Only
5.18	Supplying and fixing Asphaltic Plug expansion joints complete as per Drawing and as per IRC: SP : 69-2005 and as per the direction of Engineer.	Lm	338.00	6000.00 Rupees Six Thousand Only	2,028,000.00 Rupees Twenty Lakhs Twenty Eight Thousand Only
5.19	Cement Concrete M-15 grade for Parapet Wall as per Drawing and Technical Specifications 1500, 1700, 2100 and 2200 and as per the direction of the Engineer.	Cum	281.00	600.00 Rupees Six Hundred Only	168,600.00 Rupees One Lakh Sixty Eight Thousand Six Hundred Only

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SI. No.	Description	Unit	Quantity	Rate In Figure and Words	Amount In Figure and Words
5.20	Bituminous wearing course 56mm thick comprising of 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	1710.00	513.00 Rupees Five Hundred Thirteen Only	877,230.00 Rupees Eight Lakhs Seventy Seven Thousand Two Hundred Thirty Only
5.21	Synthetic enamel painting of culvert no. and span arrangement as per IRC - 7 - 1971 and as per the direction of Engineer.	No.	48.00	250.00 Rupees Two Hundred Fifty Only	12,000.00 Rupees Twelve Thousand Only
5.22	Providing and applying 2 coats of water based cement paint to unplastered concrete surface after cleaning the surface etc. complete as per the direction of Engineer.	Sqm	704.00	70.00 Rupees Seventy Only	49,280.00 Rupees Forty Nine Thousand Two Hundred Eighty Only
Total for Bill No.5 Carried forward to Summary					105,713,995.00
					Rupees Ten Crores Fifty Seven Lakhs Thirteen Thousand Nine Hundred Ninety Five Only



SI. No.	Description	Unit	Quantity	Rate In Figure and Words	Amount In Figure and Words
BILL NO.6 : BRIDGES					
6.01	Earthwork in excavation of foundation for structures complete as per drawing and technical specification clause 304 including all leads & lift and as per the direction of Engineer.	Cum	3752.00	120.00 Rupees One Hundred Twenty Only	450,240.00 Rupees Four Lakhs Fifty Thousand Two Hundred Forty 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	1141.00	250.00 Rupees Two Hundred Fifty Only	285,250.00 Rupees Two Lakhs Eighty Five Thousand Two Hundred Fifty 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	87.00	900.00 Rupees Nine Hundred Only	78,300.00 Rupees Seventy Eight Thousand Three Hundred 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	177.00	4200.00 Rupees Four Thousand Two Hundred Only	743,400.00 Rupees Seven Lakhs Forty Three Thousand Four Hundred Only
6.05	Cement concrete M-15 grade in foundation and substructure etc including centering and shuttering all complete as per drawing and Technical specification Section 1500, 1700, 2100, 2200 and as per the direction of Engineer.	Cum	360.00	4700.00 Rupees Four Thousand Seven Hundred Only	1,692,000.00 Rupees Sixteen Lakhs Ninety Two Thousand Only
6.06	Reinforced cement concrete M-20 grade in foundation complete as per drawing & Technical specification sections 1500, 1700, 2100, 2200 and as per the direction of Engineer.	Cum	322.00	5200.00 Rupees Five Thousand Two Hundred Only	1,674,400.00 Rupees Sixteen Lakhs Seventy Four Thousand Four Hundred Only

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Sl. No.	Description	Unit	Quantity	Rate In Figure and Words	Amount in Figure and Words
6.07	Reinforced cement concrete of following grades in substructure complete as per drawing & Technical specification sections 1500, 1700, 2200 and as per the direction of Engineer.				
	a) M-20 grade	Cum	480.00	6000.00 Rupees Six Thousand Only	2,880,000.00 Rupees Twenty Eight Lakhs Eighty Thousand Only
	b) M-35 grade	Cum	196.00	6000.00 Rupees Six Thousand Only	1,176,000.00 Rupees Eleven Lakhs Seventy Six Thousand 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-25 grade	Cum	33.00	6500.00 Rupees Six Thousand Five Hundred Only	214,500.00 Rupees Two Lakhs Fourteen Thousand Five Hundred Only
	b) M-30 grade	Cum	282.00	7000.00 Rupees Seven Thousand Only	1,974,000.00 Rupees Nineteen Lakhs Seventy Four Thousand Only
6.09	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	26.00	65000.00 Rupees Sixty Five Thousand Only	1,690,000.00 Rupees Sixteen Lakhs Ninety Thousand Only
	b) in Substructure	MT	58.00	65000.00 Rupees Sixty Five Thousand Only	3,770,000.00 Rupees Thirty Seven Lakhs Seventy Thousand Only
	c) in Superstructure	MT	36.00	65000.00 Rupees Sixty Five Thousand Only	2,340,000.00 Rupees Twenty Three Lakhs Forty Thousand Only



