भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
National Highways Authority of India
(परियोजना कार्यान्वयन इकाई, पटना)
Project Implementation Unit, Patna

शिवपुरम कॉलोनी, हनुमान मंदिर के पास, सैनिक कॉलोनी रोड, गोला रोड, दानापुर, पटना - 801503
Shivpuram Colony, Near Hanuman Mandir, Sainik Colony Road, Gola Road, Danapur, Patna - 801503
Ph. : +91 612 3123598 | Email : patna@nhai.org, nhaipatna@gmail.com

No. NHAI/PIU-Patna/NOC/Utility/2024/Vol-II/714 Dated: 21.04.2025

INVITATION OF PUBLIC COMMENTS

Sub. Proposal for issuance of NOC for crossing of 1200 mm dia sewerage line for the work of rising main in Kankarbagh zone under Digha-Kankarbagh sewerage project at km 187+150 of Patna Bakhtiyarpur section of NH30.reg.

Ref.: बुडको / दी०क०/यो०-02/2021 (पार्ट-1)-65 dated 10.02.2025 (received on 07.04.2025).

This has reference to letter above vide which Project Director ,Digha and Kankarbagh , Sewarage Project ,BUIDCO has submitted the proposal for issuance of NOC for crossing of 1200 mm dia sewerage line for the work of rising main in Kankarbagh zone under Digha-Kankarbagh sewerage project at km 187+150 of Patna Bakhtiyarpur section of NH30 to this office.

2. Now, as per Ministry vide OM No. RW/NH-33044/29/2015/S&R(R) dated 22.11.2016, the Highway Administration will make available the proposal seeking permission for utility laying for public comments for 30 days on the ground of general public interest for seeking claims and objections.

3. Therefore, public comments are invited on the above proposal and the same must reach the below mentioned address by 20.05.2025, after which no comments will be considered.

Project Director
National Highway Authority of India
Project Implementation Unit-Patna,
Shivpuram, Sainik colony,
Near Hanuman Mandir.
Gola Road, Danapur,
Patna - 801503

Encl: As above

Yours faithfully,

(Arbinda Kumar)
Project Director

Copy to: -

(i) Web Admin, NHAI HQ, New Delhi - with request for uploading on NHAI website.
(ii) The Senior Technical Director, NIC, Transport Bhawan, New Delhi-110001- with a request for uploading on the Ministry website.
(iii) The Regional Officer, NHAI, Bihar at Patna - for kind information.
(iv) Project Director, Digha and Kankarbagh, Sewarage Project, BUIDCO - for information.

Re: Proposal for issuance of NOC for crossing of 1200 mm dia sewerage line for the work of rising main in Kankarbagh zone under Digha-Kankarbagh sewerage project at km 187+150 of Patna Bakhtiyarpur section of NH30.reg.

PATNA BAKHTIYARPUR <ie.patnabakhtiyarpur@gmail.com>

Mon 4/21/2025 7:07 PM

To:PIU Patna <patna@nhai.org>;

Cc:pbtl.patna@gmail.com <pbtl.patna@gmail.com>;

Dear Sir,

This is to inform you that a joint site inspection with the representative of BUIDCO was conducted on 21.04.2025. During the inspection, it was observed that the actual chainage of the proposal is at Km 187+150.

This is for your kind information and further necessary action please.

--

M/s Hexa Private Joint Stock Company JV with Casta

in association with Jaiman

1st floor, Computer Hub, At Tej Pratap Nagar,

Near New Bypass, P.S-Beur

Patna-800002, (Bihar)

Email ID: ie.patnabakhtiyarpur@gmail.com

On Mon, 21 Apr 2025 at 18:52, PIU Patna <patna@nhai.org> wrote:

> Sir,
>
> This has reference to letter above vide which Project Director ,Digha and Kankarbagh , Sewarage Project ,BUIDCO has submitted the proposal for issuance of NOC for crossing of 1200 mm dia sewerage line for the work of rising main in Kankarbagh zone under Digha-Kankarbagh sewerage project at km 187+150 of Patna Bakhtiyarpur section of NH30 to this office.
>
> 2. It is requested to review the proposal and submit necessary comments in this regard.
>
> With Regards,
>
> Project Director

National Highways Authority of India
Project Implementation Unit-Patna,
Shivpuram Colony, Near Hanuman Mandir,
Sainik Colony Road,
Gola Road, Danapur,
Patna-801503

Confirmation regarding NH-30 crossing near Bhoothnath Road crossing...

Executive Engineer <eedk.buidco@gmail.com>

Mon 4/21/2025 5:47 PM

To:PIU Patna <patna@nhai.org>; NHAI PIU,Patna <nhaipatna@gmail.com>;

Dear Sir,
This has reference to the meeting at your office dated 21/04/25.
Also, please refer to our earlier letter dated 10.02.2025 no.65 regarding the NOC sought from your good office.
In this regard , we once again re-confirming that we have planned to cross the NH-30 by Jack Pushing method.

Kindly do the needful.

Project Director
D.K Sewerage Project
BUIDCo, Patna, Bihar

बिहार शहरी आधारभूत संरचना विकास निगम लि0

Bihar Urban Infrastructure Development C[illegible]oration Ltd.
(A Govt. of Bihar Undertaking)
RajaPur Pui, West Boring Canal Road, Patna-800 001
Contact: + 0612- 2558412, E-mail-eedk.buidco@gmail.com, Website :http://buidco.in

पत्रांक– बुडको / दी०क० / यो०–02 / 2021 (पार्ट–1) – 65

दिनांक– 10.02.2025

सेवा में,

Project Director,
Project Implementation Unit,Patna
Patna, MoRT&H
D-63, Basant Bihar Colony, Sri Krishna Puri, Patna, Bihar 800001

विषय :– **दीघा–कंकड़बाग सीवरेज परियोजना अंतर्गत कंकड़बाग जोन में राईजिंग मेन के कार्य हेतु NOC निर्गत करने के संबंध में।**

प्रसंग :– संवेदक का पत्रांक–255, दिनांक–30.01.2025

महाशय,

उपर्युक्त विषयक प्रासंगिक पत्र के संबंध में कहना है कि दीघा–कंकड़बाग सीवरेज परियोजना के संवेदक VA [illegible] WABAG Ltd द्वारा योजना अंतर्गत कंकड़बाग जोन में 1200 mm dia Rising Main बिछाये जाने हेतु नंद लाल छपरा रोड की ओर योगीपुर नाले पर SPS B के पास एन0एच0–30 के 103 मीटर हिस्से को Cross करने लिए पथ कटिंग का अनापत्ति प्रमाण पत्र NHAI से प्राप्त करने हेतु अनुरोध किया गया हैं।

अनापत्ति प्रमाण पत्र प्राप्त करने हेतु निम्नलिखित दस्तावेज समर्पित किया गया है:–

1. Cutting Details(NHAI Road Crossing details)
2. Licence fee calculation details
3. Prevailing circle rates
4. Draft Undertaking
5. Checklist as pere MoRTH Guidline dated-22-11-2016
6. Cross-Sectional drawing
7. Sketch Details for Trenchless for NH Crossing
8. Approved Methodology for Trenchless pipe laying by Jack pushing method
9. Utility Survey report
10. L-Section Drawing for Rising main

आपको अवगत कराना चाहते हैं कि नमामि गंगे जैसी महत्त्वाकांक्षी योजना की नियमित रूप से समीक्षा PMO तथा जल शक्ति मंत्रालय, भारत सरकार द्वारा किया जा रहा है।

उक्त के आलोक में अनुरोध है कि कंकड़बाग जोन में 1200 mm dia Rising Main बिछाये जाने हेतु नंद लाल छपरा रोड की ओर योगीपुर नाले पर SPS B के पास एन0एच0–30 के 103 मीटर हिस्से को Cross करने लिए पथ कटिंग हेतु यथाशीघ्र अनापत्ति प्रमाण–पत्र निर्गत करने की कृपा की जाय ताकि नमामि गंगे जैसी केन्द्र सरकार की महत्वाकांक्षी योजना का कार्य ससमय एवं सुगमतापूर्वक पूर्ण किया जा सके।

अनुलग्नकः–यथोक्त।

विश्वासभाजन,

10/02/2025

परियोजना निदेशक,
दीघा एवं कंकड़बाग
सीवरेज परियोजना, बुडको

WABAG

An ISO 9001: 2000 Company

Ref.: WABAG/10P155N/255/24-25. Dated- 30.01.2025

To

The Project Director,

Digha Kankarbagh Project

Bihar Urban Infrastructure Development Corporation Limited

West Boring Canal Road, Patna-800001

Project: Development of Sewage Treatment Plant and Sewerage Network facilities in Digha & Kankarbagh Zone of Patna, Bihar

Sub: - Submission of proposal as per MORTH Guideline dated 22.11.2016 for obtaining NOC from NHAI for laying of Rising Main of Kankarbagh Zone

Ref.:
1. IFB No- IN-BUIDCO/YO-911/18-32 dated 15.05.2018
2. Concession Agreement dated 30.12.2019
3. Wabag letter no 340 07.11.2023
4. Wabag letter no 371 dated 29.11.2023
5. BUIDCo letter no 409 dated 30.11.2023
6. NHAI letter no 368 dated 02.04.2024
7. Wabag letter no 96 dated 09.08.2024
8. Wabag letter no 125 dated 03.10.2024
9. PE letter no 18130 dated 20.11.2024
10. Wabag letter no 209 dated 14.12.2024
11. Wabag letter no 222 dated 25.12.2024

Dear Sir,

In continuation to our letter no 222 dated 25.12.2024 and in accordance with the revised route alignment for 1200 mm dia Rising Main from Kankarbagh SPS B to STP approved by the Project Engineer vide letter no 18130 dated 20.11.2024, we would like to inform to inform your office that to lay this rising main line, we need permission/NOC for crossing 103 mtr stretch of NH 30 near SPS B at Yogipur Nalla towards Nand Lal Chapra road from NHAI PIU, Patna.

In view of the above, we are submitting herewith the proposal for obtaining NOC from NHAI PIU, Patna as per MORTH Guidelines dated 22.11.2016 for obtaining permission/NOC for NH 30 crossing. The following documents as per

WABAG

VA TECH WABAG LIMITED
ECOSTATION Business Tower,
17th Floor, Block BP 07, Sector V, Salt Lake City, Kolkata - 700091, India

VA TECH WABAG LIMITED
"WABAG HOUSE"
No.17, 200 Feet Radial Road,
S. Kolathur (Near Kamakshi Hospital)

MORTH Guidelines dated 22.11.2016 is enclosed for your good office kind review and necessary action for obtaining NOC from NHAI.

1. Cutting Details (NHAI Road Crossing Details)
2. Licence Fee Calculation details
3. Prevailing Circle rates
4. Draft Undertaking
5. Checklist as per MORTH Guidelines dated 22.11.2016
6. L Section Drawing for Rising Main under NHAI
7. Cross sectional drawing
8. Sketch Details for Trenchless for NH Crossing
9. Approved Methodology for Trenchless pipe laying by Jack pushing method
10. Utility Survey Report

Now, we request you good office to kindly take necessary action for earliest issuance of NOC for laying of 1200 mm dia. Rising Main from Kankarbagh SPS over Yogipur Nalla to Kankarbagh STP.

Thanking you and assuring you of our best services at all times.

For **VA TECH WABAG LIMTED**

VA TECH WABAG LTD.

Vilas Shinde

Construction Manager

Enclosure: As Above

CC/- 1. The Chief General Manager, BUIDCO

2. The Project Engineer, ACE

WABAG

VA TECH WABAG LIMITED

ECOSTATION Business Tower,

17th Floor, Block BP 07, Sector V, Salt Lake City, Kolkata - 700091, India

VA TECH WABAG LIMITED

"WABAG HOUSE"

No.17, 200 Feet Radial Road,

S. Kolathur (Near Kamakshi Hospital)

1. NHAI ROAD CROSSING DETAILS - KANKARBAGH RISING MAIN										
S N	Alligment	Name of Road	Type of Road	Type Of Pipe	Dia Of Pipe (mm)	Total Length		Jack Pushing		Remarks
						Length (Mtr.)	Width (Mtr)	Length (Mtr.)	W(Mtr)	Stake Holder Name
1	SPS-B to STP	NH 30 NH Crossing near SPS B at Yogipur Nalla location towards Nand Lal Chapra road	BT	MS & DI	1200	103	1.80	103	6 mtr.	Crossing work will be carried by Jack Pushing Method Road as per NHAI Guide line
Total (mtrs)						**103**		**103**		

Licence Fee Calculation Details								
Location	Type of land	Ch. Start	Ch. End	Length (m)	Dia of pipe (m)	Prevailing circle rate / Decimal	Prevailing circle rate / Sqm [HX 0.047157686604]	Total License Fees: (Utilized NH land area X Prevailing Circle rate of land in per Sqm) [C X E X I]
		[A]	[B]	[C]	[E]	[H]	[I]	[J]
Bhootnath road crossing towards Nandlal Chapra road	NH-30 (Crossing)	186.935	186.935	103.000	1.800	1397250	34534.11	6402623.58
Total				**103.000**				**6402623.58**
	License Fees For first year (L1) i.e. (Utilized NH land area X Prevailing Circle rate of land in per Sqm) *1.5%							96039.35
	License Fees for Second Year L2={L1+ (L1*6%)}							101801.71
	License Fees for Third Year L3= {L2+ (L2*6%)}							107909.82
	License Fees for Fourth Year L4= {L3+ (L3*6%)}							114384.41
	License Fees for Fifth Year L5= {L4+ (L14*6%)}							121247.47
	Licensee Fee For Public Utility for 5 Years as per Circular No: NH-36094/01/2022-S&R(P&B)dated 24/04/2023							₹ **541,383**
	Performance bank guarantee = running length X rate per Meter (Rs 250/- the dia is > 300mm):Subtotal **Across**							25,750
	Total Amount of Bank Garuntee to be furnished by BUIDCO							₹ **25,750**

MVR Details

Registration Office : PATNA CITY(2801)
Circle Name : PATNA CITY
Thana Code : Agamkuan/220
Land Type : --SELECT-- Advance Calculation

Land Code	Land Name	Unit	Minimum Value	Reg. Fee	SD	ASD
04	Comm. Branch Road	Decimal	1181250 /-	23625/-	70875/-	-N/A-
03	Comm. Main Road	Decimal	1397250 /-	27945/-	83835/-	-N/A-
12	Comm. Princ. Road	Decimal	2430000 /-	48600/-	145800/-	-N/A-
02	Res. Branch Road	Decimal	850000 /-	17000/-	51000/-	-N/A-
01	Res. Main Road	Decimal	1068750 /-	21375/-	64125/-	-N/A-

NOTE: The registration fee is being indicated for 1 unit of land where the unit is as listed in column 3.
SD - Stamp Duty.
ASD - Additional Stamp Duty.
N/A - Data Not Available.

DISCLAIMER: Please note that the Registration Fees, Stamp-Duty and Additional Stamp-Duty are purely indicative figures only. The actual value of such fees and duties can only be calculated upon presentation of relevant papers at the District Sub-Registry Office.

UNDERTAKING

I/We hereby certify that following terms and condition will be adhere to during the laying of Distribution Network Rising Main Pipeline work in Patna City (Project underground pipeline).

1. The Underground Rising main Pipeline shall be laid in strict observance of the norms prescribed for the purpose and in compliance with the instruction to be obtained from the project director of concerned highway authority.
2. The underground Rising main Pipeline will not be interfered with the public utility service, if any.
3. Adequate arrangement for cautioning by way of caution board during the daytime danger light at night will be provided by the concerned department.
4. The width of digging trench should be kept to minimum. After completion of work the trench shall be filled up by the department and compacted to satisfaction of the Engineer-in-charge.
5. No avenue trees shall be felled or trimmed except special permission of the highway authority. The concerned department shall indemnify the highway authority from all danger, if any, due to the laying of the Rising Main pipeline.
6. Concerned depart should notify the concern engineer-in-charge at least 15 days in advance before digging trenches along the roadsides.
7. If the repairing work of digging portion is not up to the satisfaction of the engineer-in-charge, the highway authority will repair the same and the cost for that purpose will entirely be borne by the concerned department.
8. In case of necessity, the underground Rising main Pipeline will be shifted at our own cost and risk within 60 days of receipt of such notice from the NHAI.
9. The underground Rising main Pipeline shall be as close to the extreme edge of the right -of- way as possible but not less than 15 meter from the centre line of the nearest carriage way.
10. The underground Rising main Pipeline shall not be permitted to run along the national highway when the road formation is situated in double cutting. Nor shall these be led over the existing culverts and bridges without the prior approval of government of India.
11. The underground Rising main Pipeline shall be so placed that at no time there is interference with the maintenance of the National Highways.
12. These should be so laid their top is at least 0.6mts. Below ground level or as otherwise directed by the highway authority so as not to obstruct drainage of the road land.
13. We do undertake that we shall take prior approval of RCD Dept.before starting or undertaking any work of installation, shifting or repairs or alteration to the gas pipeline located in national highways right of the ways.
14. We undertake that if the concessionaire towards any raises any claim damage any other region there of then the same shall be paid by us.
15. We shall undertake that we shall bear the expenditure, if any, incurred by NHAI for repairing any damage caused to the national highway by laying, maintenance or shifting of the Rising main Pipeline.

16. We undertake that no claim shall be made by the agency in case of revenue loss/any other losses/insurance etc. at the time of shifting the gas pipeline.
17. We do undertake that while laying of the gas pipeline across national highway we shall take care of the existing utilities and service lines that have been previously laid. In case of any damage, we shall pay the necessary repair charges either to NHAI or to the concerned agency.
18. We do undertake that we are agreeable to the terms and conditions laid in the draft.
19. Agreement and here by confirm the signing of the agreement within 30 days of receipt of the approval from NHAI we also confirm the agreement deposit of the statutory fees /user charges/bank guarantee as applicable and agreed in the agreement at the time of signing of the agreement. We also undertake that bank guarantee shall be renewal as and when required as directed by NHAI.
20. We do undertake that we shall follow and abide by all that standard conditions of ministry circulars and NHAI guidelines regarding laying of the pipelines in the national highway land.
21. We do undertake that we shall manage and control the ongoing traffic movement while laying our underground Rising main Pipeline. We shall carry our pipeline laying work without hampering on going traffic.

Signature of

Project Director, BUIDCO
Digha & Kankarbagh Sewerage Project

POWER OF AUTTORNEY

This is to certify that Mr. Rajeev Deo, Project Director, Digha & Kankarbagh Project, BIHAR URBAN INFRASTRUCTURE DEVELOPMENT CORPORATION LTD (BUIDCO) has been authorized to coordinate with National Highway Authority of India, Railway Line, RCD, WRD, etc. for obtaining permission/NOC for laying of Rising Main Pipeline from Kankarbagh SPS B to Kankarbagh STP in Patna, Bihar. Signature of Mr. Rajeev Deo is attested below.

Signature of

Project Director, BUIDCO
Digha & Kankarbagh Sewerage Project

Check- List

Guidelines for processing the proposal for laying of utility line (Sewerage pipeline) in the land across National Highway vested with MoRT&H.