Sl. No.	Description	Unit	Quantity	Rate In Figure and Words	Amount In Figure and Words
6.10	Providing and fixing Tar Paper Bearing complete as per Drawing and Technical Specification 2000 and as per the direction of the Engineer.	Sqm	54.00	200.00 Rupees Two Hundred Only	10,800.00 Rupees Ten Thousand Eight Hundred Only
6.11	Providing 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	96.00	6000.00 Rupees Six Thousand Only	576,000.00 Rupees Five Lakhs Seventy Six Thousand Only
6.12	Providing Bituminous wearing course 56mm thick comprising 50mm thick asphaltic Concrete with modified bitumen comprising 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	1046.00	369.00 Rupees Three Hundred Sixty Nine Only	385,974.00 Rupees Three Lakhs Eighty Five Thousand Nine Hundred Seventy Four Only
6.13	Providing and fixing Drainage Spouts Complete as per drawing and Technical Specification Clause 2705 and as per the direction of Engineer.	No	20.00	400.00 Rupees Four Hundred Only	8,000.00 Rupees Eight Thousand Only
6.14	Providing and laying Stone pitching in slopes complete as per drawing and Technical Specification Section 2504 and as per the direction of Engineer.	Cum	29.00	1100.00 Rupees One Thousand One Hundred Only	31,900.00 Rupees Thirty One Thousand Nine Hundred Only
6.15	Providing and 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	121.00	900.00 Rupees Nine Hundred Only	108,900.00 Rupees One Lakh Eight Thousand Nine Hundred Only
6.16	Providing weep holes in abutments, wing walls and return walls etc. as per drawing and Technical Specification clause 2706 and as per the direction of Engineer.	No	332.00	135.00 Rupees One Hundred Thirty Five Only	44,820.00 Rupees Forty Four Thousand Eight Hundred Twenty Only
6.17	Providing rubble Stone flooring in Cement mortar (1Cement:3 sand) and joints Complete as per drawing and Technical Specification Section 1400 and 2505 and as per the direction of Engineer.	Cum	194.00	1200.00 Rupees One Thousand Two Hundred Only	232,800.00 Rupees Two Lakhs Thirty Two Thousand Eight Hundred Only



Sl. No.	Description	Unit	Quantity	Rate In Figure and Words	Amount in Figure and Words
6.18	Supplying and fixing of Asphaltic plug expansion joint complete as per drawing specifications and as per the direction of Engineer.	Lm	144.00	2000.00 Rupees Two Thousand Only	288,000.00 Rupees Two Lakhs Eighty Eight Thousand Only
6.19	Synthetic enamel painting of Bridge No. and span arrangement as per IRC - 7 - 1971 and as per the direction of Engineer.	No.	16.00	500.00 Rupees Five Hundred Only	8,000.00 Rupees Eight Thousand Only
6.20	Carrying and Confirmatory bores up to required depth at locations of bridges 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.				
	a) In all types of soil (except hard rock)				
	(i) Depth from 0m to 10m	Lm	100.00	1000.00 Rupees One Thousand Only	100,000.00 Rupees One Lakh Only
	(ii) Depth from 10m to 20m	Lm	15.00	1800.00 Rupees One Thousand Eight Hundred Only	27,000.00 Rupees Twenty Seven Thousand Only
	(iii) Depth from 20m to 30m	Lm	10.00	2500.00 Rupees Two Thousand Five Hundred Only	25,000.00 Rupees Twenty Five Thousand Only
	b) In Hard Rock				
	(i) Depth from 0m to 5m	Lm	10.00	3500.00 Rupees Three Thousand Five Hundred Only	35,000.00 Rupees Thirty Five Thousand Only
	(ii) Depth from 5m to 10m	Lm	7.00	4500.00 Rupees Four Thousand Five Hundred Only	31,500.00 Rupees Thirty One Thousand Five Hundred Only
6.21	Providing and painting of flood gauge on substructure in full height and 500mm width and as per the direction of Engineer.	Lm	45.00	45.00 Rupees Forty Five Only	2,025.00 Rupees Two Thousand Twenty Five Only



Sl. No.	Description	Unit	Quantity	Rate In Figure and Words	Amount In Figure and Words
6.22	Providing and laying 150mm dia. HDPE Service pipe as per drawing and as per the direction of Engineer.	Lm	354.00	550.00 Rupees Five Hundred Fifty Only	194,700.00 Rupees One Lakh Ninety Four Thousand Seven Hundred Only
6.23	Providing Gravel fill below pitching in quadrant portion with approved material complete as per Drawing and Technical Specification Clause 305 with all leads and lifts and as per the direction of the Engineer.	Cum	516.00	2000.00 Rupees Two Thousand Only	1,032,000.00 Rupees Ten Lakhs Thirty Two Thousand Only
6.24	Providing Sand Filling in Foundation Trenches as per Drawing & Technical Specification Clause 304, 305 and as per the direction of the Engineer.	Cum	116.00	300.00 Rupees Three Hundred Only	34,800.00 Rupees Thirty Four Thousand Eight Hundred Only
6.25	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	280.00	4200.00 Rupees Four Thousand Two Hundred Only	1,176,000.00 Rupees Eleven Lakhs Seventy Six Thousand Only
	b) M-20 Grade	Cum	93.00	4800.00 Rupees Four Thousand Eight Hundred Only	446,400.00 Rupees Four Lakhs Forty Six Thousand Four Hundred Only
6.26	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	177.00	4500.00 Rupees Four Thousand Five Hundred Only	796,500.00 Rupees Seven Lakhs Ninety Six Thousand Five Hundred Only
Total for Bill No.6 Carried forward to Summary					24,564,209.00
					Rupees Two Crores Forty Five Lakhs Sixty Four Thousand Two Hundred Nine Only



Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
BILL NO.7 : RETAINING WALL, DRAINAGE AND PROTECTIVE WORKS					
7.01	Retaining Wall				
(a)	Earthwork in excavation for foundation complete as per drawing and Technical Specification Clause 304 in Retaining wall for high embankment stretches as per the direction of Engineer.	Cum	17298.00	120.00 Rupees One Hundred Twenty Only	2,075,760.00 Rupees Twenty Lakhs Seventy Five Thousand Seven Hundred Sixty Only
(b)	Providing 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	1390.00	4700.00 Rupees Four Thousand Seven Hundred Only	6,533,000.00 Rupees Sixty Five Lakhs Thirty Three Thousand Only
(c)	Cement concrete M-20 for reinforced concrete in foundation and substructure including centering and shuttering all complete as per drawing and Technical Clauses 1500,1700,2100, 2200 and as per the direction of Engineer.	Cum	5548.00	5200.00 Rupees Five Thousand Two Hundred Only	28,849,600.00 Rupees Two Crores Eighty Eight Lakhs Forty Nine Thousand Six Hundred Only
(d)	Providing steel reinforcement HYSD (TMT) for retaining wall complete as per Drawing and Technical Specification Clause 1600 and as per the direction of the Engineer.	MT	444.00	65000.00 Rupees Sixty Five Thousand Only	28,860,000.00 Rupees Two Crores Eighty Eight Lakhs Sixty Thousand Only
(e)	Providing weep holes in retaining wall complete as per drawing and Technical Specification Clause 2706 and as per the direction of Engineer.	No.	6775.00	400.00 Rupees Four Hundred Only	2,710,000.00 Rupees Twenty Seven Lakhs Ten Thousand Only



SI. 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	383.00	1100.00 Rupees One Thousand One Hundred Only	421,300.00 Rupees Four Lakhs Twenty One Thousand Three Hundred Only
7.03	Providing and laying filter material underneath stone pitching on embankment slopes as per drawing and Technical Specification Clause 2504 and as per the direction of Engineer.	Cum	108.00	900.00 Rupees Nine Hundred Only	97,200.00 Rupees Ninety Seven Thousand Two Hundred Only
7.04	Turfing side slopes of main road and service road with grass sods complete as per Technical Specification Clause 307 and as per the direction of Engineer.	Sqm	110474.00	20.00 Rupees Twenty Only	2,209,480.00 Rupees Twenty Two Lakhs Nine Thousand Four Hundred Eighty 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	31720.00	600.00 Rupees Six Hundred Only	19,032,000.00 Rupees One Crore Ninety Lakhs Thirty Two Thousand Only
Total for Bill No.7 Carried forward to Summary					90,788,340.00
					Rupees Nine Crores Seven Lakhs Eighty Eight Thousand Three Hundred Forty Only



Sl. No.	Description	Unit	Quantity	Rate In Figure and Words	Amount In Figure and Words
BILL NO-8 : ROAD SAFETY AND AMENITIES					
8.01	Providing and laying plain cement concrete kerb as per drawing and Technical Specifications Clauses 408, section 1500 and as per the direction of Engineer.	Lm	2840.00	450.00 Rupees Four Hundred Fifty Only	1,278,000.00 Rupees Twelve Lakhs Seventy Eight Thousand Only
8.02	Providing and laying service ducts with 160/130mm dia HDPE Double Walled Corrugated Pipes confirming to IS: 14930 (Part-II) including cutting of trenches and filling thereof as per the direction of Engineer.	Lm	7100.00	1100.00 Rupees One Thousand One Hundred Only	7,810,000.00 Rupees Seventy Eight Lakhs Ten Thousand 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	537.00	600.00 Rupees Six Hundred Only	322,200.00 Rupees Three Lakhs Twenty Two Thousand Two 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	196.00	600.00 Rupees Six Hundred Only	117,600.00 Rupees One Lakh Seventeen Thousand Six Hundred Only
	b) No of Kilometer stone	No	39.00	1594.00 Rupees One Thousand Five Hundred Ninety Four Only	62,166.00 Rupees Sixty Two Thousand One Hundred Sixty Six Only
	c) No. of 5th Kilometer Stone	No	10.00	2600.00 Rupees Two Thousand Six Hundred Only	26,000.00 Rupees Twenty Six Thousand 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	2330.00	1000.00 Rupees One Thousand Only	2,330,000.00 Rupees Twenty Three Lakhs Thirty Thousand 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 1300, 1500, 1600, 1700, 2100, 2200, 2300 and as per the direction of Engineer.	No	56.00	85000.00 Rupees Eighty Five Thousand Only	4,760,000.00 Rupees Forty Seven Lakhs Sixty Thousand Only
8.07	Construction of temporary diversion including temporary cross drainage works for plying of traffic in both directions wherever necessary and maintenance thereof including traffic control and safety complete till the operation of the original road/ structure as per Technical Specification Clause 112.3 and as per the direction of Engineer.	Lm	2550.00	8400.00 Rupees Eight Thousand Four Hundred Only	21,420,000.00 Rupees Two Crores Fourteen Lakhs Twenty Thousand Only
8.08(a)	Providing and laying of hot applied thermoplastic compound 2.5 mm thick including reflectorising glass beads @ 250 gms per sqm area, thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC:35. The finished surface to be level, uniform and free from streaks and holes, as per Technical Specification section 800 and as per direction of Engineer.				
	Lane line / Edge marking and other markings along the strips	Sqm	20262.00	487.50 Rupees Four Hundred Eighty Seven And Fifty Paise Only	9,877,725.00 Rupees Ninety Eight Lakhs Seventy Seven Thousand Seven Hundred Twenty Five Only
8.08(b)	Painting lines, dashes, arrows etc on roads in two coats on new work with ready mixed road marking paint conforming to IS:164 on bituminous surface, including cleaning the surface of all dirt, dust and other foreign matter, demarcation at site and traffic control etc. complete as per the direction of Engineer.				
	Directional arrows and lettering etc. as per drawing and specifications.	Sqm	450.00	450.00 Rupees Four Hundred Fifty Only	202,500.00 Rupees Two Lakhs Two Thousand Five Hundred Only
8.09	Supplying and fixing sign boards complete as per Technical Specifications Clause 801. Including the cost of Posts, Fitting & fixing. Sheeting will be retro reflective type of high intensively grade and messages / boards and as per the direction of Engineer.				
(a)	Informatory Signs				
	(i) Facility Information (800 x 600)mm	No	32.00	5000.00 Rupees Five Thousand Only	160,000.00 Rupees One Lakh Sixty Thousand Only