General Information

1	**Name and Address of the Applicant/Agency:**	Project Director (Digha & Kankarbagh Sewerage Project) BUIDCo.
2	**National Highway No.**	NH 30
3	**State**	Bihar
4	**Location**	Near Yogipur Nalla towards Nandlal Chapra
5	**Chainage in km**	186.935
6	**Length in m**	Jack Pushing - 103 Mtr.
7	**Width of available ROW on Both Slide**	
8	**Side of NH**	Left or right of NH towards increasing chain-age/Km direction
9	**Name of Highway Authority of MoRT&H/PWD/BRO**	MoRT&H
10	**Highway Administration address**	Executive Engineer PIU, Patna

ANNEXURE – C

Estimated cost to be paid by BUIDCo. To MoRT&H

1.	**NH Right of Way (m)**	**Crossing**
2.	**Dia of Carrier Pipe (mm)**	1200 mm DI Pipe
3	**Dia of Cashing Pipe (mm)**	1800 mm MS Pipe
4	**Dia of OFC (m)**	NIL
5	**Total Width of the utility**	1800 mm
6	**Utilized NH Land Area (Sq.m)**	185.4 Sqm
7	**Utilized NH Land Area (Decimal)**	1.891 Decimal
8	**Prevailing Land rate per decimal (Annexure I)**	Rs. 1397250
9	**Prevailing Land rate per sq. m**	Rs. 34534.11

As per MoRT&H, Circular no F. No. RW/NH-33044/29/2015/S&R Dated 22.11.2016

1	License Fees (Rs./Sqm./MoRT&H) = (Utilized NH Land Area * Prevailing Circular rate of land per unit area/(10*12)	Rs. 64,02,623/-
2	License fee for 5 years.	Rs. 541,383/-
3	License fee payable = 33% of calculated for public utilities (Point No.5 of the circular)	NA
4	Amount of Bank Guarantee to be furnished by BUIDCo., UD&HD for period of 1 Year (Point no 6 of the circular i.e. Rs 25,750/-)	Rs. 25,750/-

S No	Item	Measurement Observation as per Site Conditions	MoRT&H Norms	Whether complying with MoRT&H Norms
1	Details of already laid utility service, if any	No	Enclosed	
2	Whether up gradation of the Stretch in near future is proposed or not	No		
3	Laying of the utility service along the National Highways	No		
3.1	Location of proposed utility service along the stretch	As instructed by MorT&H	Utility Duct/beyond the Toe line of the embankment and drains, and close to the extreme edge of the Row.	
3.2	Depth of top utility service from ground level	NA	3.5 Mtr	
3.3	Mechanism for crossing water channel	NA	Trough utility duct (if provision exists) or beneath the bed of water channel	
3.4	Whether ROW is restricted in the stretch	No		
3.4.1	If yes, whether provision of land acquisition is required to lay utility.	NA		
	(a) If yes, whether undertaking for land acquisition along with relevant L.A details has been furnished.	NA		
3.4.2	Width of Concreate duct, if utility services are proposed to be laid in concrete ducts.	NA	Not less than one lane	
4	Laying of utility services across the NH	Yes		

4.1	Whether Existing drainage structures is allowed to carry the utility services.	No	Not to be allowed	
4.2	Proposed crossing of utility service		Perpendicular to NH	
4.3	Type of casing pipe/conduit carrying the utility line	MS Casing Pipe	Steel, Cast Iron, or reinforced cement concrete and have adequate strength	
4.4	Whether ends of the casing/conduit pipe are sealed from the outside.	Yes	Sealed	
4.5	Length of casing / conduit pipe crossing pipe	103*2=206 Mtr.	Extend from drain to drain in cuts and toe to toe of slope in the fills	
4.5.A	Length along with NH Service Lane	NA		
4.6	Depth of top of the casing/ conduit pipe	1.5 mtr	At least 1.2 m below the top of the sub grade	
4.7	Crossing method in case of CC pavements	Manual Jack Pushing	Only Boring method	
4.7.A	Laying method of NH service Lane			
4.8	Horizontal and vertical clearness in case utilities are allowed overhead.	NA	In accordance with IRC codes.	
5	Documents/Drawing enclosed with the proposal	Attached		
5.1	Cross-section showing the size of trench for open trenching method	NA	Enclosed, if applicable	
	(a) Trench Width	1.8 Mtr (Pipe OD-1.255 mtr)	More than 30 cm and less than 60 cm wider than the outer diameter of the utility pipe	
	(b) Filling of Trench	NA	As per Ministry Guidelines vide letter no RW/NH34044/29/2015/S&R	
	(a) Location of Trench	Enclosed	Extreme, if applicable	
5.2	Cross section showing the size of pit and location of the conduit of Jack Pushing method	Enclosed	Enclosed if applicable	
5.3	Strip plane/Route plan showing utility line, chainage, width of ROW, distance of proposed utility from the edge of ROW, important mile stone. Intersections, cross drainage works etc.	Enclosed	Enclosed	
5.4	Plane and profile drawing of stretch showing cross section of road at 20m distance along with ROW and proposed utility	Enclosed	Enclosed	
6	Method of laying of utility of utility line	Jack Pushing	Enclosed	

7	Draft license agreement is as per ministry guidelines vide letter NO RW/NH-34044/29/2015/S&R ® dated 22.11.2016 and signed by two witnesses			
8	License fees in Favor of MorT&H		Ministry's circular no. PAO/NH/Misc./2018-19/255-59 dated 19-08-2018	
9	Whether Bank Guarantees has obtained.		As per Ministry Guidelines vide letter no RW/NH-34044/29/2015/S&R	
	a). If yes, whether confirmation of BG has been obtained as per MoRTH/MORT&H guidelines			
10	Affidavit/undertaking from the applicant for			
10.1	Undertaking for not to damage other existing utility, if damage then to pay the losses to either to MoRTH/MORT&H or to the concern agency.	Enclosed		
10.2	Undertaking for renewal Bank Guarantees and when asked by MORTH/MOR&H	Enclosed		
10.3	Undertaking for shifting of utility as and when asked by MoRTH/MORT&H guideline	Enclosed		
10.4	Undertaking for indemnity against all damage and claims.	Enclosed		
10.6	Undertaking for management of traffic movement during laying of utility line without hampering the traffic	Enclosed		
10.7	Undertaking that if the Concessionaire/Contractors raise any claim then the same has to be paid by the applicant.	Enclosed		
10.8	Undertaking that the applicant has obtained various safety clearness from the represented authorities such as direction of Electricity, Chief controller of Explosives petroleum and explosive safety organization, Oil Industry Safety Directorate, State /Central Pollution Control Board and any other statutory clearance's applicable before applying to High way Administration	Enclosed		

The right of the Way (ROW) of the National Highway available at the proposed location from the center line of divided carriageway is 22m (from the center of ROW to edge of ROW towards proposed utility).

The above particulars along with the drawing and documents have been certified and certified as correct as per prevailing site conditions

Signature of

Project Director, BUIDCO
Digha & Kankarbagh Sewerage Project

ACE: P1012: 18228
January 8, 2025

The Project Director,
Digha & Kankarbagh Sewerage Project,
Buidco, Room no. 205 Rajapur Pul,
West Boring Canal Road
Patna, Bihar

Sir,

Sub: Development of Sewage Treatment Plants (STPs) & Sewerage networks for 15 years in Patna, State of Bihar- Recommended for approval with notes on L-section drawing for rising main routing - Kankarbagh SPS B - Revision 3 -reg.

Ref: 1. Concession agreement signed dated 30-12- 2019
2. WABAG Letter no. 125 dated 20-11-2024
3. ACE letter no. ACE:P1012:18130 dated 20-11-2024
4. WABAG Letter no. WABAG/10P55N/209/24-25 dated 14-12-2024
5. WABAG Transmittal no. 10P155-NWF-D/DT-CL-137 dated 08-01-2025

With reference to the above, please find our recommendation for approval with note for the document tabulated below for your perusal. We request you to instruct WABAG to do the needful and the concessionaire shall be advised to send the approved document / drawing for our reference:

Sl. No.	Drawing / Document No.	Drawing / Document Name	No. Sheet detail
1.	10P155-P0002-131	L-section drawing for rising main routing - Kankarbagh SPS B – R3	9

Thank you.

for Artelia Consulting Engineers Limited

Artelia Consulting Engineers Ltd. CHENNAI 600 002

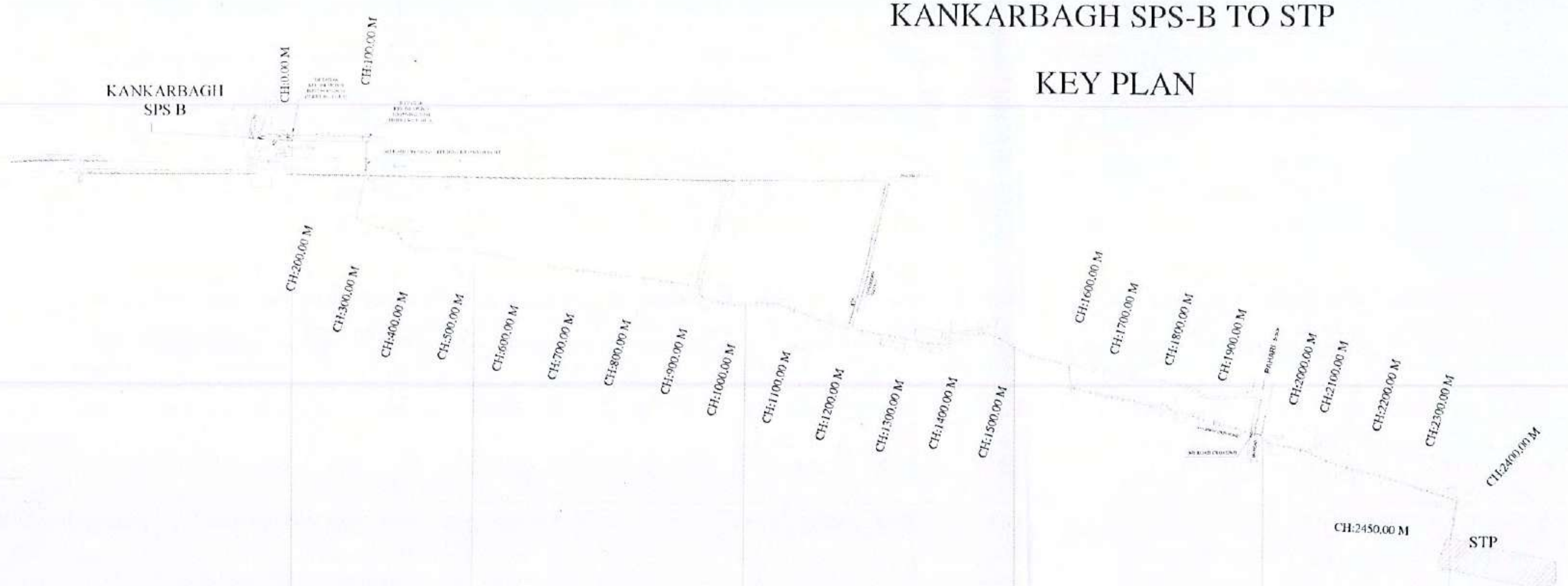
A. Srinivasan
Chief Operating Officer

Encl: Compliance Resolution Sheet.

CC : 1. The Executive Director – Project, NMCG
2. Mr. Rajat Kumar, NMCG
3. Dr. Pravin Kumar, Director , NMCG,
4. The Executive Director- Technical, NMCG
5. The Chief General Manager, BUIDCo.

KANKARBAGH SPS-B TO STP

KEY PLAN



FROM CHAINAGE - TO CHAINAGE	0.00 - 500.00	500.00 - 1000.00	1000.00 - 1500.00	1500.00 - 2000.00	2000.00 - 2450.00
FOR DETAIL REF DWG NO.	SHEET- 2	SHEET- 3	SHEET- 4	SHEET- 5	SHEET- 6

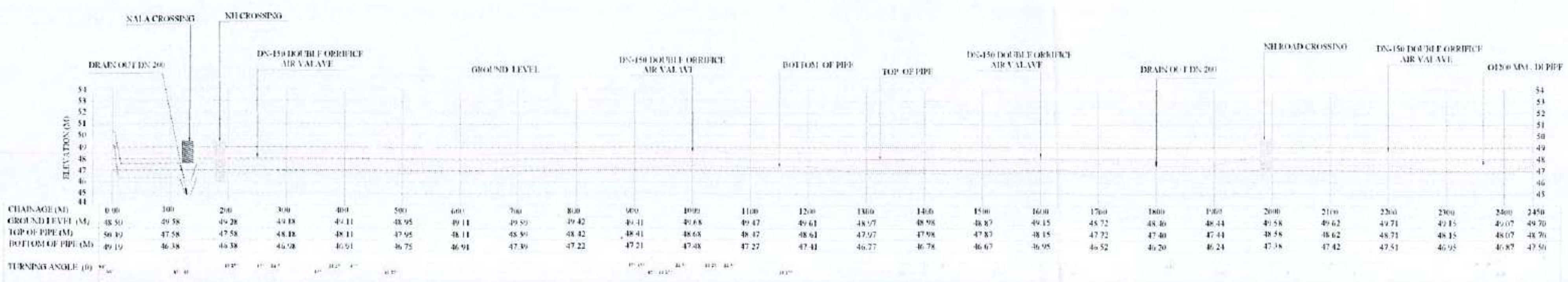
REFFRENCE DRAWING

SL. No.	DRAWING TITLE	DRAWING No
1	TOPOGRAPHICAL SURVEY DRAWING FOR RISING MAIN ROUTING - KANKARBAGH SPS B	10P155-C0001-108

NOTES :

1. ALL DIMENSIONS AND LEVELS ARE IN METER
2. LOCATION OF HORIZONTAL TURNING IN PLAN AND VERTICAL TURNING IN SECTION ARE TENTATIVE IT MAY CHANGE AS PER SITE CONDITIONS
3. PIPE BEDDING SHALL BE PROVIDED AS PER THE (IS 12288 1987)
4. VALVE LOCATION AND BEND LOCATION SHALL BE ADJUSTED SUIT TO THE SITE
5. THRUST BLOCK SHALL BE PROVIDED EACH BEND LOCATION AS PER THE DRAWING NO 10P155-P0002-131_7-OF 9

LEGENDS :



L-SECTION

DEVELOPMENT AND OPERATIONS OF SEWAGE TREATMENT PLANTS AND SEWERAGE NETWORK AT PATNA - BIHAR

NATIONAL MISSION FOR CLEAN GANGA

BIHAR URBAN INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED

MAHINDRA CONSULTING ENGINEERS LIMITED,MACE

DK SEWAGE PROJECT PRIVATE LIMITED

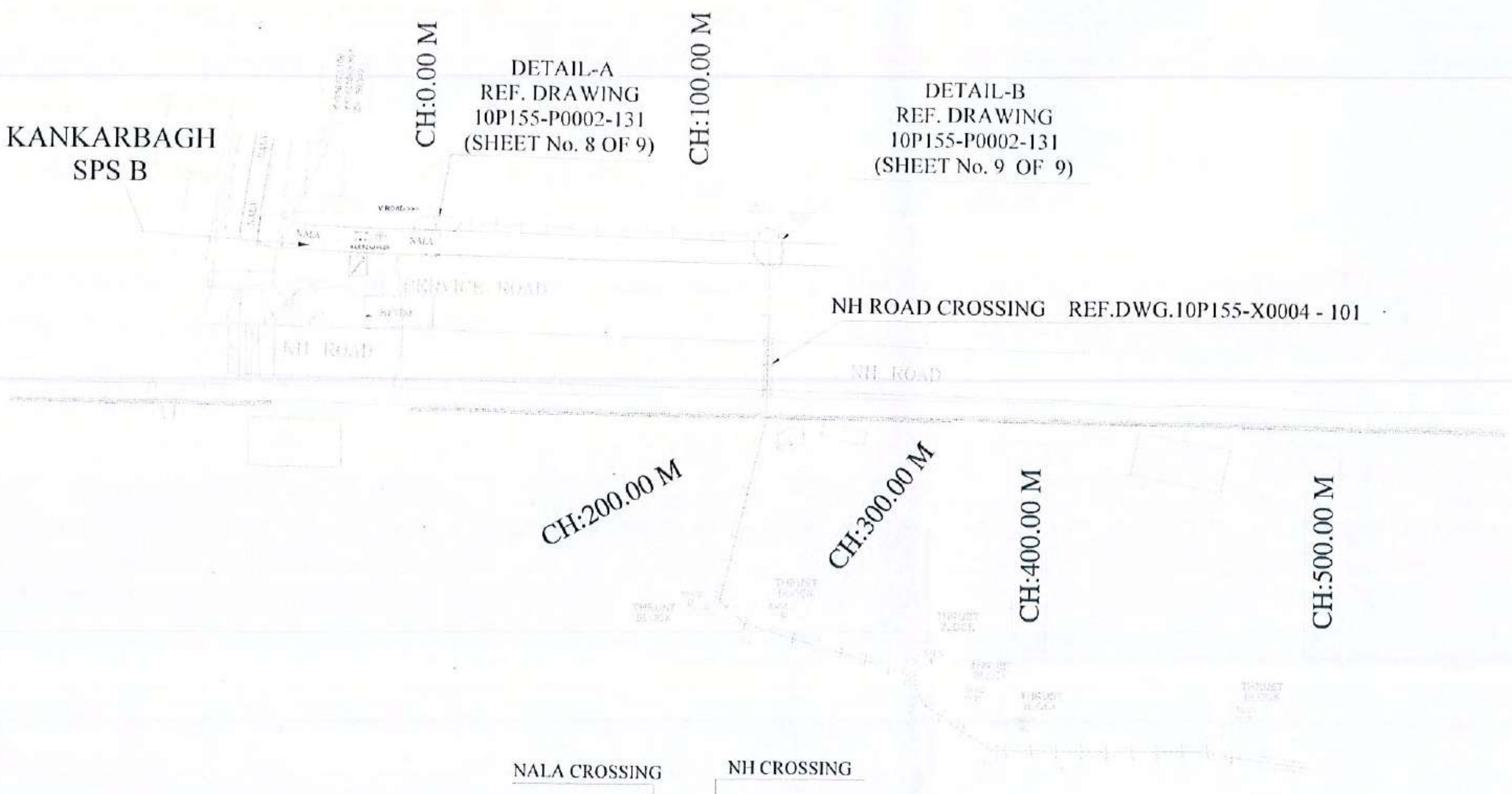
L SECTION DRAWING FOR RISING MAIN ROUTING - KANKARBAGH SPS B KEY PLAN

	NAME	DATE
PREPARED	RS	30.11.2024
CHECKED	FS	02.12.2024
APPROVED	SS	02.12.2024

WABAG

VA TECH WABAG
WABAG HOUSE
THORAIPAKKAM MAIN ROAD,
CHENNAI-600117

SCALE	DWG NO	SHEET	REV
NTS	10P155-P0002-131	1 OF 9	R3



REFERENCE DRAWING

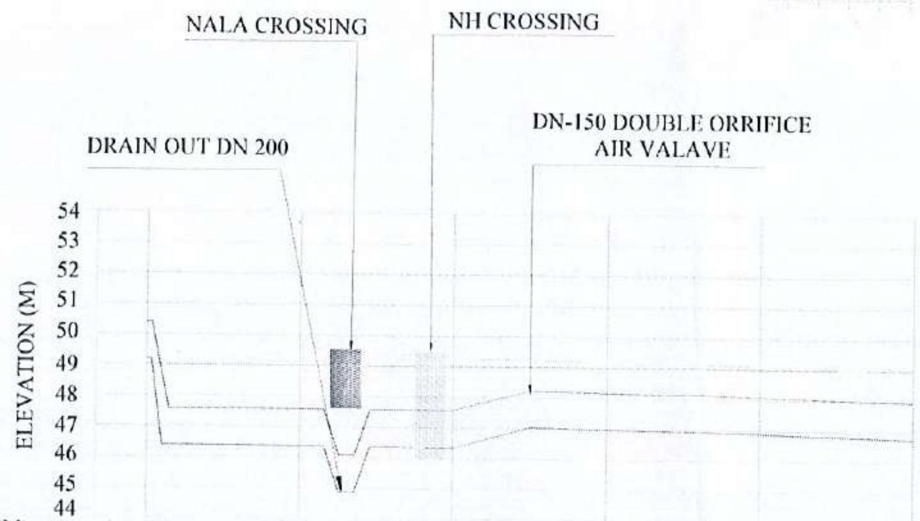
SL. No.	DRAWING TITLE	DRAWING No.
1	TOPOGRAPHICAL SURVEY DRAWING FOR RISING MAIN ROUTING - KANKARBAGH SPS B	10P155-C0001-108

NOTES :

1. ALL DIMENSIONS AND LEVELS ARE IN METER.
2. LOCATION OF HORIZONTAL TURNING IN PLAN AND VERTICAL TURNING IN SECTION ARETENTATIVE. IT MAY CHANGE AS PER SITE CONDITIONS.
3. PIPE BEDDING SHALL BE PROVIDED AS PER THE (IS 12288:1987)
4. VALVE LOCATION AND BEND LOCATION SHALL BE ADJUSTED SUIT TO THE SITE
5. THRUST BLOCK SHALL BE PROVIDED EACH BEND LOCATION AS PER THE DRAWING NO. 10P155-P0002-131_7-OF 9

LEGENDS:

SYMBOL	DESCRIPTION
	[illegible]



CHAINAGE (M)	0.00	100	200	300	400	500
GROUND LEVEL (M)	48.50	49.58	49.28	49.18	49.11	48.95
TOP OF PIPE (M)	50.39	47.58	47.58	48.18	48.11	47.95
BOTTOM OF PIPE (M)	49.19	46.38	46.38	46.98	46.91	46.75
TURNING ANGLE (0)	90° 90°	45° 45°	11.25° 45° 22.5°	45°	11.25° 45°	11.25°

L-SECTION

DEVELOPMENT AND OPERATION OF SEWAGE TREATMENT PLANTS AND SEWERAGE NETWORK AT PATNA - BIHAR

NATIONAL MISSION FOR CLEAN GANGA

BIHAR URBAN INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED

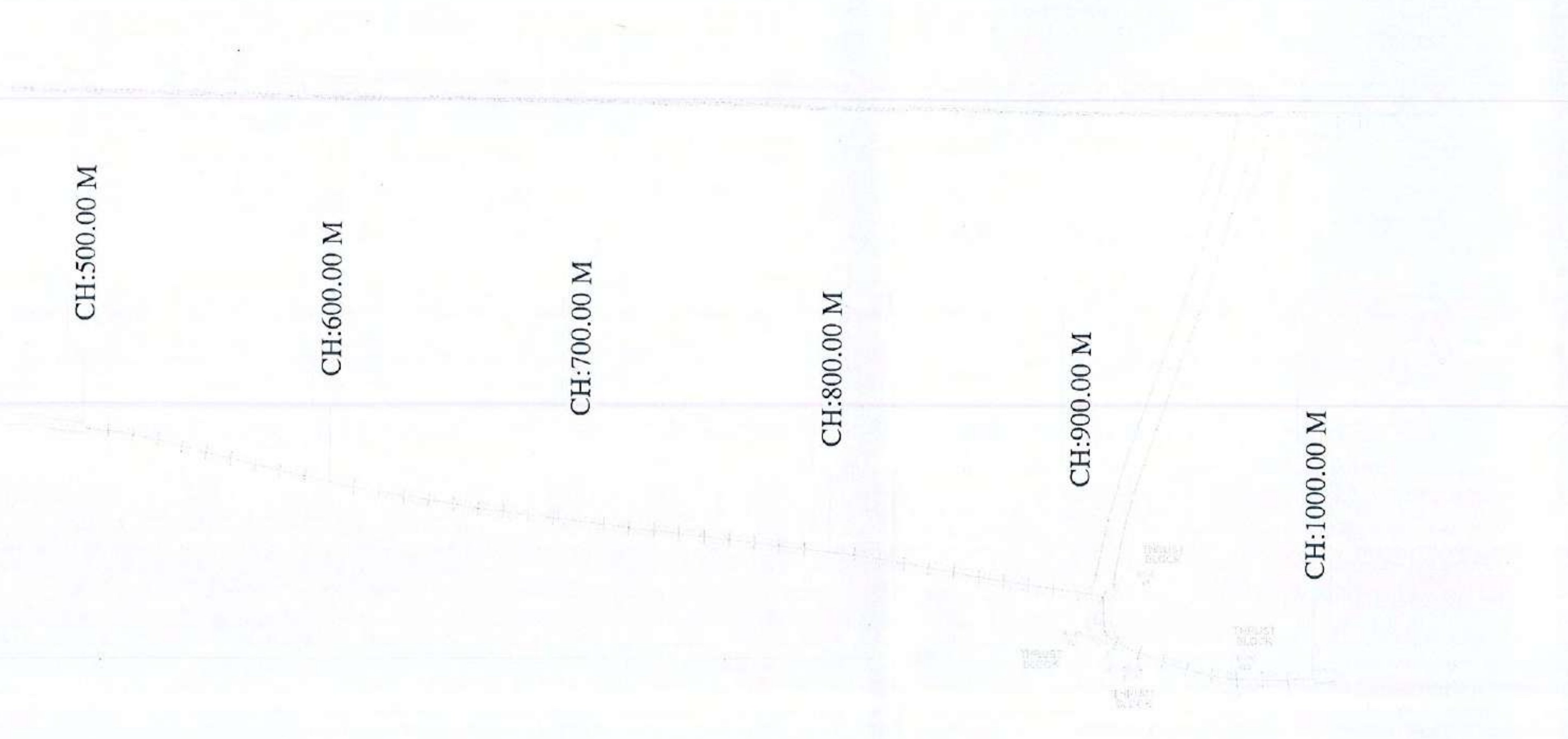
DK SEWAGE PROJECT PRIVATE LIMITED

L-SECTION DRAWING FOR RISING MAIN ROUTING - KANKARBAGH SPS B

WABAG

VA TECH WABAG
WABAG HOUSE
THORAIPAKKAM MAIN ROAD,
CHENNAI-600117

SCALE	DOC NO.	SHEET	REV
NTS	10P155-P0002-131	2 OF 9	R3



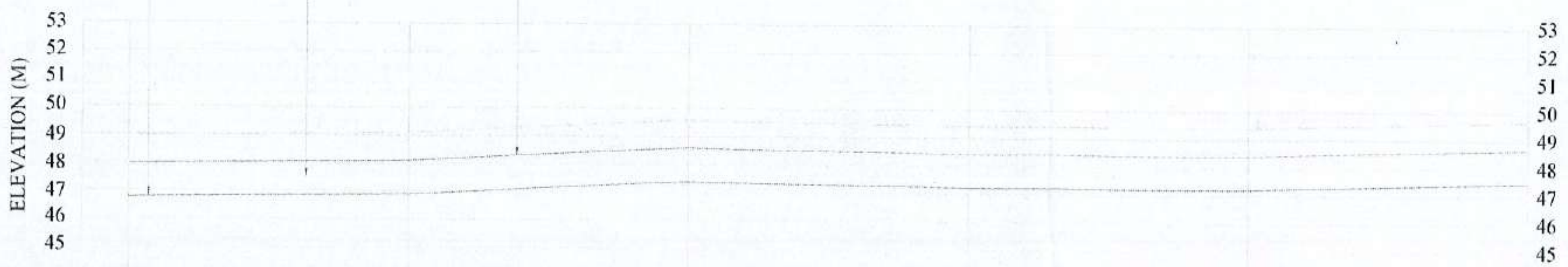
REFFRENCE DRAWING

SL. No.	DRAWING TITLE	DRAWING No.
1	TOPOGRAPHICAL SURVEY DRAWING FOR RISING MAIN ROUTING - KANKARBAGH SPS B	10P155-C0001-108

NOTES :

1. ALL DIMENSIONS AND LEVELS ARE IN METER
2. LOCATION OF HORIZONTAL TURNING IN PLAN AND VERTICAL TURNING IN SECTION ARETENTATIVE. IT MAY CHANGE AS PER SITE CONDITIONS.
3. PIPE BEDDING SHALL BE PROVIDED AS PER THE (IS 12288:1987)
4. VALVE LOCATION AND BEND LOCATION SHALL BE ADJUSTED SUIT TO THE SITE
5. THRUST BLOCK SHALL BE PROVIDED EACH BEND LOCATION AS PER THE DRAWING NO. 10P155-P0002-131_7-OF 9

LEGENDS



CHAINAGE (M)	500	600	700	800	900	1000
GROUND LEVEL (M)	48.95	49.11	49.59	49.42	49.41	49.68
TOP OF PIPE (M)	47.95	48.11	48.59	48.42	48.41	48.68
BOTTOM OF PIPE (M)	46.75	46.91	47.39	47.22	47.21	47.48
TURNING ANGLE (0)					90° 45° 11.25°	22.5°

L-SECTION

NATIONAL MISSION FOR CLEAN GANGA

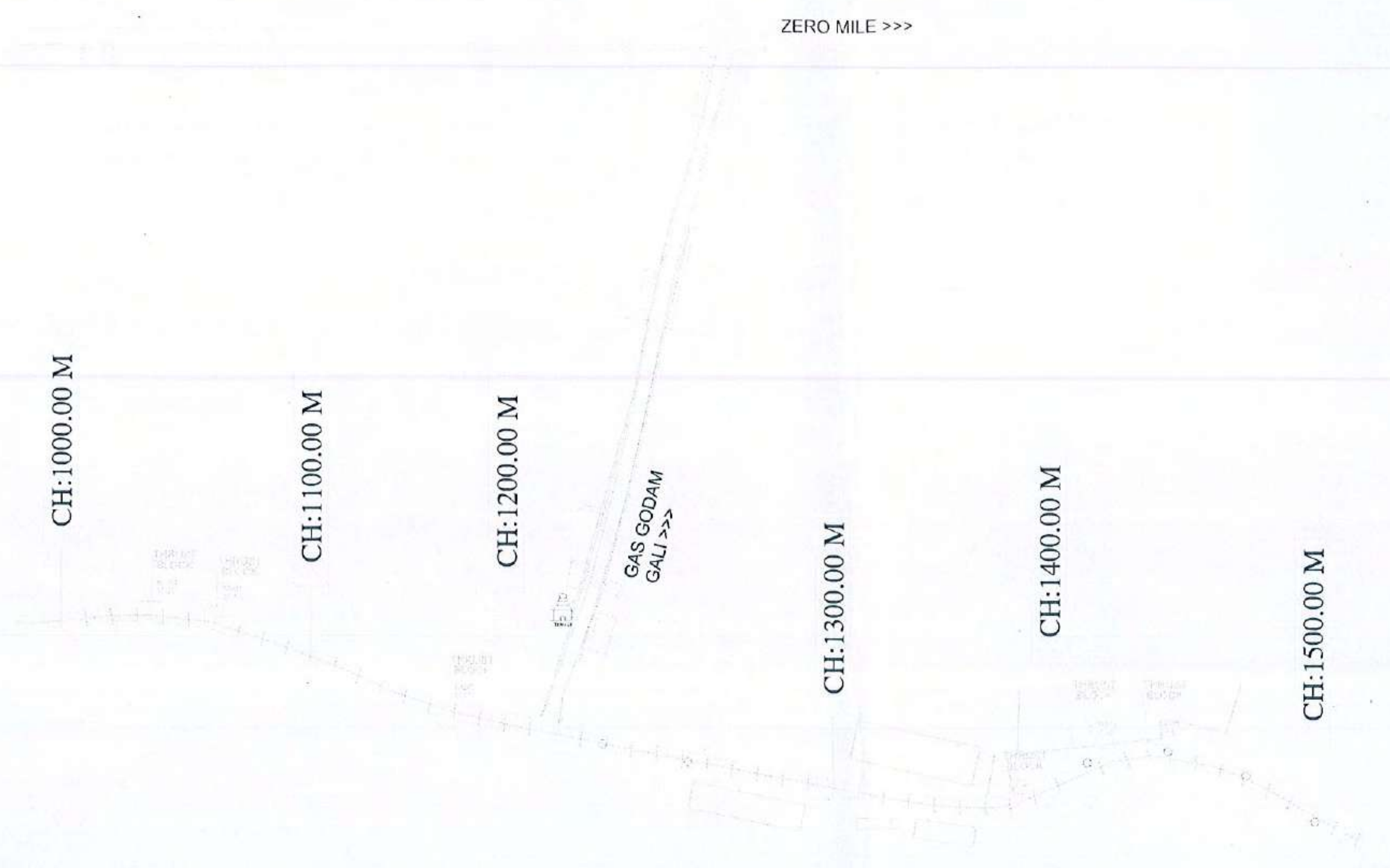
BIHAR URBAN INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED

WABAG

VA TECH WABAG

WABAG HOUSE

DOC. NO.	SHEET	REV
10P155-P0002-131	3 OF 9	R3



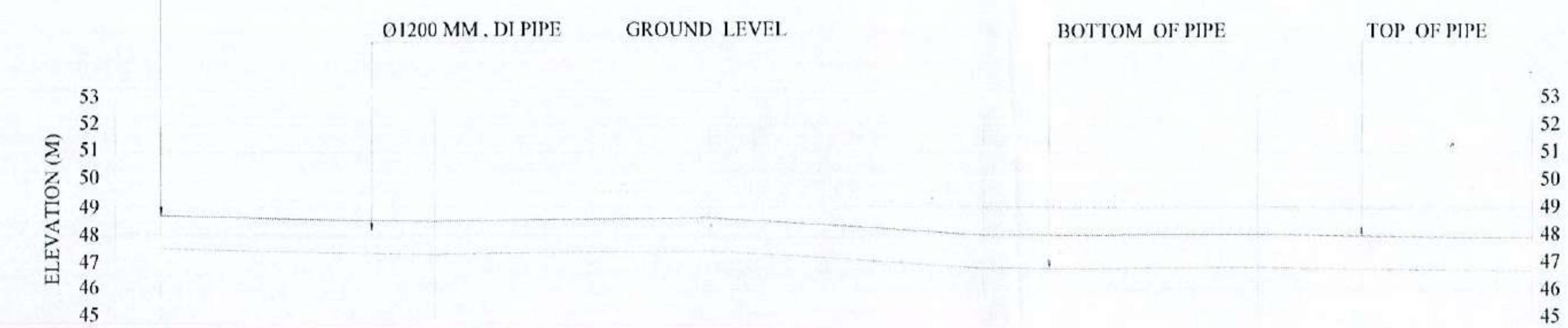
REFERENCE DRAWING

SL. No.	DRAWING TITLE	DRAWING No.
1	TOPOGRAPHICAL SURVEY DRAWING FOR RISING MAIN ROUTING - KANKARBAGH SPS B	10P155-C0001-108

NOTES :

1. ALL DIMENSIONS AND LEVELS ARE IN METER
2. LOCATION OF HORIZONTAL TURNING IN PLAN AND VERTICAL TURNING IN SECTION ARETENTATIVE. IT MAY CHANGE AS PER SITE CONDITIONS.
3. PIPE BEDDING SHALL BE PROVIDED AS PER THE (IS 12288 1987)
4. VALVE LOCATION AND BEND LOCATION SHALL BE ADJUSTED SUIT TO THE SITE
5. THRUST BLOCK SHALL BE PROVIDED EACH BEND LOCATION AS PER THE DRAWING NO. 10P155-P0002-131_7-OF 9

LEGENDS



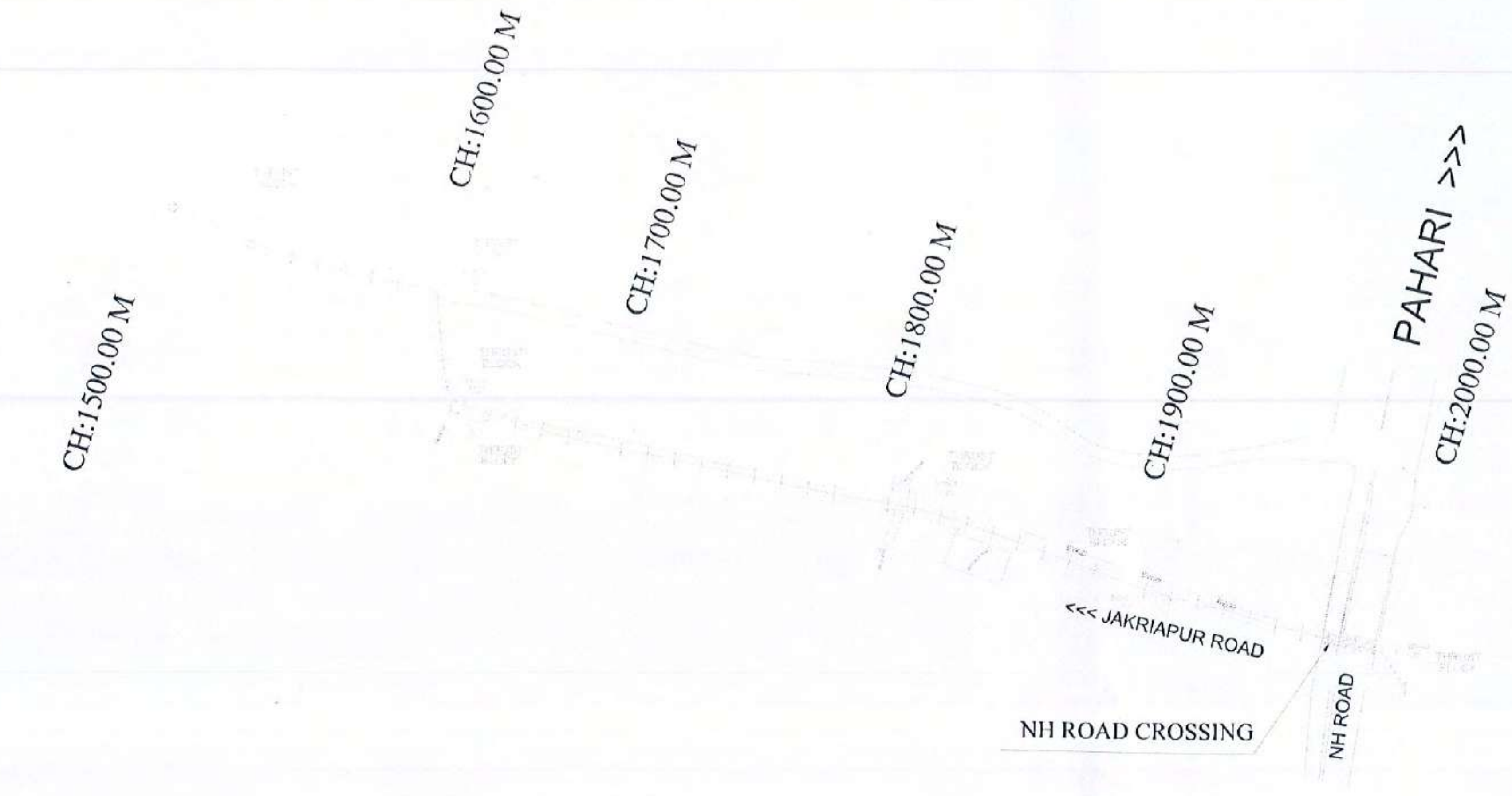
CHAINAGE (M)	1000	1100	1200	1300	1400	1500
GROUND LEVEL (M)	49.68	49.47	49.61	48.97	48.98	48.87
TOP OF PIPE (M)	48.68	48.47	48.61	47.97	47.98	47.87
BOTTOM OF PIPE (M)	47.48	47.27	47.41	46.77	46.78	46.67

TURNING ANGLE (0) 11.25° 22.5° 11.25° 11.25° 22.5° 11.25°

L-SECTION

WABAG

SCALE	DWG NO	SHEET	REV
NTS	10P155-P0002-131	4 OF 9	R3



REFERENCE DRAWING

SL. No.	DRAWING TITLE	DRAWING No.
1	TOPOGRAPHICAL SURVEY DRAWING FOR RISING MAIN ROUTING - KANKARBAGH SPS B	10P155-C0001-108

NOTES :

1. ALL DIMENSIONS AND LEVELS ARE IN METER
2. LOCATION OF HORIZONTAL TURNING IN PLAN AND VERTICAL TURNING IN SECTION ARETENTATIVE. IT MAY CHANGE AS PER SITE CONDITIONS.
3. PIPE BEDDING SHALL BE PROVIDED AS PER THE (IS 12288 1987)
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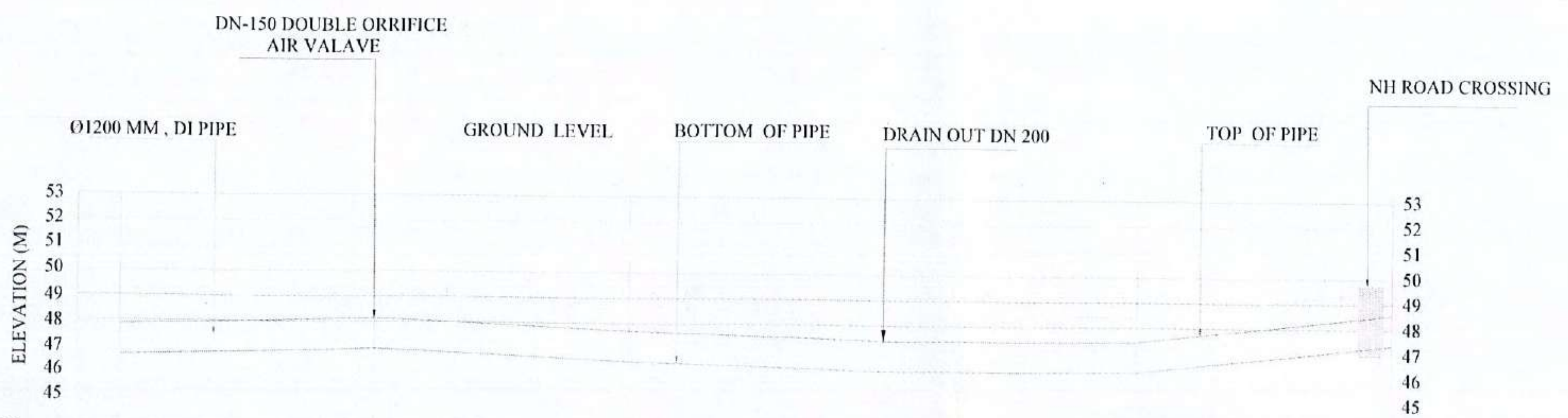
5. THRUST BLOCK SHALL BE PROVIDED EACH BEND LOCATION AS PER THE DRAWING NO. 10P155-P0002-131_7-OF 9