SI. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
	(ii) Direction Signs (1200 x 700 mm)	No	4.00	8000.00 Rupees Eight Thousand Only	32,000.00 Rupees Thirty Two Thousand Only
	(iii) Advance Direction (size 1800 x 1200mm) ,	No	4.00	8000.00 Rupees Eight Thousand Only	32,000.00 Rupees Thirty Two Thousand Only
	(iv) Re-Assurance Sign (1800 X 1200 mm) ,	No	4.00	8000.00 Rupees Eight Thousand Only	32,000.00 Rupees Thirty Two Thousand Only
	(v) Destination Sign (1500 X 900 mm) ,	No	4.00	8000.00 Rupees Eight Thousand Only	32,000.00 Rupees Thirty Two Thousand Only
	(vi) Place Identification (1500 X 900 mm) ,	No	56.00	7000.00 Rupees Seven Thousand Only	392,000.00 Rupees Three Lakhs Ninety Two Thousand Only
	(vii) Toll Booth (1500 X 900 mm)	No	4.00	8000.00 Rupees Eight Thousand Only	32,000.00 Rupees Thirty Two Thousand Only
	(viii) Bus Lane Sign (450mm x 600mm)	No	56.00	7000.00 Rupees Seven Thousand Only	392,000.00 Rupees Three Lakhs Ninety Two Thousand Only
	(ix) Other Informatory Signs (2100 x 1500mm)	No	4.00	8000.00 Rupees Eight Thousand Only	32,000.00 Rupees Thirty Two Thousand Only
(b)	Cautionary Signs triangular 900mm side	No	20.00	4800.00 Rupees Four Thousand Eight Hundred Only	96,000.00 Rupees Ninety Six Thousand Only

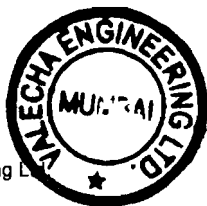


SI. No.	Description	Unit	Quantity	Rate In Figure and Words	Amount In Figure and Words
(c)	Mandatory Signs				
	(i) Circular 600mm dia	No	198.00	4800.00 Rupees Four Thousand Eight Hundred Only	950,400.00 Rupees Nine Lakhs Fifty Thousand Four Hundred Only
	(ii) Octagon 900 mm height	No	130.00	4000.00 Rupees Four Thousand Only	520,000.00 Rupees Five Lakhs Twenty Thousand Only
	(iii) Triangular 900 mm side	No	517.00	4800.00 Rupees Four Thousand Eight Hundred Only	2,481,600.00 Rupees Twenty Four Lakhs Eighty One Thousand Six Hundred Only
8.10	Providing & fixing the following retro - reflectorised items complete as per drawing , Technical specifications clause 805 and as per the direction of Engineer.				
	(i) Roadway delineator	No	1043.00	200.00 Rupees Two Hundred Only	208,600.00 Rupees Two Lakhs Eight Thousand Six Hundred Only
	(ii) Hazard Marker	No	96.00	600.00 Rupees Six Hundred Only	57,600.00 Rupees Fifty Seven Thousand Six Hundred Only
	(iii) Object Marker	No	60.00	600.00 Rupees Six Hundred Only	36,000.00 Rupees Thirty Six Thousand 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.	4589.00	475.00 Rupees Four Hundred Seventy Five Only	2,179,775.00 Rupees Twenty One Lakhs Seventy Nine Thousand Seven Hundred Seventy Five Only



SI. 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.	Lm	1200.00	2880.00 Rupees Two Thousand Eight Hundred Eighty Only	3,456,000.00 Rupees Thirty Four Lakhs Fifty Six Thousand Only
8.13	Providing and fixing Pedestrian guard rails in modules including painting with approved paint complete as per drawing and Technical Specification Clause 803,1008,1300 & 1700 direction of the Engineer.	Lm	12688.00	3000.00 Rupees Three Thousand Only	38,064,000.00 Rupees Three Crores Eighty Lakhs Sixty Four Thousand 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	30.00	3000.00 Rupees Three Thousand Only	90,000.00 Rupees Ninety Thousand 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.	Lm	559.00	850.00 Rupees Eight Hundred Fifty Only	475,150.00 Rupees Four Lakhs Seventy Five Thousand One Hundred Fifty Only
8.16	Providing road hump complete at required places as per drawing and as per the direction of Engineer.	Lm	310.00	2175.00 Rupees Two Thousand One Hundred Seventy Five Only	674,250.00 Rupees Six Lakhs Seventy Four Thousand Two Hundred Fifty Only

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Chief Engineer
World Bank Projects, Odisha
Employer