LEGENDS



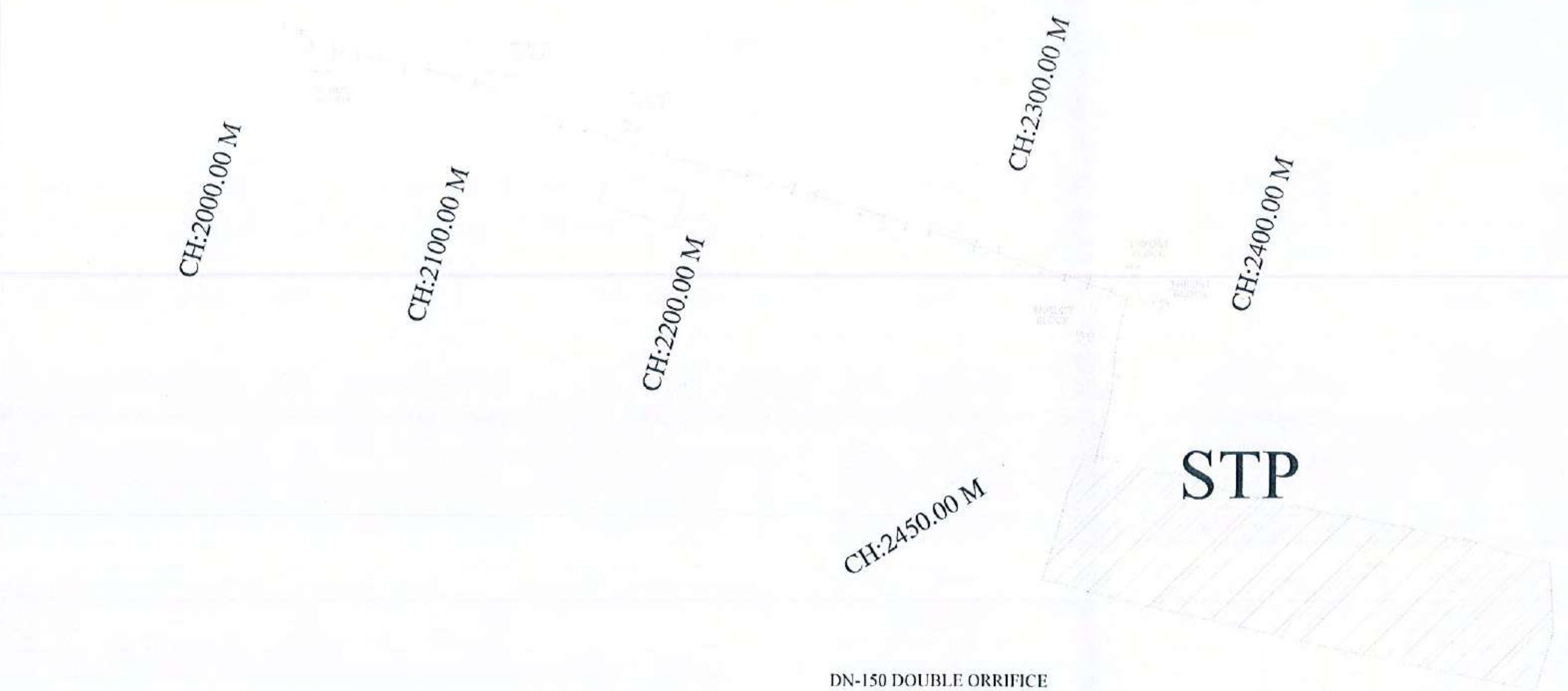
CHAINAGE (M)	1500	1600	1700	1800	1900	2000
GROUND LEVEL (M)	48.87	49.15	48.72	48.40	48.44	49.58
TOP OF PIPE (M)	47.87	48.15	47.72	47.40	47.44	48.58
BOTTOM OF PIPE (M)	46.67	46.95	46.52	46.20	46.24	47.38

TURNING ANGLE (0)

L-SECTION

WABAG

10P155-P0002-131 | 5 OF 9 | R3



REFERENCE DRAWING

SL. No.	DRAWING TITLE	DRAWING No.
1	TOPOGRAPHICAL SURVEY DRAWING FOR RISING MAIN ROUTING - KANKARBAGH SPS B	10P155-C0001-108

NOTES :

1. ALL DIMENSIONS AND LEVELS ARE IN METER
2. LOCATION OF HORIZONTAL TURNING IN PLAN AND VERTICAL TURNING IN SECTION ARETENTATIVE IT MAY CHANGE AS PER SITE CONDITIONS.
3. PIPE BEDDING SHALL BE PROVIDED AS PER THE (IS 12288 1987)
4. VALVE LOCATION AND BEND LOCATION SHALL BE ADJUSTED SUIT TO THE SITE
5. THRUST BLOCK SHALL BE PROVIDED EACH BEND LOCATION AS PER THE DRAWING NO. 10P155-P0002-131_7-OF 9

LEGENDS :

CHAINAGE (M)	2000	2100	2200	2300	2400	2450
GROUND LEVEL (M)	49.58	49.62	49.71	49.15	49.07	49.70
TOP OF PIPE (M)	48.58	48.62	48.71	48.15	48.07	48.70
BOTTOM OF PIPE (M)	47.38	47.42	47.51	46.95	46.87	47.50
TURNING ANGLE (0)						

L-SECTION

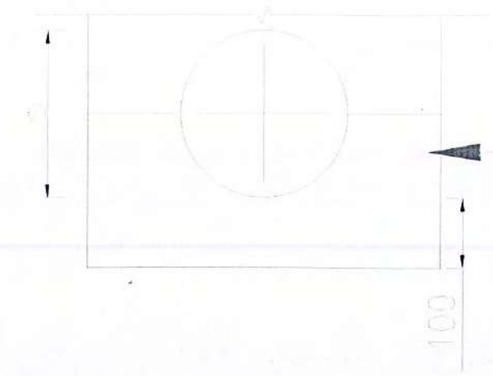
DEVELOPMENT AND OPERATIONS OF SEWAGE TREATMENT PLANTS AND SEWERAGE NETWORK AT PATNA, BIHAR

NATIONAL MISSION FOR CLEAN GANGA

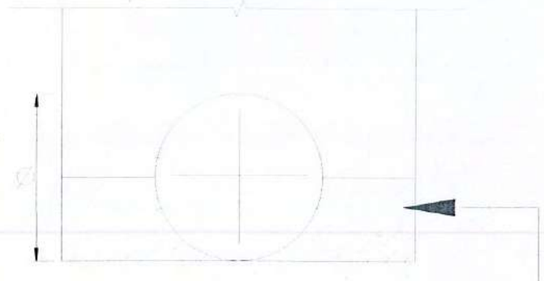
WABAG

DRAWING No.	SHEET	REV
10P155-P0002-131	6 OF 9	R3

BEDDING FOR DI PIPE



BEDDING FOR HARD SOIL OR ROCK



BEDDING FOR NORMAL SOIL

EARTH FILL OF PARTICLE
SIZE NOT GREATER THAN 25MM

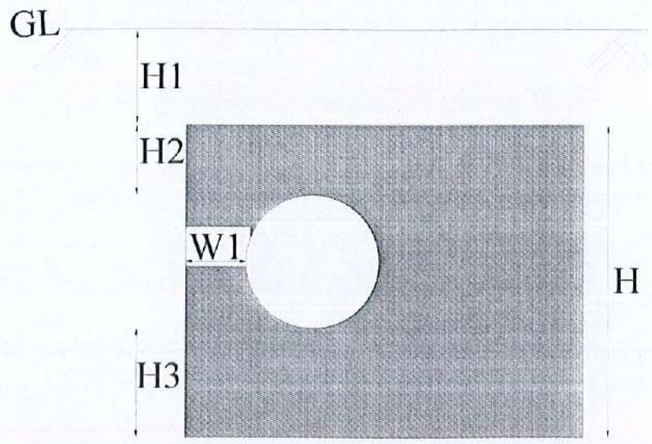
REFERENCE DRAWING

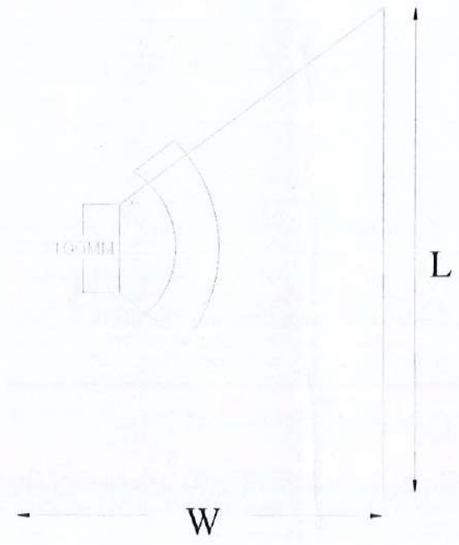
SL No.	DRAWING TITLE	DRAWING No.
1	TOPOGRAPHICAL SURVEY DRAWING FOR RISING MAIN ROUTING - KANKARBAGH SPS B	10P155-C0001-I08

NOTES :

1. ALL DIMENSIONS AND LEVELS ARE IN METER
2. LOCATION OF HORIZONTAL TURNING IN PLAN AND VERTICAL TURNING IN SECTION ARE TENTATIVE. IT MAY CHANGE AS PER SITE CONDITIONS.
3. PIPE BEDDING SHALL BE PROVIDED AS PER THE (IS 12288-1987)
4. VALVE LOCATION AND BEND LOCATION SHALL BE ADJUSTED SUIT TO THE SITE

THRUST BLOCK DETAILS





NOTES :

1. Surface L shall be finished to the undisturbed ground or unless compacted soil.
2. Concrete grade shall be 25 N/mm .

PRESSURE	6 BAR				
DIAMETER	DIMENSION	ANGLE			
		90	45	22.5	11.25
DN 1200	H2	0.60	0.60	0.60	0.60
	H3	0.85	0.85	0.85	0.85
	H	2.70	2.70	2.70	2.75
	L	5.50	2.50	1.25	0.60
	W	3.00	3.00	3.00	3.00
	W1	0.30	0.30	0.30	0.30
DN 500	H2	0.50	0.50	0.50	0.50
	H3	0.35	0.35	0.35	0.35
	H	1.40	1.40	1.40	1.40
	L	2.50	1.30	0.65	0.35
	W	1.50	1.50	1.50	1.50
	W1	0.20	0.20	0.20	0.20
DN 400	H2	0.50	0.50	0.50	0.50
	H3	0.25	0.25	0.25	0.25
	H	1.20	1.20	1.20	1.20
	L	2.00	1.10	0.55	0.30
	W	1.20	1.30	1.30	1.30
	W1	0.20	0.20	0.20	0.20

WABAG

10P155-P0002-131

SHEET 7 OF 9

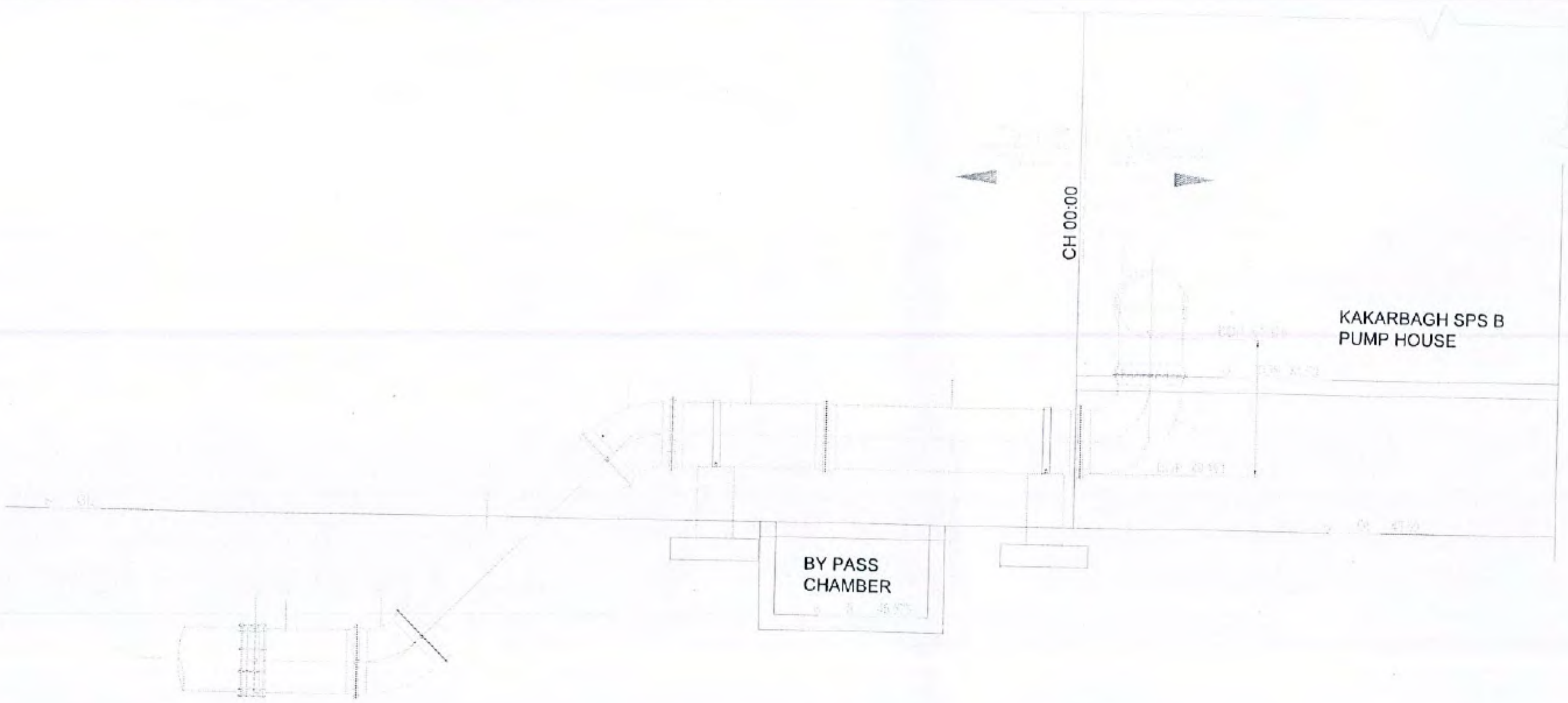
REV R0

REFERENCE DRAWING

SL. No.	DRAWING TITLE	DRAWING No.
1	TOPOGRAPHICAL SURVEY DRAWING FOR RISING MAIN ROUTING - KANKARBAGH SPS B	10P155-C0001-108

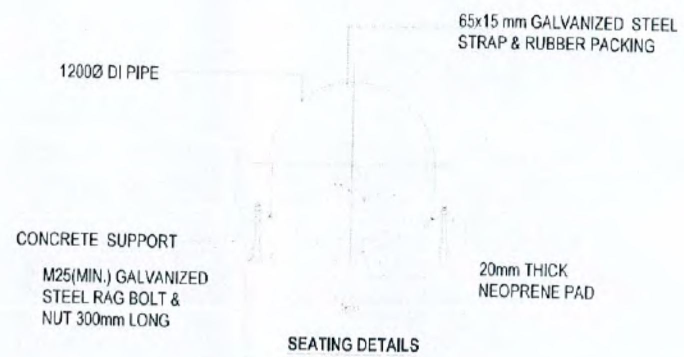
NOTES :

1. ALL DIMENSIONS AND LEVELS ARE IN MM.
2. REFER THE CIVIL DRAWINGS FOR STRUCTURAL DETAIL.
3. FLANGED PIPE ORIENTATION SHALL BE CHANGED SUIT TO SITE.



SCHEDULE OF PIPES AND FITTINGS

ITEM NO.	DESCRIPTION	QUANTITY
01.	DN 1200 DI Flange P/E Pipe (2.0m Length)	01 Nos.
02.	DN 1200 DI Double Flange Pipe (5.0m Length)	02 Nos.
03.	DN 1200 DI Coupling	01 Nos.
04.	DN 1200 DI Double Flanged 45° Bend	02 Nos.
05.	DN 1200 DI Double Flange Pipe (3.0m Length)	01 Nos.
06.	DN 1200 DI Double Flanged 90° Bend	02 Nos.



SEATING DETAILS FOR 1200Ø DI PIPE

WABAG

VA TECH WABAG
WABAG HOUSE
THORAIPAKKAM MAIN ROAD
CHENNAI

DWG. NO.	SHEET	REV
10P155-P0002-131	8 OF 9	R2

REFERENCE DRAWING

SL. No.	DRAWING TITLE	DRAWING No.
1	TOPOGRAPHICAL SURVEY DRAWING FOR RISING MAIN ROUTING - KANKARBAGH SPS B	10P155-C0001-108

NOTES :

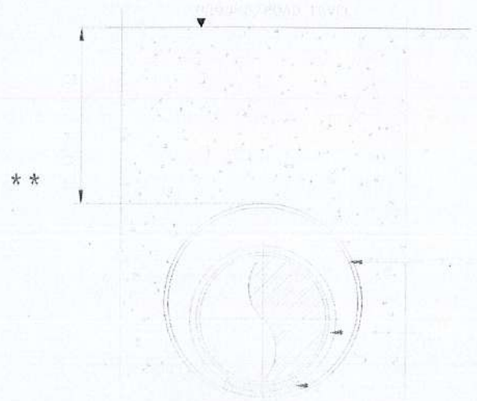
1. ALL DIMENSIONS AND LEVELS ARE IN MM.
2. REFER THE CIVIL DRAWINGS FOR STRUCTURAL DETAIL.

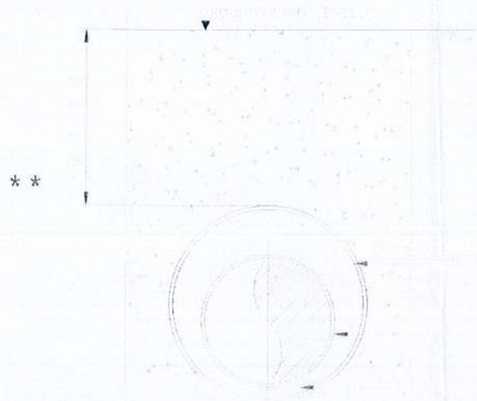
SCHEDULE OF PIPES AND FITTINGS

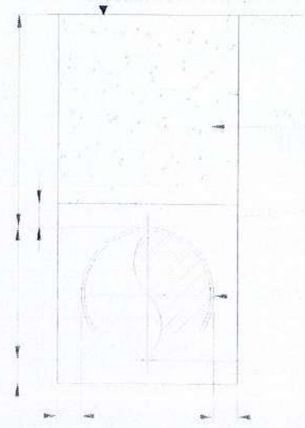
ITEM NO.	DESCRIPTION	QUANTITY
01.	DN 1200 DI Flange P/E Pipe (1.5m Length)	02 Nos.
02.	DN 1200 DI Double Flange Pipe (5.0m Length)	03 Nos.
03.	DN 1200 DI Coupling	01 Nos.

WABAG

10P155-P0002-131 | SHEET 9 OF 9 | REV R2







NOTES:

[illegible]

[illegible]	[illegible]	[illegible]
200–400	800	12
500–800	1200	14
900–1000	1600	16
1100–1200	1800	16

DEVELOPMENT AND OPERATIONS OF SEWAGE TREATMENT PLANTS AND SEWERAGE NETWORK AT PATNA - DIGHA

NATIONAL MISSION FOR CLEAN GANGA

BIHAR URBAN INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED

MAHINDRA CONSULTING ENGINEERS LIMITED

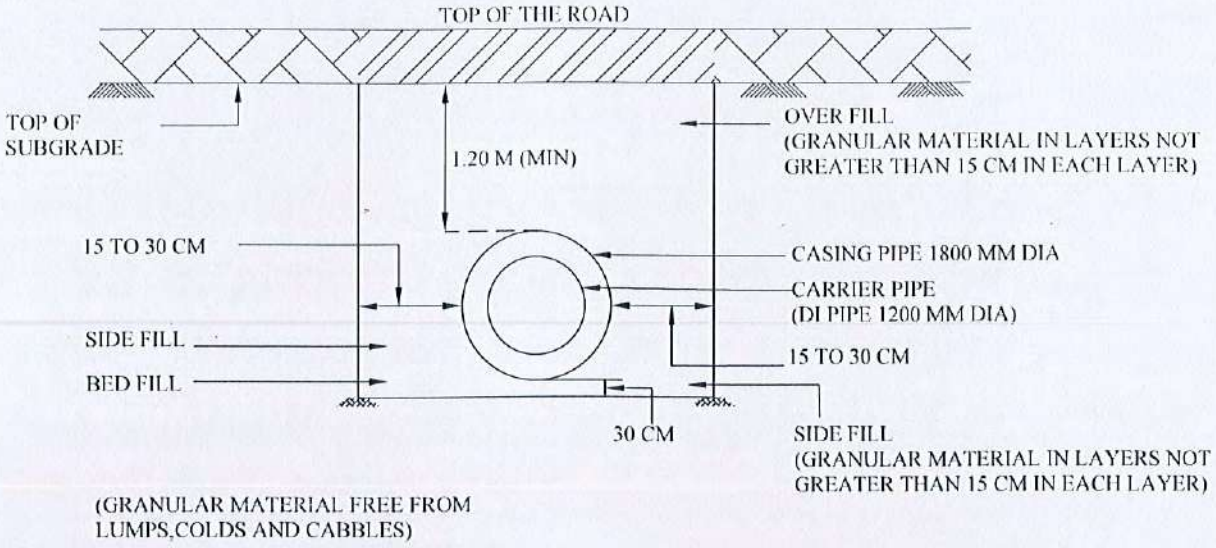
PRIVATE LIMITED

WABAG

VA TECH WABAG
WABAG HOUSE
THORAIPAKKAM MAIN ROAD,
CHENNAI-600117

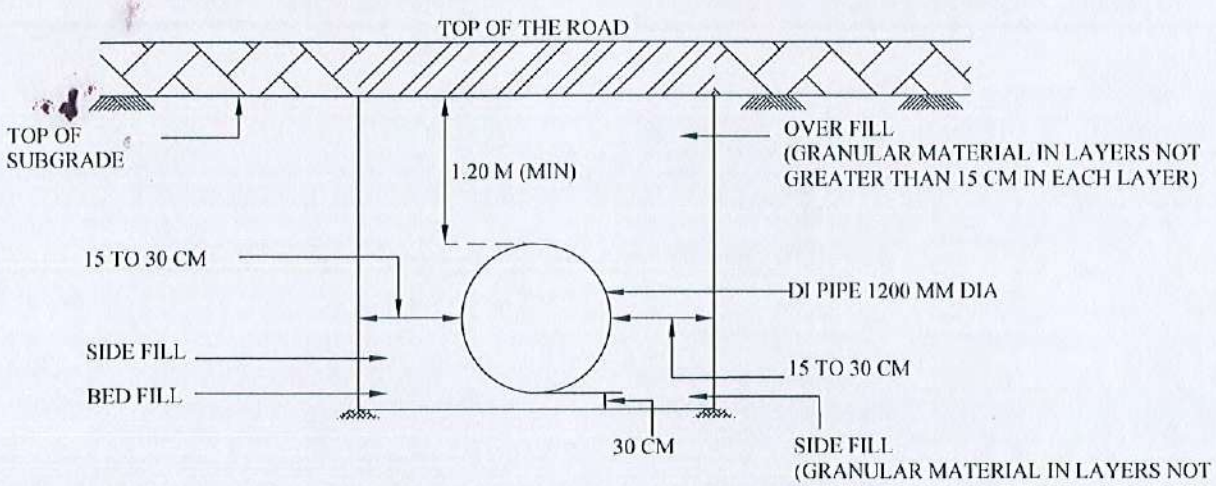
SCALE		SHEET	REV
NTS	10P155-X0004-101	01 OF 01	R0

DETAILS OF HIGHWAY CROSSING

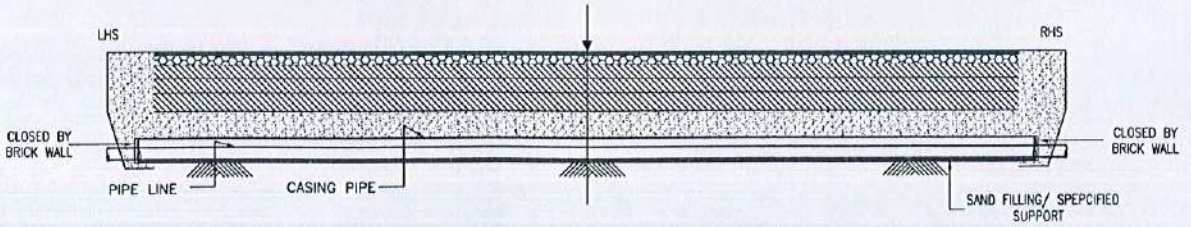


(GRANULAR MATERIAL FREE FROM LUMPS,COLDS AND CABBLES)

DETAILS OF PIPE LINE LAYING AT SERVICE ROAD



(GRANULAR MATERIAL FREE FROM LUMPS,COLDS AND CABBLES)



L-SECTION OF ROAD CROSSING

ARTELIA

Passion & Solutions

ACE: P1012: 17177
October 18, 2023

The Executive Engineer
Digha & Kankarbagh Sewerage Project,
Buidco, Room no. 205 Rajapur Pul,
West Boring Canal Road
Patna, Bihar

Sir,

Sub: Development of Sewage Treatment Plants (STPs) & Sewerage networks for 15 years in Patna, State of Bihar – Recommended to approve the Revised methodology for trenchless piping by jack pushing method for Digha and Kankarbagh Sewerage Network. -reg.

Ref: 1. Concession Agreement dated 30.12.2019
2.WABAG/10P155N/260/23-24, dated-26-09-2023.
3.WABAG/10P155N/264/23-24, dated-27-09-2023.

With reference to the above subject, it is recommended to approve the Revised methodology for trenchless piping by jack pushing method.

This is for your perusal & further necessary action, please.

Thank you.

for Artelia Consulting Engineers Limited
(Formerly Mahindra Consulting Engineers Ltd.)

Artelia Consulting Engineers Limited CHENNAI 600 002

Mohammad Nafis Ahmed Khan
Team Leader

Encl: Report

CC: 1. The Executive Director – Project, NMCG
2. Mr. Rajat Kumar, NMCG
3. Dr. Parveen, NMCG
4. The Executive Director–Technical, NMCG
5. The Chief Engineer, BUIDCo

WABAG

Digha & Kankarbagh Network Sewerage Project

Methodology for Trenchless Piping by Jack Pushing Method

Reference From: - IndSTT (Indian Society for Trenchless Technology)

1.0 Purpose:

The Purpose of this procedure is to lay guidelines, requirement and to establish a method or a system to control the open cutting & trenchless activity.

2.0 Scope:

The Scope of the works covers the laying of RCC Pipe NP4 of 1000mm, 1100mm, 1200mm, 1400mm & 1600mm dia on Digha & Kankarbagh Zone by using Trenchless Jack Pushing method.

3.0 Methodology:

3.1 Survey

Alignment of Pipe Line to be marked from the position of Manhole to Manhole which is to be constructed. Also enclosed Geo-Tech report along with this methodology showing the N Value of Soil Strata.

3.2 List of Manpower:

- Supervision Engineer -1
- Quality Engineer - 1
- Safety Officer -1
- Supervisor -1
- Excavator Operator -1
- Hydra Operator -1
- Welder -1 (for Strutting and shoring)
- Fitter -1 (for Strutting and shoring)
- Electrician -1
- Mechanic -1

- Rigger -As per Requirement
- Unskilled Labour - As per Requirement

3.2 List of Machinery:

- JCB / Excavator Machine - 1
- Tracker Machine -1
- DG Set -1
- Hydraulic Power Pack Machine for Jack Pushing -1
- Hydra -1
- Dewatering Pump 10HP -2
- Exhaust Fan -1
- Lighting Arrangement inside Pipe - As per Requirement

3.3 Procedure:

1. Underground Utilities to be checked with tracking machine before start of the work. If any Underground facility found, then it is to be informed to concern authority and change in alignment to be initiated and approved by the competent authority.

2. After checking with Tracking Machine and if there are no underground utilities or alignment approved, the marking of Manhole to be done on both ends and marking to be done on the ground for the underground piping.

3. Area to be properly barricaded with the steel barricading/ proper barricading and if diversion is to be made then the board of Diversion to be installed at both ends.

3. Entry Pit is to be excavated to the sufficient capacity so that RCC Pipe line of 2.5-meter length can be laid through this entry point by jack pushing method.

4. After Pit excavation the proper Strutting and Shoring to be done with Steel material

5. Inside the excavated pit, the RCC wall to be constructed on opposite direction of pipe pushing for support of jack resting.

6. Pushing of RCC Pipe to be started after that with Hydraulic Power Pack Machine from 100mm to 250mm and manually excavation of soil in pushing alignment with crow bar and pixels and disposal of soil outside of pit by the use of Hydra machine.

7. Activity of Pushing and Manual excavation inside of pipe to be done in tandem.

8. Arrangement of proper lighting and exhaust to be done for proper working inside of pipe line

8. Alignment & Level of pipe to be checked with Tracker Machine.

9. With the pushing and manual excavation method the pipe line to be laid up to the next manhole.

10. Then the RCC Wall made inside of the entry pit to be demolished.

11. Construction of Manhole as per the procedure to be done in the excavated entry pit.

12. Backfilling & road restoration will be done by other agency (RCD) and respective qty for the same has also been deposed from Wabag Contract.

13. By this way the work will go on from the entry point of next manhole.

14. Hydraulic testing of pipes as pes IS 3597 at every manhole to manhole.

4.1. ESHS Responsibilities: -

Site Engineers are frontline functionaries and they are accountable for safety and regulatory compliance in their function. Its includes

- Participating and implementation of site-specific HIRA/JSA.
- Responsible for the Implementation of OCPs.
- Providing daily 'Tool box Talk' and simulating high level of ESHS awareness at all times.
- Identification of high-risk work areas requiring permit to work system and ensuring the work only start after getting a work permit. **As per enclosed – A** Safety in confined spaces atmospheric hazards.
- Compliance to the applicable Acts, Rules, Regulation and Standards affecting occupational and safety.
- Contributing in implementing al ESHS requirements and ensuring that all works are performed in a manner, which is safe and without any risk to health & safety of staff & workmen.
- Participating in and adhere to all safety instruction, procedures and activities.

- Ensuring all the necessary controls are in place before start the work.
- Ensuring all the workers wear PPE as per job requirement.
- Providing advice and assistance on ESHS to all employee and subcontractors.
- Ensuring good housekeeping and rectify all the unsafe conditions at work place.
- Reporting & investigating all incidents and pay particular attention to those having caused injury to an employee.
- Supervising and ensuring compliance with safe work, procedures under permit system.
- Communicating with HSE engineer regarding the near miss, incident, and work related hazards of work being carried out.

4.2. ESHS Checklist: -

As a professional company we are assure that Sewerage Pipe Laying work by Manual Jack Pushing work carried out with below ESHS checklist

Checklist for Jack Pushing at Each Point		
S.No.	**Item Description**	**Availability as needed**
1	Engineer & Supervisor	All time at site
2	HSE Supervisor from Contractor	All time at every site
3	Labours required	Day 8nos and Night 8nos
4	Hydra loaded with ASLI	Day night alternative operator
5	Tractor	Day night alternative operator(with road permit)
6	Excavator	For Pit excavation & backfilling
7	Dewatering Pump	All time at site
8	Multi Gas detector	All time at site
9	Air Blower	All time at site
10	oxygen mask	All time at site
11	Ladder with Hand Rail	All time at site
12	DG set/Electric connection	All time at site
13	First aid kit	All time at site

Checklist for Jack Pushing at Each Point		
S.No.	Item Description	Availability as needed
14	Full safety Belt	All time at site
15	Life line rope with Full Body Harness (16mm)	All time at site
16	Shoring & shuttering as per required Depth	All time at site
17	Fire Extinguisher ABC type (5-Kg)	All time at site
18	SCBA - for oxygen	All time at site
19	Lifting belt - 10 ton	All time at site
20	Proper lighting arrangement	All time at site
21	Safety Helmet with light	All time at site
22	Mandatory PPE	All time at site
23	Job Specific PPE's	All time at site
24	Filter Cartridge Mask	All time at site
25	Traffic Marshall (Both Side)	All time at site
26	Safety Signage Board	All time at site
27	Road Safety Signage Board	All time at site
28	Industrial DB With ELCB/RCCB	All time at site
29	Legal Documents (JCB/Hydra)	All time at site
30	DL with Aadhaar Card	All time at site
31	Fitness certificate with Aadhaar ID	All time at site
32	TPI Certificate (Lifting Tools & Hydra)	All time at site
33	Blinker Light for night work	All time at site
34	24 Volt Light for Confined Space	All time at site
35	Flash Back Arrester (Both Side Hose Pipe)	All time at site
36	Oxygen & DA Cylinder With Trolley	All time at site
Note :-Total nos. of Hard Barricading Required as per Site.		

i). Enclosed B – CONFINED SPACES PERMIT TO WORK
ii). Enclosed C – RISK ASSESMENT SHEET.

For VA TECH WABAG LIMITED

(Project Manager)

Shashi Mohan Singh

SAFETY IN CONFINED SPACE

Objective:

Work in confined spaces presents a high risk for the health and safety of persons.

This procedure defines the minimum essential safety requirements of the Concessionaire for the intervention in a confined space.

It applies to all Confined space work sites

CONFINED SPACE

Essential modification(s):

- Procedure prepared by the Safety Department MACE

Associated documents:

- Safety in confined spaces – Permit to work

Contents:

1. DEFINITION 2
2. MAIN RISKS RELATING TO INTERVENTION IN A CONFINED SPACE 2
3. PREVENTING INVOLUNTARY ACCESS 6
4. INTERVENTION IN CONFINED SPACES 6
5. PROTECTIVE MEASURES 11
6. MONITORING AND ASSISTANCE TO ACCIDENT VICTIMS 14
7. ADDITIONAL INSTRUCTIONS ..... **ERROR! BOOKMARK NOT DEFINED.**

Definition

A confined space is a space that is completely or partially enclosed:

1. Which is not designed to be occupied by people, nor intended to do so, but which, when the need arises, may be occupied for the execution of work such as inspection, Trenchless Jack Pushing work, D-silting, maintenance or repair of pipeline, etc.

2. Which has limited means for entrance and exit. This could be a ladder or very long or very narrow stairs with a very steep slope. Any object or equipment may restrict access to the space or prevent air from circulating freely

3. Which may present risks for the safety of those who enter it, because of:
   - Its design, its construction or its location
   - Its atmosphere or insufficient natural or mechanical ventilation
   - Solids, liquids, gases and/or powdered material or substances that it contains or that can enter into it at any time
   - Other related dangers.

This is usually a location whose volume/opening dimension ratio is such that natural exchanges of the air inside with the outside atmosphere are non-existent, insufficient or uncontrollable.

The restriction in the movement of air may be due to:

- Either the narrowness of the location in relation to its length or depth.
- Or the closed nature of the place. Entrance is then from one or more openings, which may be of very small dimensions (manhole, for example), which increases the difficulties of access (enclosed confined space).

Examples of confined spaces: ditches, tanks, bins, chemical reactors, sewer manholes, narrow and long sewer pipeline or any other pipe line, channels, underground maintenance spaces, etc.

Main risks relating to intervention in a confined space

Confined spaces present environments that are particularly dangerous for the life and safety of workers. These risks are greatly increased by difficulties in evacuation and the risk of panic.

The majority of accidents are caused by an atmosphere with insufficient oxygen or a toxic environment (65% of deaths). Half the deaths are of those who attempt to rescue others (chain accidents).

Risks relating to the atmosphere

Asphyxia due to oxygen deficiency or an excess of other gases (CO_2, CO, CH_4, etc.)

Under-oxygenation of the air results from various causes:

- The consumption of oxygen by a combustion reaction (welding, fire, etc.), oxidation of a metal as well as breathing by the workers.
- Replacement of the oxygen by other gases during blow-down, seepage or inerting operations.

The air normally contains 21% of oxygen. Under-oxygenation represents a genuine danger to the life of a worker.

- At 16%: breathing difficulties, reduction in the judgement capacity, rapid exhaustion.
- At 12%: loss of consciousness and death in the absence of adequate response.
- At 6%: death in a few seconds.

Intoxication by inhalation or absorption of a gas or toxic product (H_2S, CO, etc.)

The accumulation of toxic substances is the source of serious intoxications, which can be fatal in the absence of adequate intervention.
Contamination of the air may result from the process, residual material (e.g. sewage residue, silt), work done (welding, cutting, grinding etc.), from outside the confined space (exhaust gases, etc.) or from chemical reactions between various products.
The most frequently encountered gases in sewer manholes, lines are hydrogen sulphide (H_2S), methane (CH_4), carbon monoxide (CO), carbon dioxide (CO_2)
The following tables list the general characteristics of the main dangerous gases as well as the most commonly accepted permissible exposure values.

Gas or vapour	Flammable	Physical description	Main risk	Permissible exposure value in air	Density (compared with air=1)
Chlorine (Cl_2)	No	Yellowish green colour; sharp odour	Toxic; severe irritant, pungent for the eyes and the respiratory tract	0.5 ppm	2.5
Carbon dioxide (CO_2)	No	Colourless, odourless	Displaces oxygen: toxic	5000 ppm	1.5

Gas or vapour	Flammable	Physical description	Main risk	Permissible exposure value in air	Density (compared with air=1)
Nitrogen dioxide (NO_2)	No	Reddish brown colour; sharp odour	Toxic; severe irritant for the respiratory tract	3 ppm	1.6
Sulphur dioxide (SO_2)	No	Colourless, suffocating odour	Toxic; severe irritant for the respiratory tract	2 ppm	2.2
Methane (CH_4)	Yes	Colourless, odourless	Fire and explosion	10 % of the L.E.L. Simple asphyxiant	0.6
Carbon monoxide (CO)	Yes	Colourless, odourless	Toxic; asphyxiant	35 ppm	0.97
Hydrogen sulphide (H_2S)	Yes	Colourless, rotten egg smell	Highly toxic; can cause pulmonary failure	10 ppm	1.2

H_2S: Colourless gas that smells like a rotten egg at low concentrations, odourless at high concentrations, heavier than air and irritates the eyes and the respiratory tract. Inhalation may cause pulmonary oedema and a delayed loss of consciousness. Limiting exposure value: 10 ppm.

Description	Concentration of H_2S (ppm)	Exposure time
Characteristics of hydrogen sulphide (H_2S)		
Mild odour (rotten egg smell)	5.0	-
Limiting exposure value	10	8 hours
Effects of exposure on humans		
Strong and unpleasant odour	25	-
Irritation of the eyes, coughing, loss of the sense of smell	100	2 to 5 minutes
Irritation of the trachea and strong irritation of the eyes	200 to 300	1 hour
Loss of consciousness and possible death	500 to 700	30 to 60 minutes
Rapid loss of consciousness, respiratory distress, death	700 to 1000	a few minutes

Description	Concentration of H_2S (ppm)	Exposure time
Almost immediate loss of consciousness, respiratory failure, death in a few minutes. Death may occur even when the victim is brought out in fresh air.	1000 to 2000	immediate

CH_4: Colourless gas, odourless and highly explosive.