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

SI. 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.	1.00	1370000.00 Rupees Thirteen Lakhs Seventy Thousand Only	1,370,000.00 Rupees Thirteen Lakhs Seventy Thousand Only
8.18	Providing and fixing of bi-directional retro reflective raised pavement markers of approved colour, Quality & make conforming to ASTM-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	12738.00	200.00 Rupees Two Hundred Only	2,547,600.00 Rupees Twenty Five Lakhs Forty Seven Thousand Six Hundred Only
8.19	Supplying, erecting and commissioning 100KVA diesel powered generator of approved make for Toll Plaza at required place as per the direction & approval of Engineer including cost of all labour, transportation, taxes, duties etc. complete.	No	1.00	1000000.00 Rupees Ten Lakhs Only	1,000,000.00 Rupees Ten Lakhs Only
	Total for Bill No.8 Carried forward to Summary				103,549,166.00 Rupees Ten Crores Thirty Five Lakhs Forty Nine Thousand One Hundred Sixty Six Only



Sl. No.	Description	Unit	Quantity	Rate In Figure and Words	Amount In Figure and Words
BILL NO.9 MAINTENANCE, REPAIR AND REHABILITATION					
9.01	Restoration of Rain Cuts (Restoration of rain cuts with soil, moorum, gravel or a mixture of these, clearing the loose soil, benching for 300 mm width, laying fresh material in layers not exceeding 250 mm and compacting with plate compactor or power rammers to restore the original alignment, levels and slopes) as per direction of the Engineer.	Cum	662.00	120.00 Rupees One Hundred Twenty Only	79,440.00 Rupees Seventy Nine Thousand Four Hundred Forty 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 direction of the Engineer.	Sqm	52920.00	24.00 Rupees Twenty Four Only	1,270,080.00 Rupees Twelve Lakhs Seventy Thousand Eighty Only
9.03	Maintenance of Earth Shoulder by stripping excess soil from the shoulder surface to achieve the approved level and compacting with plate compactor etc. complete as per direction of the Engineer.	Sqm	132300.00	24.00 Rupees Twenty Four Only	3,175,200.00 Rupees Thirty One Lakhs Seventy Five Thousand Two Hundred 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 directed by the Engineer.	Sqm	54574.00	200.00 Rupees Two Hundred Only	10,914,800.00 Rupees One Crore Nine Lakhs Fourteen Thousand Eight Hundred Only
9.05	Epoxy bonding of new concrete to old concrete for jacketing as Technical Specification clause 2805 and as per the direction of Engineer.	Sqm	971.00	200.00 Rupees Two Hundred Only	194,200.00 Rupees One Lakh Ninety Four Thousand Two Hundred Only
Total for Bill No.9 Carried forward to Summary					15,633,720.00
					Rupees One Crore Fifty Six Lakhs Thirty Three Thousand Seven Hundred Twenty Only



Sl. No.	Description	Unit	Quantity	Rate In Figure and Words	Amount in Figure and Words
BILL NO.10 ENVIRONMENTAL MITIGATION MEASURES					
10.01	Earthwork in excavation of foundation for structures complete as per drawing no. OSRP/CEG/SH/ENV/1-A,B,C,03,04-A,B,05-A, 07, 09,10, 12 and technical specifications clause 304 including all leads and lifts and as per the direction of the Engineer.	Cum	430.00	110.00 Rupees One Hundred Ten Only	47,300.00 Rupees Forty Seven Thousand Three Hundred 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 complete as per Drawing No-OSRP/CEG/SH/ENV/1-A, B, C, D, 03, 04, A, B, 05, 05-A, 07, 09, 10, 12 as per technical specifications and direction of the Engineer.	Cum	80.00	450.00 Rupees Four Hundred Fifty Only	36,000.00 Rupees Thirty Six Thousand Only
10.03	Providing & laying in position Cement Concrete M-15 grade in foundation, levelling course etc. including centering and shuttering all complete as per drawing no. OSRP/CEG/SH/ENV/1A,B,C,D,03,04-A,B,05,05-A,07,09,10, 12 and Technical Specification Sections 1500 and 1700 and as per the direction of Engineer.	Cum	282.00	4700.00 Rupees Four Thousand Seven Hundred Only	1,325,400.00 Rupees Thirteen Lakhs Twenty Five Thousand Four Hundred Only
10.04	Providing & laying in position Cement Concrete M-20 grade in foundation, levelling course etc. including centering and shuttering all complete as per drawing no. OSRP/CEG/SH/ENV/1A,B,C,09, Major Jns and Technical Specification Sections 1500 and 1700.and as per the direction of the Engineer.	Cum	43.00	5200.00 Rupees Five Thousand Two Hundred Only	223,600.00 Rupees Two Lakhs Twenty Three Thousand Six Hundred Only
10.05	Providing weep holes in PCC toe wall with 100mm dia AC pipe at 1mtrs horizontal interval all complete as per Drawing no. OSRP/CEG/SH/ENV/03 and Technical Specifications cl no. 2706 & 2200 and as per the direction of the Engineer.	No	263.00	135.00 Rupees One Hundred Thirty Five Only	35,505.00 Rupees Thirty Five Thousand Five Hundred Five Only
10.06	Providing & laying in position Reinforced cement concrete of M-20 Grade in foundation complete as per Drawing No. OSRP/CEG/SH/ENV/04 - A, B, C, 05, 05 -A, 06, 07, 10 & Technical Specification sections 1700, 2100 & 2200 and as per the direction of the Engineer.	Cum	83.00	5200.00 Rupees Five Thousand Two Hundred Only	431,600.00 Rupees Four Lakhs Thirty One Thousand Six Hundred Only



Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
10.07	Providing HYSD (TMT) bar reinforcement with anti-corrosive treatment coating including cutting, bending, binding and placing the bars in position including cost of binding wire etc. complete as per Drawing No. OSRP/CEG/SH/ENV/04 - A, B, C, D, 05, 06, 07, 10 and Technical Specifications Clause 1600 and as per the direction of the Engineer.	MT	4.00	65000.00 Rupees Sixty Five Thousand Only	260,000.00 Rupees Two Lakhs Sixty Thousand Only
10.08	Providing and laying filter material underneath the pitching in slopes at water bodies and ponds as per technical specification clause 2500, drawing no.OSRP/CEG/SH/ENV/3 and as per the direction of the Engineer.	Cum	158.00	400.00 Rupees Four Hundred Only	63,200.00 Rupees Sixty Three Thousand Two Hundred Only
10.09	Providing and laying stone pitching on slopes over filter material at water bodies and ponds as per technical specification clause 2500 drawing no.OSRP/CEG/SH/ENV/3 and as per the direction of the Engineer.	Cum	210.00	1800.00 Rupees One Thousand Eight Hundred Only	378,000.00 Rupees Three Lakhs Seventy Eight Thousand Only
10.10	Providing cement paint two coats to the walls as per drawing no. OSRP/CEG/SH/ENV/03, 04-A, B, 05, 05A, 10 and as per the direction of the Engineer.	Sqm	623.00	70.00 Rupees Seventy Only	43,610.00 Rupees Forty Three Thousand Six Hundred Ten Only
10.11	Providing and fixing fixed flower vase of bottom(150x150), top (400x400) of depth 300mm and 40mm thick CC M-20 grade as per drawing no OSRP/CEG/SH/ENV/4A and as per direction of Engineer.	No	84.00	500.00 Rupees Five Hundred Only	42,000.00 Rupees Forty Two Thousand Only
10.12	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	900.00	1100.00 Rupees One Thousand One Hundred Only	990,000.00 Rupees Nine Lakhs Ninety Thousand Only
10.13	Maintenance of haulage road for 4 occurrences through out the construction period as per technical specification cl.no.3002 and as per the direction of Engineer.	Cum	22500.00	1400.00 Rupees One Thousand Four Hundred Only	31,500,000.00 Rupees Three Crores Fifteen Lakhs Only
10.14	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	30000.00	250.00 Rupees Two Hundred Fifty Only	7,500,000.00 Rupees Seventy Five Lakhs Only

(Signature)

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

Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
10.15	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	1.00	800000.00 Rupees Eight Lakhs Only	800,000.00 Rupees Eight Lakhs Only
10.16	Providing silt fence and sediment arrestor 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/PW, technical specifications including cost of all materials, labour, transportation, taxes, sundries, curing, T&P etc. and as per the direction of the Engineer.	Lm	3500.00	196.00 Rupees One Hundred Ninety Six Only	686,000.00 Rupees Six Lakhs Eighty Six Thousand Only
10.17	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/CEG/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	288.00	193.00 Rupees One Hundred Ninety Three Only	55,584.00 Rupees Fifty Five Thousand Five Hundred Eighty Four Only
Sub-Total Bill No. 10					44,417,799.00
					Rupees Four Crores Forty Four Lakhs Seventeen Thousand Seven Hundred Ninety Nine Only



SI. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
Schedule of Daywork Rates: 1. Labour					
D101	Labour (Un-skilled)	Day	200.00	150.00 Rupees One Hundred Fifty Only	30,000.00 Rupees Thirty Thousand Only
D102	Mason (Special)	Day	25.00	205.00 Rupees Two Hundred Five Only	5,125.00 Rupees Five Thousand One Hundred Twenty Five Only
D103	Carpenter (Special)	Day	10.00	205.00 Rupees Two Hundred Five Only	2,050.00 Rupees Two Thousand Fifty Only
D104	Mason (Second Class)	Day	25.00	190.00 Rupees One Hundred Ninety Only	4,750.00 Rupees Four Thousand Seven Hundred Fifty Only
D105	Carpenter (Second Class)	Day	10.00	190.00 Rupees One Hundred Ninety Only	1,900.00 Rupees One Thousand Nine Hundred Only
D106	Steelworker Erector	Day	35.00	205.00 Rupees Two Hundred Five Only	7,175.00 Rupees Seven Thousand One Hundred Seventy Five Only
D107	Driver for vehicle up to 10 tons	Day	25.00	205.00 Rupees Two Hundred Five Only	5,125.00 Rupees Five Thousand One Hundred Twenty Five Only
D108	Operator for excavator, dragline, shovel or crane	Day	25.00	205.00 Rupees Two Hundred Five Only	5,125.00 Rupees Five Thousand One Hundred Twenty Five Only
D109	Operator for tractor with dozer blade or ripper	Day	25.00	205.00 Rupees Two Hundred Five Only	5,125.00 Rupees Five Thousand One Hundred Twenty Five Only
D110	Operator grader	Day	25.00	205.00 Rupees Two Hundred Five Only	5,125.00 Rupees Five Thousand One Hundred Twenty Five Only
D111	Operator in other construction equipment	Day	25.00	205.00 Rupees Two Hundred Five Only	5,125.00 Rupees Five Thousand One Hundred Twenty Five Only