CO: Colourless gas, odourless, flammable, lighter than air. A person over-exposed to this gas experiences humming, nausea, headache, drowsiness that may result in death, even at low concentrations. Chronic exposure may have undesirable effects on the nervous system and the cardiovascular system. Limiting exposure value: 35 ppm.

CO_2: Colourless, odourless gas, at high doses causes headache, vertigo, tachycardia with possible loss of consciousness. Limiting exposure value: 5000 ppm.

Explosions and fire due to the presence of flammable gases

Combustible gases, dusts and chemicals combined with poor ventilation may create explosive atmosphere. A spark due to any activity may then cause a fire or catastrophic explosions.

Physical risks

Electrocution

The risk of electrocution in a confined space during the use of electrical devices increases when:

- The confined space is so narrow that the worker is in contact with the walls of the space
- The confined space is a humid place, saturated with water vapour or containing water
- There are many metallic surfaces in the immediate environment (pipes, containers walls, etc.).

Work in a confined space with electrical devices such as hand tools increases the risk of electrocution caused by poor insulation of this equipment or a malfunction.

Other physical risks

There exist several physical risks that need to be considered when working in a confined space, such as:

- Fall or drowning that may be caused by the shape or contents of the confined space
- Difficult entrances and exits caused by the location or dimensions of the confined space
- Poor visibility due to lack of lighting or limited dimensions that can cause falls or sliding

- High or very low temperatures
- High noise, etc.

Preventing involuntary access

Many serious accidents result from disregarding dangers. Often, the victim is not aware of the risk he takes by entering a confined space.

In order to prevent any involuntary access to a confined space, the following measures are taken:

- Identify the confined spaces of the site and inform the personnel about them.
- Block access to the confined space by a adequate means (e.g. putting manhole cover, barricading along with open manhole, deputing security personnel etc.)
- Indicate the danger at the entrance to the confined space with the help of a permanent, fixed and perfectly visible sign.

Intervention in confined spaces

Preparing and organising the intervention

Inspection of a confined space requires a meticulous prevention procedure. Before any intervention, a detail **Work Method Statement shall be** prepared. It is aimed at providing a detail work methodology while analysing the consequences and possible risks of the intervention in the confined space.

- The description of work to be carried out. Only work provided for in the **Method Statement shall be** executed. If, during the intervention, other work is required or new risks are identified, another **Work Method Statement shall be** prepared.
- The selection of collective and personal means of protection, and particularly respiratory protection.
- The intervention strategy.
- Checking the availability of tools.
- The date, time and anticipated duration of the intervention.
- The names of workers, their qualification. Only authorised personnel are allowed to enter a confined space.
- The name of the supervisor and his qualification.
- Working instructions with preventive and protective measures:
  - The signalling and safety planning of the working area.
  - Atmosphere control (gas monitoring).
  - Confinement and blanketing of pipes.
  - Cleaning and blow-down
  - Ventilation.
  - Personal protective equipment.
  - Means of communication.
- The contingency plan and rescue measures.

Intervention authorisation in confined spaces

The authorisation to undertake work in confined spaces comes into effect after completion of:

1. The Work Method Statement
2. The work permits.

The intervention cannot begin if any one of the two documents is not signed.

The **Work Method Statement** shall be drawn up by the intervention manager. It is signed prior to the intervention by:

- The field engineer/ supervisor for implementing the intervention plan during execution of the activity.
- The **work permit** is to be prepared by the supervisor of the activity and approved by the field engineer.

The **work method statement** and the **work permit,** signed and originals, are available at all times at the work sites.

At any time, the intervention may be postponed or interrupted if the safety conditions are not or are no more respected.

Night interventions permission needs to be taken from client in advance.

The **work permits** need to file in PTW file at main office after completion of work.

Routine interventions

Periodic intervention in a confined space for a routine activity may lead to, due to habit, a relaxation in vigilance. A false sense of safety may then become prevalent among intervention teams. This procedure therefore applies without any exceptions.

Authorisation of personnel and training

Authorisation is the recognition by the employer of the ability of an employee to safely carry out activities presenting occupational hazards for him or for the environment at a given structure for a limited duration.

This authorisation is valid for a defined period not exceeding two years.

Personnel that need to intervene in a confined space have to be mandatorily authorised by their hierarchical superior. This authorisation consists in:

- Ensuring their physical and psychological ability by subjecting them to a prior health inspection. The health inspection needs to be planned on bi- annual basis.

- Training for risks relating to their activity, protective measures, the use of personal protective devices, operating procedures, safety precautions, rescue and first aid instructions.

This training is preferably given by an external agency. It includes at least the following points:

- Procedure
- Risks generated by the intervention
- Use of fall-arresting devices (safety harness, etc.)
- Use of life line
- Use of a multi gas detector.
- Use of a self-contained breathing apparatus
- Use of a emergency escape breathing apparatus.
- Rescue procedures and means.

Equipment

The personnel intervening in a confined space are mandatorily equipped with working and protective equipment. They use signalling equipment and means of communication that enable them to work in safety.

The **Work Method Statements shall** identify the list of equipment to be used during the intervention.

These equipment items are regularly checked.

The personnel are trained in their use.

Personal and collective protective equipment:

- Atmospheric controller (multi gas detector) shall carry by the person who is going first inside the confined space & leading the crew only after ensuring that all gases concentrations are within a permissible limit before entry.
- Blowers
- Fall-arresting device (safety harness for each entrants)
- Emergency escape breathing apparatus (20 minutes' duration) for each entrants.
- Adequate access / egress
- Life line must be attached to the individual safety harness at all times during their work. The only exception is if there is a danger of entanglement (i.e. more than three workers inside the pipe at the same time) in which case each worker may disconnect his safety rope at the bottom of the manhole (all ropes must remain at the bottom of the manhole) Safety harnesses are to be worn at all times while working in confined space.
- Safety Helmet, Gumboots/safety shoes, Hand gloves, working clothes, safety glasses
- ATEX proof 24 V electrical lamp

- Lifejacket when there is a possibility of drowning
- Non sparking tools
- First aid kit and equipment(Emergency vehicle)

NOTE: Precautions regarding use of portable electric light:

No portable electric light or any other electric appliance of voltage exceeding 24 volts shall be used inside any chamber, tank, sewer manhole, pipeline or other confined space.

- If any flammable gas, fume or dust is likely to be present in any chamber, tank, sewer manhole, pipeline or other confined space no lamp or light other than that of flame proof construction shall be used therein.

Other protective equipment may be used depending on other risks identified.

Signalling equipment

- Signalling cone markers
- Flash lights
- Manhole guard and shield.

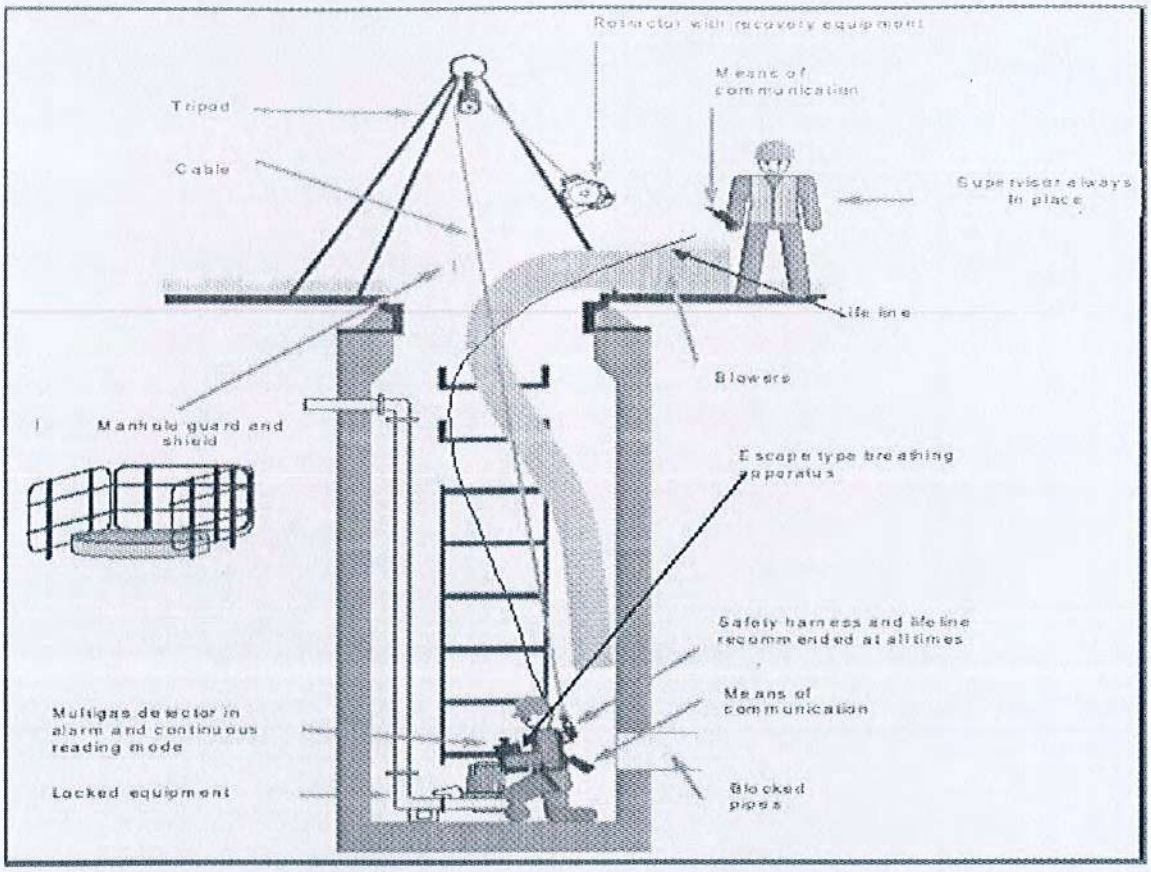
Means of communication

- Two-way radio, cellular telephone if there is no visual contact between the interveners and the supervisor.

It must be noted that the use of explosion-proof equipment is mandatory in ATEX zones and in confined spaces that may contain flammable substances (dust, CO, H_2S, CH_4, etc.). Therefore, cellular telephones are prohibited in ATEX zones.

These lists are not restrictive. The list of equipment depends on the nature of the intervention. This list needs to be made during the intervention preparation phase (**intervention plan**).

Filter canister masks are strictly prohibited.
Self-contained breathing apparatus is allowed only in rescue operation



Intervention

Several steps have to be mandatorily followed:

1. Obtaining the signed Work Method Statement and the **work permit**
2. Checking the authorisation personnel availability.
3. Making sure that every member of the intervening team is acquainted with and has understood the **Work Method Statement**.
4. Verifying the availability of equipment.
5. Ensuring the deployment of experienced & trained supervisor.
6. Providing assistance and first aid.
7. Setting up signalling (marking) and determining the safety perimeter of the working area.
8. Checking the confinement and blanketing of pipes necessary for securing the working area.
9. Checking the required personal protective equipment.
10. Ventilating the confined space and maintaining it till the last intervener has left the area.
11. Checking the gas risk in the confined space. Monitoring the atmosphere inside the confined space.

The work permit is used and filled-in by the supervisor during the entire duration of the intervention. The following elements are written down:

- Checks to be carried out
- Analyses of the atmosphere in the confined space
- Information on the ventilation system
- Emergency procedures
- Various comments
- The timing of major events.

It is signed by the intervention manager, the supervisor and all the interveners at the end of the operations

Once all the work is complete, the intervention ends only after all interveners and equipment have been evacuated from the confined space.

Protective measures

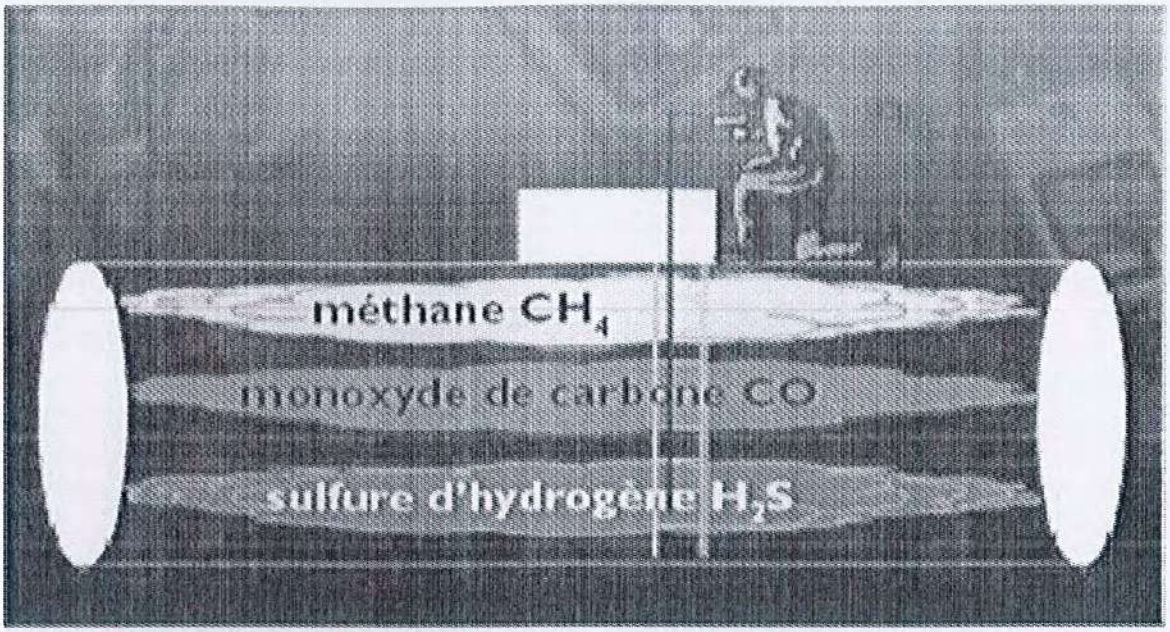
Monitoring the atmosphere requires detection of gases and ventilation of the confined space.

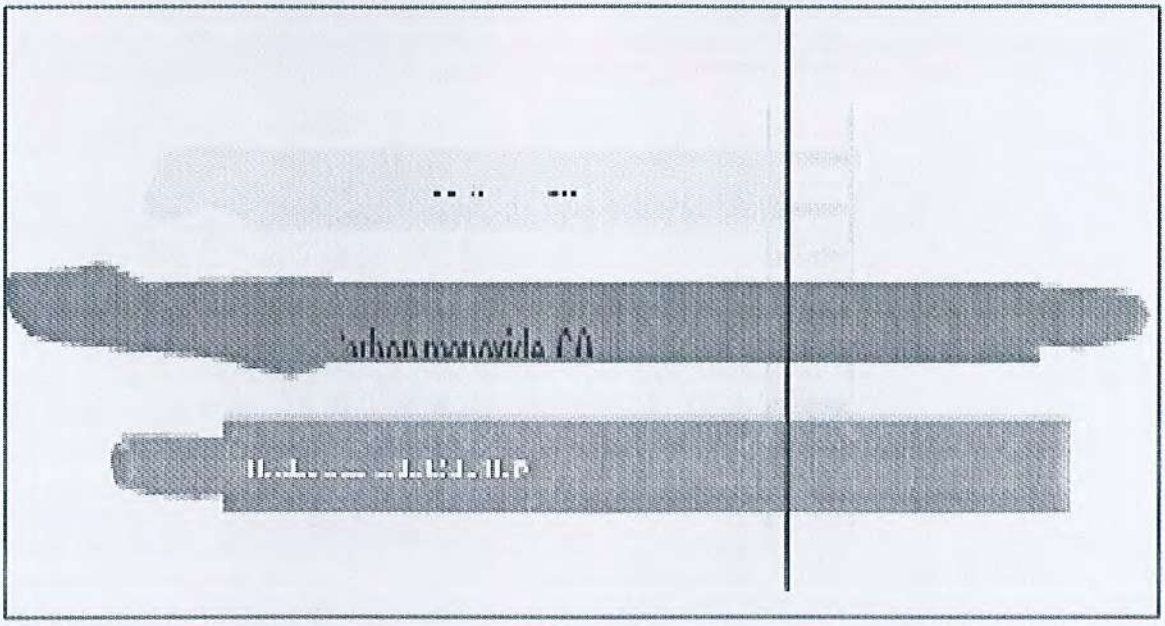
Gas detection

Gas detection is a critical phase for the safety of interveners. Three types of checks are done:

1. Explosion hazard
2. Toxic hazard.
3. concentration of oxygen

Assessment of the atmosphere is done by a qualified person, trained in the use of measurement devices and the interpretation of results.
Direct reading instruments are strongly recommended. They are intrinsic to safety when they are used inside the confined space.
The audible warning device must be heard even in a noisy environment. A vibrating device and indicator lamp in addition to the audible warning device are preferable.
Gas detectors are maintained, calibrated and checked regularly in accordance with the manufacturer's instructions.
Before every entry into a confined space, measurements are made with a device equipped with a sensor and an electric or manual pump, to take remote measurements, if required.
Depending on their density, gases may be found at different levels in the confined space. Methane, lighter than air, is concentrated in the upper portion, whereas hydrogen sulphide and carbon monoxide, which are heavier than air, may be found at the bottom instead. It is therefore necessary to make sure that the sensor is lowered at different levels to cover all the area.





The values to be measured are defined in the Work Permit. The following measurements are always mandatory:

- The oxygen concentration
- The explosive limit of gases and flammable or combustible vapours
- Concentration of toxic substances that may be found in the confined space.

These measurements are recorded on the work permit, and they are compared with the acceptable limiting values.
Once inside, the device is in streaming mode. It then provides the concentration of gases and oxygen in its immediate environment. Note, different concentrations may be found nearby. Exceeding the threshold triggers an immediate evacuation.

Cleaning and blow-down

Cleaning and blow-down are preparatory operations prior to entry into the confined space. As far as possible, cleaning and discharge of residues are done from outside, without entering the confined space.
It is prohibited to stick one's head into an opening of the confined space in order to take a look inside.
Water draining helps replace a dangerous atmosphere.

Ventilation

Ventilation increases the level of safety, dilutes the contaminants that may be present and undetected. It brings in oxygen.
Only continuous mechanical ventilation helps control a dangerous atmosphere; natural ventilation cannot be relied upon as air movements are unpredictable.
Before entering into it, the confined space is ventilated. The ventilation is maintained up to the end of the intervention and the exit of the last intervener.
Dilution ventilation consists in changing the air of the confined space. A ventilation system that pushes in fresh air into the confined space is used. Air inlets are located opposite the air outlets and at a place that is furthest from these. The fresh air inlet is kept away from sources of contamination.

We recommend:

- 7 changes of the air volume before entering.
- 20 changes of the air volume per hour, during the intervention.

The mode of ventilation depends on the nature and physical properties of the hazardous atmosphere.

Respiratory protection

Entry into a confined space is strictly prohibited if the conditions are abnormal even after draining, cleaning, blow-down and ventilation of the space.
As a result, permanent respiratory protection is normally not required.
However, every intervener takes along with him an emergency escape breathing apparatus while entering into confined spaces.
The emergency escape breathing apparatus is a respiratory protection with an internal provision for breathable air with a limited operation duration of about 15 to 20 minutes generally, enough for

leaving the enclosure in case toxic or flammable gases are detected, or in case of oxygen deficiency. It completely isolates the person wearing it from the atmosphere around.

The emergency escape breathing apparatus is not designed for normal work but is meant only for evacuation.

Its periodic verification is essential in order to ensure protection in case of need.
It must be recalled that:

- Filter canister masks are strictly prohibited. They do not provide protection against strong concentration of toxic gases and in case of oxygen deficiency
- Self-contained breathing apparatus is allowed for special operations (rescue & diving) that require wearing of this special respiratory protection.

Confinement and blanketing of pipes

Before the intervention, all energy sources like electrical, mechanical, hydraulic, chemical (sewage flow), thermal, pneumatic, etc., is isolated.
Confinement helps securely freeze a situation so that no modification is possible without the voluntary action of all interveners. In this regard confinement procedure preferred.
The blanking of pipes helps protect the interveners against a sudden inlet of hazardous substances. The pipes are disconnected, plugged or blocked.

Monitoring and assistance to accident victims

When a person is exposed to an oxygen deficiency or a toxic atmosphere, we have only a few minutes to respond before the consequences for the victim become irreversible or fatal.

It is therefore crucial to ascertain the difficulties as soon as they occur.

Continuous monitoring of the intervention is therefore mandatory.

The following are the supervision tasks:

- Observe those who enter the confined space
- Call in the rescuers as soon as the entrants have difficulties (when they require external assistance)
- Observe the working conditions inside the confined space
- Observe the external conditions that could influence the working conditions inside the confined space
- Supervise the proper operation of the ventilation
- Call the entrants so that they may leave the confined space when anomalies that could lead to a hazardous working environment are observed or when the working environment becomes hazardous.
- Supervise access so that unauthorised persons may not enter the confined space

- Check if the entrants are wearing suitable personal protective equipment.

Supervision is done by a specially designated person. This supervisor does not undertake any other task that could affect the supervision. He is suitably trained to execute his task.

The supervisor remains outside. He is in constant contact with the entrants. Direct visual contact is accorded priority. In case this is not possible, other suitable means may be used (radio equipment, or one person should stand at the bottom of manhole and others can go inside the pipeline so that he can act as a communicator between attendant and entrant for example).

He has means to call in the rescuers immediately from the place of supervision.
If the conditions necessary for safe work cannot be respected any more, the personnel must evacuate the confined space. This may be because of:

- A malfunction of the ventilation
- Measurement of a concentration beyond the permissible level etc

Panic and ignorance of the instructions and procedures to be followed are factors that aggravate an emergency situation.

An **emergency plan** for the specific risk of work in confined spaces is prepared as a preventive measure for each site. Its purpose is to give the personnel instructions to be followed in case of an accident or an alarm.

The **emergency plan** defines the instructions and emergency measures adapted to the sudden occurrence of a serious accident or an emergency. It specifies, in particular:

- Internal rescue measures
- First aid and medical assistance to be provided to victims
- Immediate measures to:
  - Control, combat and/or contain the dangerous situation
  - Avoid aggravating the situation
  - Protect the personnel, neighbouring populations and the environment
  - Safeguard the facilities and assets
- Evacuation of victims.

The intervention manager and the supervisor must acquaint themselves with the **emergency plan** before the start of the intervention.

1.Permit Space To Be Entered	M.H#/Location	SEC#	JOB#
2. Purpose of Entry			
3. Date of Entry	Authorized Duration of Entry		

4. Authorized Entrants	Name	Entry Time	Exit Time	Name	Entry Time	Exit Time

5. Attendant (s).....
.....
.....

6. A. Name of Supervisor/ Engineer of Issuing Authority .....

Name.....Sign.....Time.....

B. Name of Supervisor / Engineer of Performing Authority.

Name.....Sign.....Time .....

7. Record hazards and potential hazards of the permit space to be entered.				8. Check off list the measures used to isolate the permit space and to eliminate or control permit space hazards before entry.
Hazard	**Yes**	**No**	**N/A**	**†A. Purge-Flush and Vent**
A. Lack of Oxygen				
B. Combustible Gases				†B. Ventilation
C. Combustible Vapors				† Continuous?
D. Combustible Dusts				†C. Lockout/Tag out
E. Toxic Gases				
F. Toxic Vapors				†D. Inserting
G. Chemical Contact				
H. Electrical Hazards				†E. Blanking, Blocking, Bleeding
I. Mechanical Exposure				
J. Temperature				†F. External Barricades
K. Collapse of excavated pit/trench				
L. Entrapment				†G. Confined Space Identification/Signs
M. Fall of material / machines				
N. Acid/Caustic May Be Present				†H. Air Monitoring
O. Others				† Continuous

CS 01.01 RISK ASSESSMENT SHEET

Identification of the confined space: **Location:**

1. Entrances and exits

Is the entrance mandatory? Alternatives:

At what frequency?

Depth: Volume: Number of divisions:

Number of entrances: Dimension of entrances:

Position of the main entrance:

Equipement required to access and evacuate:

Equipement required for rescue:

Fall-prevention devices required:

Signalling required:

Measures taken to prevent the entry of an unauthorised person:

Does the design of the confined space present specific risks? (sketch overleaf if required)

a) For the workers

b) For the rescuer

2. Isolation of equipment and plugging of pipes

Identification of the equipment	**Type of energy**	**Items to be isolated or plugged**
1)		
2)		
3)		

All energies (electrical, mechanical, hydraulic, chemical, thermal, pneumatic, etc, potential or residual) must be removed, isolated and/or dissipated so as not to endanger the safety of personnel.

3. Assessment of the atmosphere

Contents of the confined space:

Atmosphere: ☐ Flammable or combustible >= 10% ☐ Irritant ☐ Oxygen < 19%

☐ Toxic gas ☐ Dust ☐ Oxygen > 23%

Specific contaminant to be detected:

Must the confined space be emptied? Must it be cleaned? Must it be drained?

Other comments

General ventilation required

Natural ventilation flow: Flow of the required dilution ventilation:

Number, type, capacity and position of fans required:

4. Work to be carried out

☐ Hot working Welding and cutting permit require ☐ yes ☐ no

Chemicals used	**Equipment and tools used**
1)	1)
2)	2)
3)	3)

Local ventilation required

Flow of the exhaust ventilation required:

Number, type, capacity and position of fans required:

5. Other hazards

Mechanical hazards			**Biological hazards**		**Others**
☐ Fall	☐ Drowning		☐ Wastewater	☐ Sediments	
☐ Projections	☐ Noise		☐ Bioaerosols	☐ Dust	
☐ Free flowing material	☐ Equipment		☐ Mildew	☐ Rodents	

6. Protective equipment required

☐ Self-rescue gas mask	☐ Goggles	☐ Protective footwear	☐ Gas detector	
☐ Respiratory protection	☐ Gloves	☐ Safety boots	☐ Explosion-proof light	
☐ Safety harness	☐ Life line	☐ Fall-arresting device		
☐	☐	☐		
☐	☐	☐		

DO NOT DESTROY THIS PERMIT AFTER CANCELLATION / COMPLITATION THIS ENTRY PERMIT MUST BE RETAINED BY EMPLOYER FOR AT LEAST TWO YEAR

9. Test(s) To Be Taken	Permissible Entry Levels	Test 1	Test 2	Test 3	Test 4
A. Percent of Oxygen (O2)	19.5% to 23.5%				
B. Combustible Gas	10% LEL				
C. Hydrogen Sulphide (H2S)	10 PPM				
D. Carbon Monoxide	25 PPM				
Name of the initial tester					
Test Time (or Continuous)					

0. Rescue and Emergency services Available:
Address and Cross street
.....

.....Name.....
.....

.....Telephone.....
.....

1. Communication procedures to be used by authorized entrants and attendants.

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

12. Equipment supplied to the employee.

Yes	No	N/A	Equipment	Description
			(i) Gas test Name.....Model/Type..... Monitoring Ser. No.	
			Calibration days remaining	
			(ii) Ventilating Positive ⟊	Negative ⟊
			(iii) Communications	
			(iv) Personal Protective Equipment ⟊Safety Harness with Lifeline ⟊Respiratory	⟊Hard Hats ⟊Eye ⟊Ear ⟊Face ⟊Hand ⟊Foot ⟊Clothing
			(v) Lighting	

Yes	No	N/A	Equipment	Description
			(vi) Barriers/ Shields	†Pedestrian †Vehicle †Other
			(vii) Safe Ingress/Egress	†Ladders †Tripod
			(viii) Rescue and Emergency	†Lifelines †Hoist †Resuscitators Inhalators
			(ix) Other Safety Equipment	

13. Acceptable Entry Conditions	Yes		Supervisors Initials		
14. Other information for this particular confined space to ensure employee safety.					
15. Additional Permits Required. †Hot Work †Other					

THIS CONFINED SPACE ENTRY PERMIT HAS BEEN CANCELLED / COMPLETED BY

..../.....

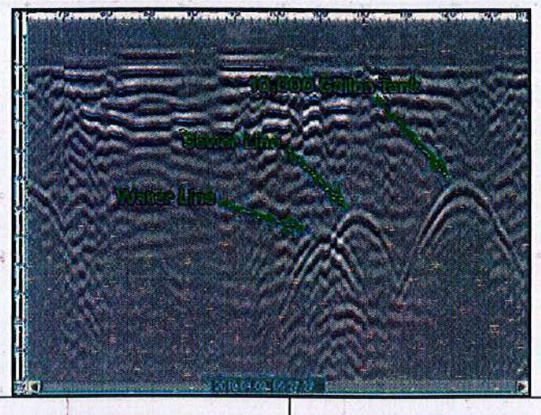
.....

Entry Permit Supervisor (Name & Sign) Time Date

Reason for Cancellation of Permit (If any).....

SUBSURFACE UTILITY ENGINEERING REPORT (SUE)

KEY MAP



CITY	PATNA
SURVEY DATE	20-Oct-2024
DRAWING SUBMISSION DATE	04-Nov-2024
ROUTE NAME / ROAD NAME	Patna Sitamarhi Road NH-22
ROUTE LENGTH IN METERS	103 mtrs

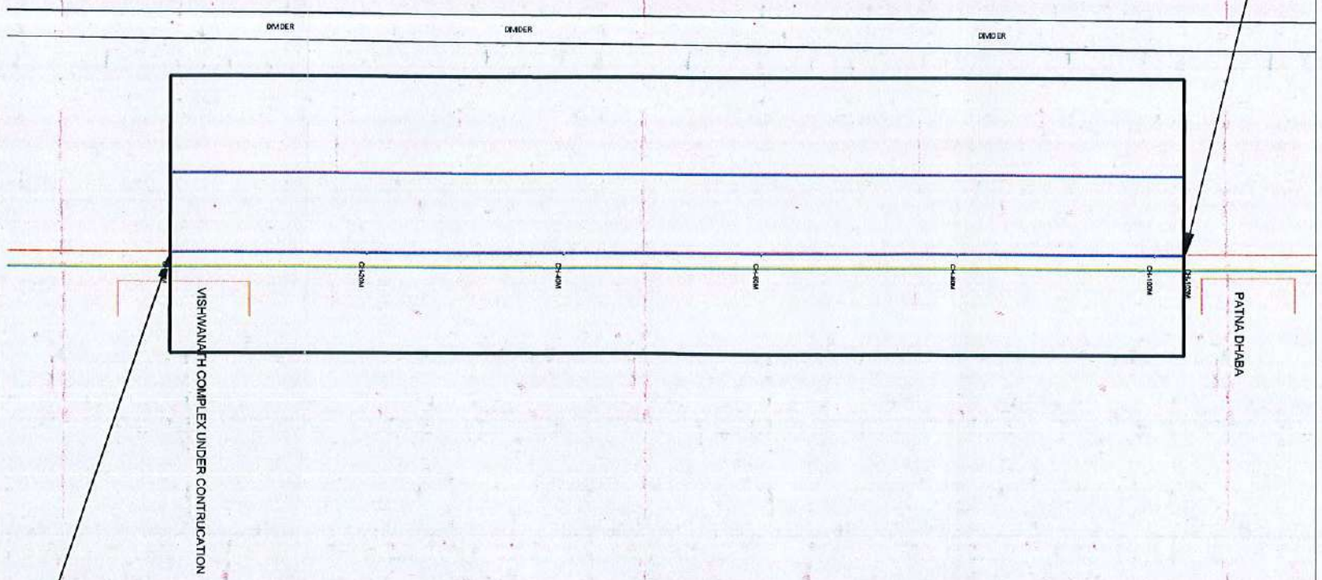
CONTRACTOR :-

C&G SURVEY TECHNICAL SERVICE

CLIENT :

VA TECH WABAG LIMITED

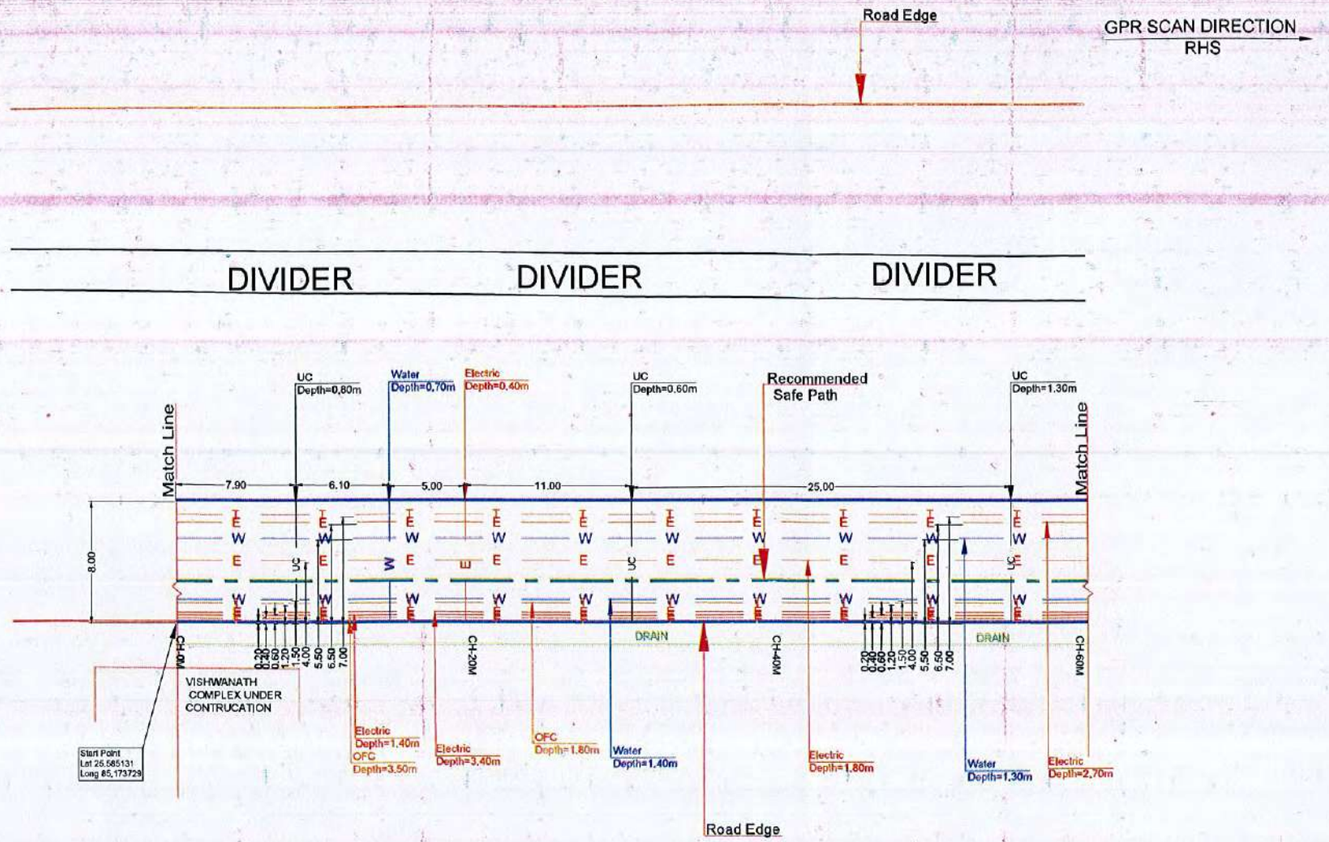
End Point
Ch-103M
Lat 25.585159
Long 85.174698



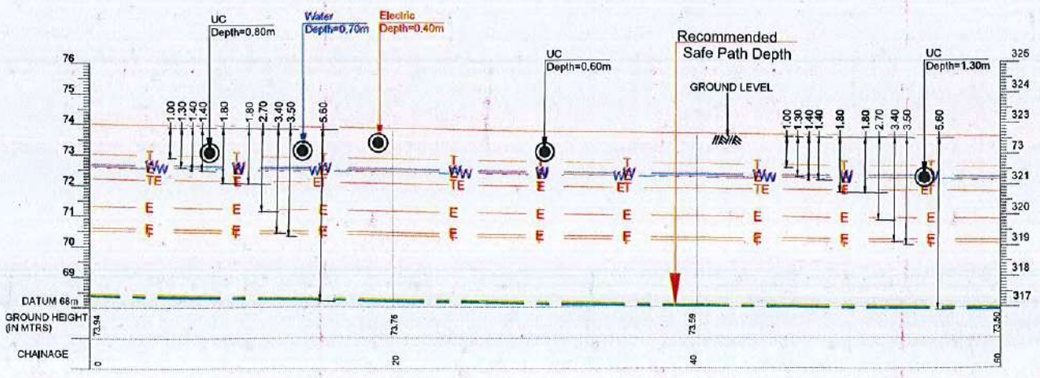
Start Point
Ch-0.00m
Lat 25.585131
Long 85.173729

(NEXT SHEET No.02)

PLAN

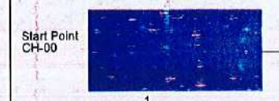


L-SECTION



*RECOMMENDED DEPTH FOR SAFE PATH IS 5.60m

KEY MAP



N

LEGEND AND SYMBOLS :-

W W	Utilities Water		Railway Crossing
S S	Utilities Sewer		Railway Station
E E	Utilities Electrical	Y	Fire Station
T T	Utilities Telecom	P	Police Station
GAS GAS	Utilities Gas		Airport
OIL OIL	Utilities Oil	H	Hospital
UC UC	Utilities Others		College / University
M M	Utilities Metallic		School
C C	Cable		Hotel
D D	Drain		Petrol Bunk
	Recommended Safe Path		Theatre
	Survey Corridor		Water Body
	Road Edge		Bus Stand
	Drain		Tree
	Kaccha		Row of Trees
	Footpath		Bush
	Divider	SB	Sign Board
	Bridge / Culvert		Well \ Bore
	Transformer		Gate
	Electrical Pole		Kilometer Stone
	Telephone Pole	MH	Manhole
	Traffic Signal Pole	W	Water Chamber
	Street Light Pole	G	Gas Chamber
TJ	Telecom Junction Box	S	Sewer Chamber
EJ	Electric Junction Box	O	Oil Chamber
	HT Tower	WV	Water Valve
	Telecom Tower (Others)	D	Drain Chamber
	Temple	CH	Chamber
	Church		Oil Marker
	Mosque		Gas Marker

NOTES :-

D : Depth to top of the utilities in meters from GL

Electric Pole & Light Pole Numbers are available on site.

DISCLAIMER :- The Findings Presented In This Report Are Based On The Sue Exercise Conducted By C&G According To Standards Set For Such Surveys, And By Experienced Personnel. However, Due To Inherent Limitations Of The Indirect Techniques, There Might Be Discrepancies, And Company Does Not Own The Responsibility For Any Damage To The Utilities, Equipment Or Manpower, Arising Out Of Such Discrepancies.

PLAN SCALE :-	H/V=1:200	SHEET SIZE :- A3	
L-SECTION SCALE :-	H=1:200 V=1:100	SECTION LENGTH :-	60 mtrs.