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Contractor



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SI. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
D112	Chowkidars for watch & ward	Day	250.00	150.00 Rupees One Hundred Fifty Only	37,500.00 Rupees Thirty Seven Thousand Five Hundred Only
Total					114,125.00 Rupees One Lakh Fourteen Thousand One Hundred Twenty Five Only
D113	Allow 0% (Zero Percent) of Subtotal for Contractor's overhead, profit, etc., in accordance with paragraph 3 (b) above			0.00%	-
					114,125.00 Rupees One Lakh Fourteen Thousand One Hundred Twenty Five Only

Chief Engineer
World Bank Projects, Odisha
Employer

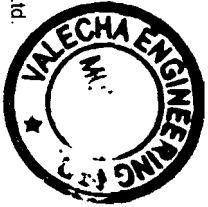
Chief Engineer
World Bank Project
C/o The E.I.C. (Civil), Odisha
Bhubaneswar.



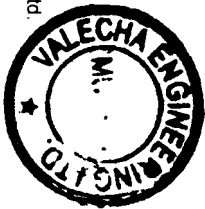
Sl. No.	Description	Unit	Quantity	Rate In Figure and Words	Amount In Figure and Words
Schedule of Daywork Rates: 2. Materials					
D201	Cement, ordinary Portland or equivalent in bags conforming to IS:269:1989 and IS 455:1989	Per Mt	10.00	6295.55 Rupees Six Thousand Two Hundred Ninety Five And Fifty Five Paise Only	62,955.50 Rupees Sixty Two Thousand Nine Hundred Fifty Five And Fifty Paise Only
D202	HYSD reinforcing bars upto 25 mm dia conforming to IS:1786:1989	Per Mt	2.00	44631.00 Rupees Forty Four Thousand Six Hundred Thirty One Only	89,262.00 Rupees Eighty Nine Thousand Two Hundred Sixty Two Only
D203	Bricks of class designation 75 as per IS:1077:1992	Per 1000 Nos	10000.00	5221.25 Rupees Five Thousand Two Hundred Twenty One And Twenty Five Paise Only	52,212.50 Rupees Fifty Two Thousand Two Hundred Twelve And Fifty Paise Only
D204	Anti Corrosive Bituminous paint	Per Lit	5.00	160.27 Rupees One Hundred Sixty And Twenty Seven Paise Only	801.35 Rupees Eight Hundred One And Thirty Five Paise Only
D205	Enamel Paint of any shade & colour (IS:2932-1964 & IS 137-1975)	Per Lit	5.00	160.27 Rupees One Hundred Sixty And Twenty Seven Paise Only	801.35 Rupees Eight Hundred One And Thirty Five Paise Only
D206	Coarse Sand as per IS 1542	Per Cum	25.00	216.50 Rupees Two Hundred Sixteen And Fifty Paise Only	5,412.50 Rupees Five Thousand Four Hundred Twelve And Fifty Paise Only
D207	R.R. Stone for masonry	Per Cum	25.00	782.10 Rupees Seven Hundred Eighty Two And Ten Paise Only	19,552.50 Rupees Nineteen Thousand Five Hundred Fifty Two And Fifty Paise Only



Sl. No.	Description	Unit	Quantity	Rate In Figure and Words	Amount In Figure and Words
D208	Crusher broken stone aggregates up to 25 mm nominal size	Per Cum	25.00	610.00 Rupees Six Hundred Ten Only	15,250.00 Rupees Fifteen Thousand Two Hundred Fifty Only
D209	Crusher broken stone aggregates Above 25 mm nominal size	Per Cum	25.00	610.00 Rupees Six Hundred Ten Only	15,250.00 Rupees Fifteen Thousand Two Hundred Fifty Only
D210	Portable water at site	KL	2500.00	10.00 Rupees Ten Only	25,000.00 Rupees Twenty Five Thousand Only
D211	Gravel/ Moorum for Road Work	Per Cum	25.00	578.00 Rupees Five Hundred Seventy Eight Only	14,450.00 Rupees Fourteen Thousand Four Hundred Fifty Only
D212	Bitumen-VG-30	Per Mt	2.00	38935.00 Rupees Thirty Eight Thousand Nine Hundred Thirty Five Only	77,870.00 Rupees Seventy Seven Thousand Eight Hundred Seventy Only
					378,817.70
					Rupees Three Lakhs Seventy Eight Thousand Eight Hundred Seventeen And Seventy Paise Only
D213	Allow 0% (Zero Percent) of Subtotal for Contractor's overhead, profit, etc.. in accordance with paragraph 3 (b) above			0.00%	-
					378,817.70
					Rupees Three Lakhs Seventy Eight Thousand Eight Hundred Seventeen And Seventy Paise Only



Sl. No.	Description	Unit	Quantity	Rate in Figure and Words	Amount in Figure and Words
Schedule of Daywork Rates: 3. Contractor's Equipment					
D301 Excavator, face shovel, or dragging including the cost of operator:					
D301.1	Up to and including 1 m3	Hour	25.00	840.00 Rupees Eight Hundred Forty Only	21,000.00 Rupees Twenty One Thousand Only
D301.2	Over 1 m 3 to 2 m 3	Hour	15.00	840.00 Rupees Eight Hundred Forty Only	12,600.00 Rupees Twelve Thousand Six Hundred Only
D301.3	Over 2 m 3	Hour	5.00	840.00 Rupees Eight Hundred Forty Only	4,200.00 Rupees Four Thousand Two Hundred Only
D302 Tractor, including bull or angle dozer including the cost of operator:					
D302.1	Up to and including 150 kW	Hour	25.00	250.00 Rupees Two Hundred Fifty Only	6,250.00 Rupees Six Thousand Two Hundred Fifty Only
D302.2	Over 150 kW to 200 kW	Hour	15.00	231.00 Rupees Two Hundred Thirty One Only	3,465.00 Rupees Three Thousand Four Hundred Sixty Five Only
D302.3	Over 200 kW to 250 kW	Hour	5.00	231.00 Rupees Two Hundred Thirty One Only	1,155.00 Rupees One Thousand One Hundred Fifty Five Only
D303 Tractor with ripper including the cost of operator:					
D303.1	Up to and including 200 kW	Hour	15.00	249.00 Rupees Two Hundred Forty Nine Only	3,735.00 Rupees Three Thousand Seven Hundred Thirty Five Only
D303.2	Over 200 kW to 250 kW	Hour	5.00	249.00 Rupees Two Hundred Forty Nine Only	1,245.00 Rupees One Thousand Two Hundred Forty Five Only
D304	Motor grader including the cost of operator	Hour	20.00	1545.00 Rupees One Thousand Five Hundred Forty Five Only	30,900.00 Rupees Thirty Thousand Nine Hundred Only
D305	Crane- 5 tonne including the cost of operator	Hour	20.00	230.00 Rupees Two Hundred Thirty Only	4,600.00 Rupees Four Thousand Six Hundred Only



Sl. No.	Description	Unit	Quantity	Rate In Figure and Words	Amount In Figure and Words
D306	Diesel Road Roller, or Vibratory Compactor upto 10 t including the cost of operator	Hour	20.00	995.00 Rupees Nine Hundred Ninety Five Only	19,900.00 Rupees Nineteen Thousand Nine Hundred Only
D307	Trucks, or Truck tipper, or Truck with mounted water tank or truck with crane for removal of accidental vehicles including the cost of operator.	Hour	50.00	582.00 Rupees Five Hundred Eighty Two Only	29,100.00 Rupees Twenty Nine Thousand One Hundred Only
D308 Tractor with trolley, or tractor with water tanker trailer, tractor with ripper Tractor with hydraulic scraper including the cost of operator					
	(a) upto 25 HP	Hour	20.00	249.00 Rupees Two Hundred Forty Nine Only	4,980.00 Rupees Four Thousand Nine Hundred Eighty Only
	(b) For 25-40 HP	Hour	15.00	249.00 Rupees Two Hundred Forty Nine Only	3,735.00 Rupees Three Thousand Seven Hundred Thirty Five Only
D309	Bitumen mixture (10-14 Cft.) C.C including the cost of operator	Hour	10.00	128.00 Rupees One Hundred Twenty Eight Only	1,280.00 Rupees One Thousand Two Hundred Eighty Only
D310 Water pumping sets mounted on trolley (diesel driven)with inlet & outlet pipes including the cost of operator.					
	a) Sets up to 10 HP	Hour	5.00	100.00 Rupees One Hundred Only	500.00 Rupees Five Hundred Only
	b) Sets 11 to 20 HP	Hour	5.00	100.00 Rupees One Hundred Only	500.00 Rupees Five Hundred Only
	c) Sets above 20 HP	Hour	5.00	240.00 Rupees Two Hundred Forty Only	1,200.00 Rupees One Thousand Two Hundred Only
D311 Generator sets mounted on trolley including the cost of operator					
	a) Sets upto 5 Kva	Hour	5.00	240.00 Rupees Two Hundred Forty Only	1,200.00 Rupees One Thousand Two Hundred Only
	b) Sets 5-15 Kva	Hour	5.00	150.00 Rupees One Hundred Fifty Only	750.00 Rupees Seven Hundred Fifty Only
D312	Mobile Crane / Power winch including the cost of operator	Hour	5.00	2519.00 Rupees Two Thousand Five Hundred Nineteen Only	12,595.00 Rupees Twelve Thousand Five Hundred Ninety Five Only



SI. No.	Description	Unit	Quantity	Rate In Figure and Words	Amount In Figure and Words
D313	Bull Dozer 100/110 Hp including the cost of operator	Hour	5.00	100.00 Rupees One Hundred Only	500.00 Rupees Five Hundred Only
D314	Plate compactors including the cost of operator	Hour	5.00	206.00 Rupees Two Hundred Six Only	1,030.00 Rupees One Thousand Thirty Only
D315	Jack hammers for dismantling including the cost of operator	Hour	5.00	206.00 Rupees Two Hundred Six Only	1,030.00 Rupees One Thousand Thirty Only
D316	Utility Vehicles including the cost of driver	Hour	5.00	206.00 Rupees Two Hundred Six Only	1,030.00 Rupees One Thousand Thirty Only
D317	Mini Hot Mix Plant (5TPH) including the cost of operator	Hour	5.00	8000.00 Rupees Eight Thousand Only	40,000.00 Rupees Forty Thousand Only
					208,480.00
					Rupees Two Lakhs Eight Thousand Four Hundred Eighty Only
D318	Allow 0% (Zero Percent) of Subtotal for Contractor's overhead, profit, etc., in accordance with paragraph 3 (b) above			0.00%	-
					208,480.00
					Rupees Two Lakhs Eight Thousand Four Hundred Eighty Only