Route Name :- Patna Sitamarhi Road NH-22

LOCATION :- NH-22

SIDE OF THE ROAD :- RHS CITY PATNA

CONTRACTOR :-

C&G SURVEY TECHNICAL SERVICE

CLIENT :

VA TECH WABAG LIMITED

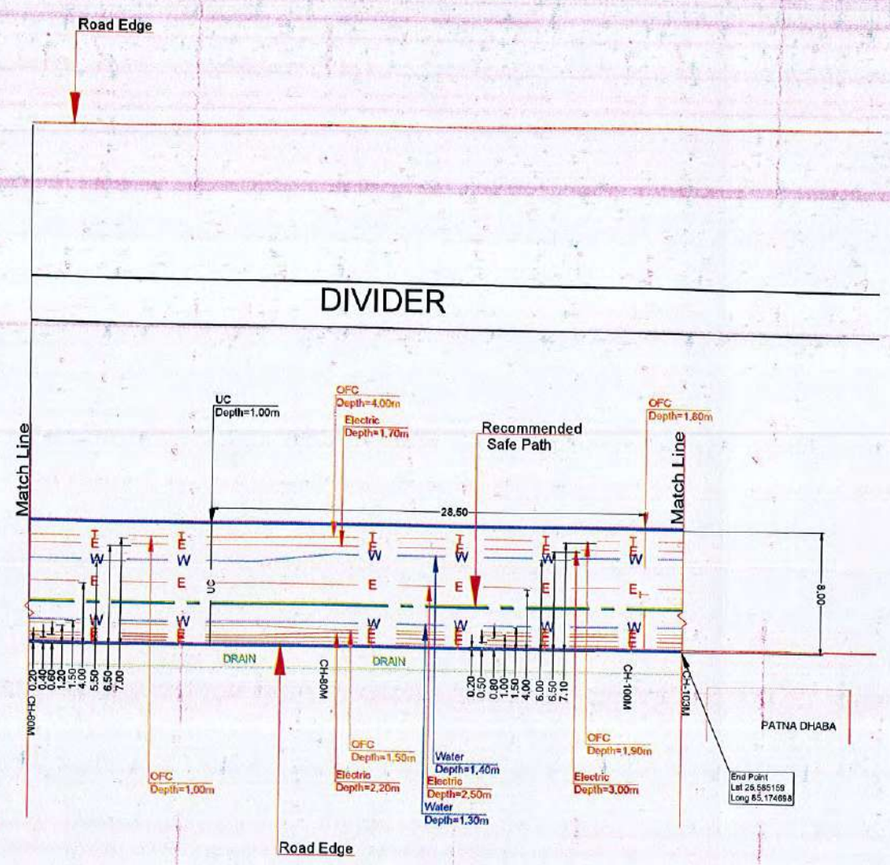
SURVEY DATE : 20-10-2024	SUBMISSION DATE : 04-11-2024		
DRAWN : Zubair	CHECKED BY : Shashi Kumar	APPROVED BY : Gunjan Kumar	

PROJECT TITLE :SUB SURFACE UTILITY ENGINEERING SURVEY

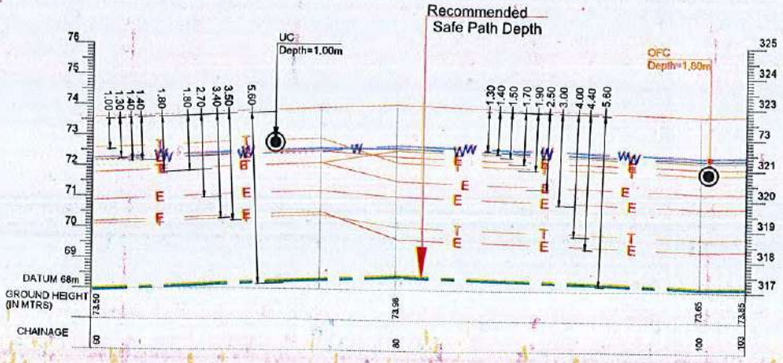
DRAWING TITLE : Route Name-Patna Sitamarhi Road NH-22
CHAINAGE : 00 TO 60M

PROJECT TYPE :-	DRAWING No.	REV.	SHEET NO.
GPR SURVEY		00	01 /02

PLAN

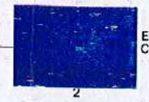


L-SECTION



*RECOMMENDED DEPTH FOR SAFE PATH IS 5.60m

KEY MAP



LEGEND AND SYMBOLS :-

Utilities Water	Railway Crossing
Utilities Sewer	Railway Station
Utilities Electrical	Fire Station
Utilities Telecom	Police Station
Utilities Gas	Airport
Utilities Oil	Hospital
Utilities Others	College / University
Utilities Metallic	School
Cable	Hotel
Drain	Petrol Bunk
Recommended Safe Path	Theatre
Survey Corridor	Water Body
Road Edge	Bus Stand
Drain	Tree
Kaccha	Row of Trees
Footpath	Bush
Divider	Sign Board
Bridge / Culvert	Well \ Bore
Transformer	Gate
Electrical Pole	Kilometer Stone
Telephone Pole	Manhole
Traffic Signal Pole	Water Chamber
Street Light Pole	Gas Chamber
Telecom Junction Box	Sewer Chamber
Electric Junction Box	Oil Chamber
HT Tower	Water Valve
Telecom Tower (Others)	Drain Chamber
Temple	Chamber
Church	Oil Marker
Mosque	Gas Marker

NOTES :-

D : Depth to top of the utilities in meters from GL

Electric Pole & Light Pole Numbers are available on site.

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PLAN SCALE :-	H/V=1:200	SHEET SIZE :- A3
L-SECTION SCALE :-	H=1:200 V=1:100	SECTION LENGTH :- 43 mtrs.

Route Name :- Patna Sitamarhi Road NH-22

LOCATION :- NH-22

SIDE OF THE ROAD :- RHS CITY PATNA

CONTRACTOR :-

C&G SURVEY TECHNICAL SERVICE

CLIENT :

VA TECH WABAG LIMITED

SURVEY DATE : 20-10-2024	SUBMISSION DATE : 04-11-2024
DRAWN : Zubair	CHECKED BY : Shashi Kumar APPROVED BY : Gunjan Kumar

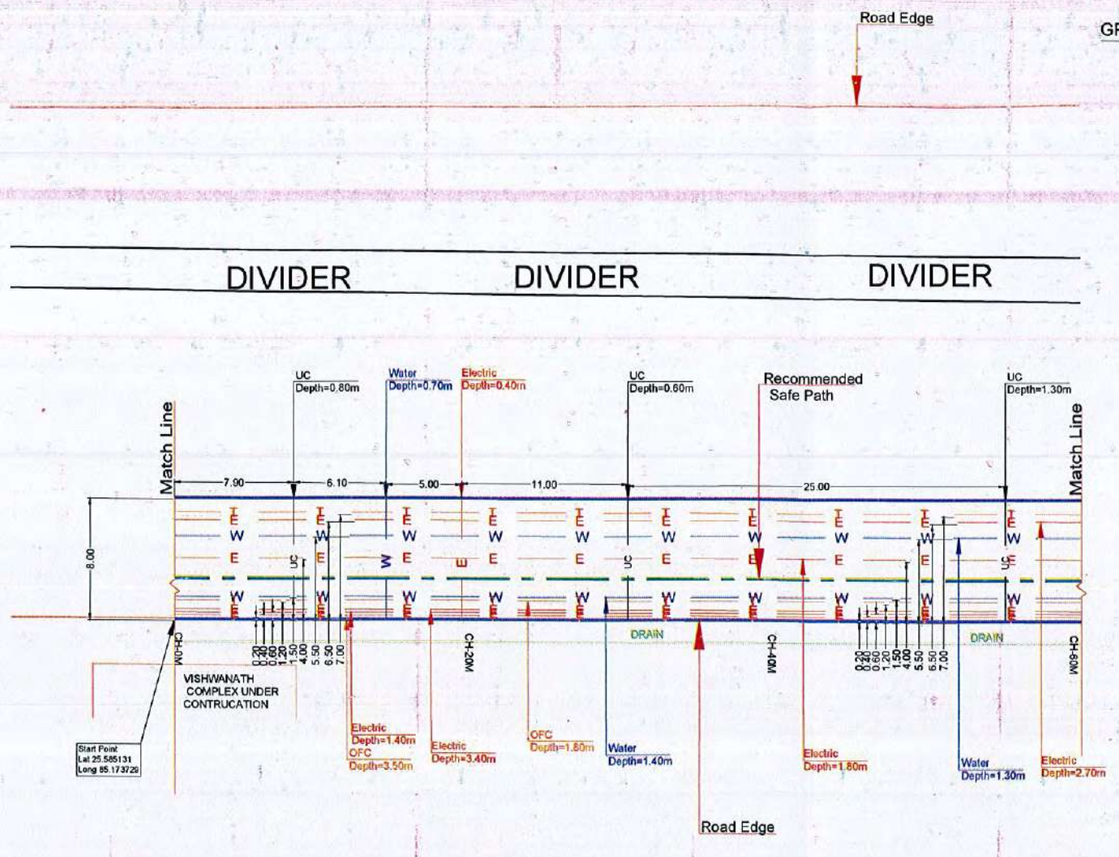
PROJECT TITLE :SUB SURFACE UTILITY ENGINEERING SURVEY

DRAWING TITLE : Route Name-Patna Sitamarhi Road NH-22 CHAINAGE : 60 TO 103M

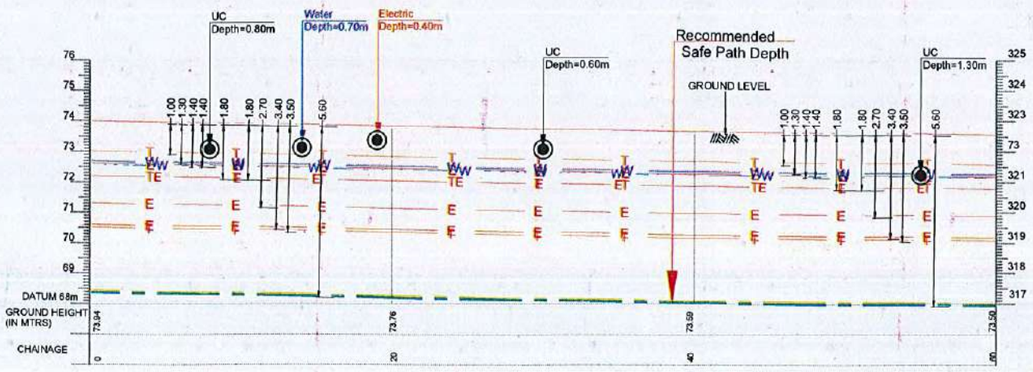
PROJECT TYPE :-	DRAWING No.	REV.	SHEET NO.
GPR SURVEY		00	02/02

(NEXT SHEET No.02)

PLAN

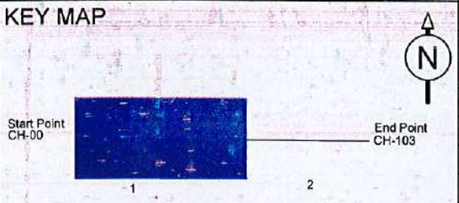


L-SECTION



*RECOMMENDED DEPTH FOR SAFE PATH IS 5.60m

KEY MAP



LEGEND AND SYMBOLS :-

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Utilities Sewer	Railway Station
Utilities Electrical	Fire Station
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Utilities Metallic	School
Cable	Hotel
Drain	Petrol Bunk
Recommended Safe Path	Theatre
Survey Corridor	Water Body
Road Edge	Bus Stand
Drain	Tree
Kaccha	Row of Trees
Footpath	Bush
Divider	Sign Board
Bridge / Culvert	Well \ Bore
Transformer	Gate
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Telephone Pole	Manhole
Traffic Signal Pole	Water Chamber
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Telecom Tower (Others)	Drain Chamber
Temple	Chamber
Church	Oil Marker
Mosque	Gas Marker

NOTES :-

D : Depth to top of the utilities in meters from GL

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PLAN SCALE :-	H/V=1:200	SHEET SIZE :- A3
L-SECTION SCALE :-	H=1:200 V=1:100	SECTION LENGTH :- 60 mtrs.

Route Name :- Patna Sitamarhi Road NH-22

LOCATION :- NH-22

SIDE OF THE ROAD :- RHS CITY PATNA

CONTRACTOR :-

C&G SURVEY TECHNICAL SERVICE

CLIENT :

VA TECH WABAG LIMITED

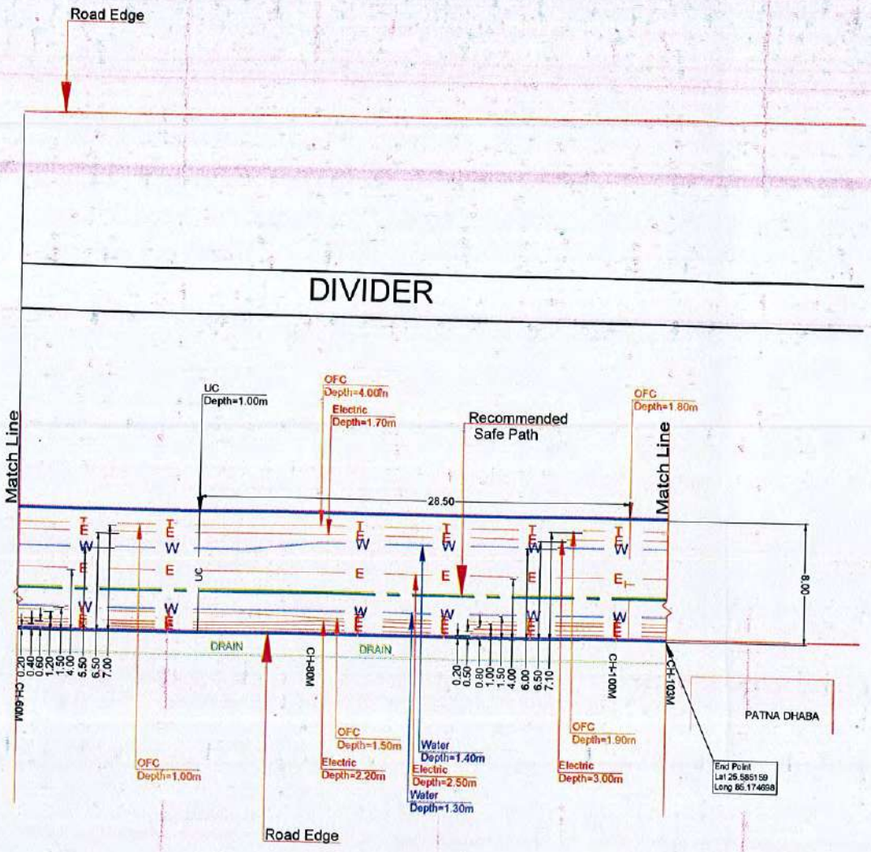
SURVEY DATE : 20-10-2024	SUBMISSION DATE : 04-11-2024
DRAWN : Zubair	CHECKED BY : Shashi Kumar APPROVED BY : Gunjan Kumar

PROJECT TITLE :SUB SURFACE UTILITY ENGINEERING SURVEY

DRAWING TITLE : Route Name-Patna Sitamarhi Road NH-22
CHAINAGE ; 00 TO 60M

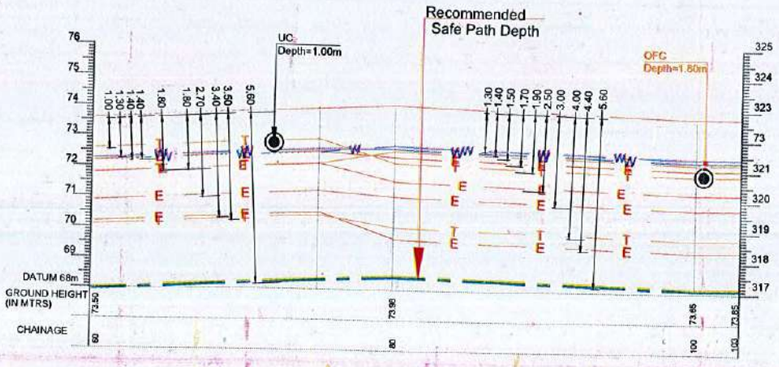
PROJECT TYPE :-	DRAWING No.	REV.	SHEET NO.
GPR SURVEY		00	01/02

PLAN



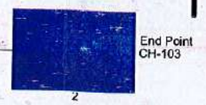
GPR SCAN DIRECTION
RHS

L-SECTION



*RECOMMENDED DEPTH FOR SAFE PATH IS 5.60m

KEY MAP



LEGEND AND SYMBOLS :-

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Drain	Petrol Bunk
Recommended Safe Path	Theatre
Survey Corridor	Water Body
Road Edge	Bus Stand
Drain	Tree
Kaccha	Row of Trees
Footpath	Bush
Divider	Sign Board
Bridge / Culvert	Well \ Bore
Transformer	Gate
Electrical Pole	Kilometer Stone
Telephone Pole	Manhole
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Telecom Tower (Others)	Drain Chamber
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NOTES :-

D : Depth to top of the utilities in meters from GL

Electric Pole & Light Pole Numbers are available on site.

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PLAN SCALE :-	H/V=1:200	SHEET SIZE :- A3
L-SECTION SCALE :-	H=1:200 V=1:100	SECTION LENGTH :- 43 mtrs.

Route Name :- Patna Sitamarhi Road NH-22

LOCATION :- NH-22

SIDE OF THE ROAD :- RHS CITY PATNA

CONTRACTOR :-

C&G SURVEY TECHNICAL SERVICE

CLIENT :

VA TECH WABAG LIMITED

SURVEY DATE : 20-10-2024	SUBMISSION DATE : 04-11-2024
DRAWN : Zubair	CHECKED BY : Shashi Kumar APPROVED BY : Gunjan Kumar

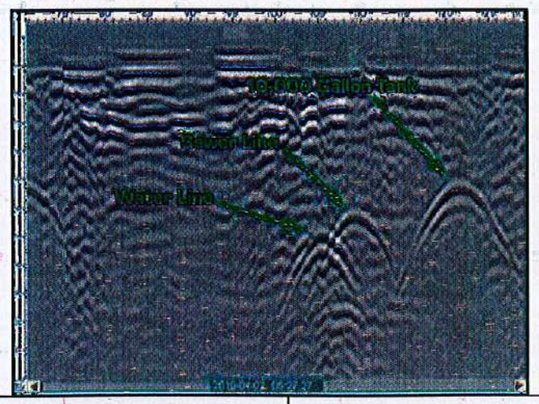
PROJECT TITLE :SUB SURFACE UTILITY ENGINEERING SURVEY

DRAWING TITLE : Route Name-Patna Sitamarhi Road NH-22
CHAINAGE : 60 TO 103M

PROJECT TYPE :-	DRAWING No.	REV.	SHEET NO.
GPR SURVEY		00	02/02

SUBSURFACE UTILITY ENGINEERING REPORT (SUE)

KEY MAP

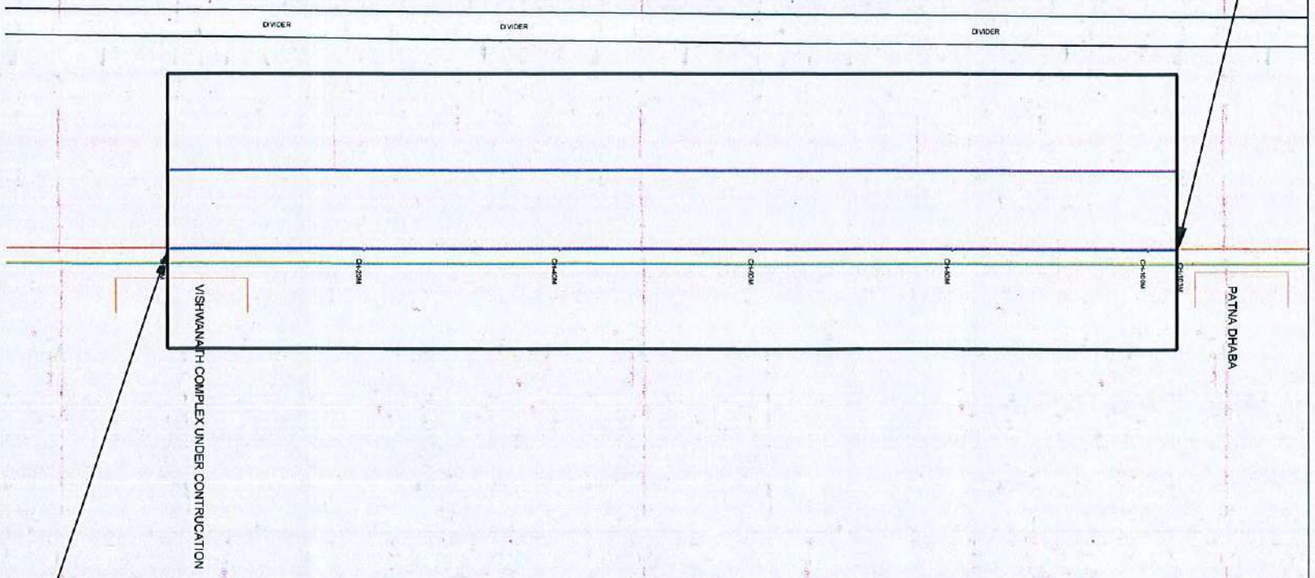


CITY	PATNA
SURVEY DATE	20-Oct-2024
DRAWING SUBMISSION DATE	04-Nov-2024
ROUTE NAME / ROAD NAME	Patna Sitamarhi Road NH-22
ROUTE LENGTH IN METERS	103 mtrs

CONTRACTOR :-
C&G SURVEY TECHNICAL SERVICE

CLIENT :
VA TECH WABAG LIMITED

End Point
Ch-103M
Lat 25.585159
Long 85.174698



Start Point
Ch-0.00m
Lat 25.585131
Long 85.173729