

Joint Committee Inspection Report

To be

Submitted in reference to the

Hon'ble National Green Tribunal

(CZ), Bhopal

Order dated 10.02.2026

In the matter of

Original Application No. 28/2026 (CZ)

Earlier listed as OA No. 13/2026 (PB)

Sanjay Kumbhare

VS

State of Madhya Pradesh & Ors

Members of the Committee: -

- 1. Sub-Divisional Magistrate, Tehsil Badnawar, District Dhar**
- 2. Regional Officer, Madhya Pradesh Pollution Control Board, Dhar**

Date of Inspection: - 11.03.2026

Joint Inspection Report
O.A. 28/2026 CZ)
Earlier listed as OA No. 13/2026 (PB)

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Date: 16.04.2026

Place: Bhopal

Submitted by MPPCB:-
through Counsel



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Email: parul.bhadoria04@gmail.com

Joint Committee Inspection Report
(NGT O.A. No. 28/2026) (CZ)

Hon'ble National Green Tribunal, (CZ), Bhopal had issued the following directions vide order dated 10.02.2026 in the O.A. No. 28/2026 (CZ) i.e. Sanjay Kumbhare VS State of Madhya Pradesh & Ors. Hon'ble National Green Tribunal, (CZ), Bhopal had constituted a committee comprising of following members: -

- (i) One representative from the collector, Dhar (M.P.)*
- (ii) One representative from the state pollution control board*

To visit the site and submit the factual and action taken report within six weeks. The background and relevant extract of the order dated 10.02.2026 are furnished below: -

- 1. Issue raised in this application is damage to the environment due to pollution of River Balwanti flowing in Nagar Parishad Badnawar in Dhar District in Madhya Pradesh, due to excessive encroachment, discharge of waste water from dirty drains, solid waste of city, untreated sewage is directly discharged into the river causing pollution in River Balwanti in Balika Badnawar area, Foul smell emitting and spreading in surrounding area causing serious health hazard to local residents.*
- 2. In view of the above facts we implead the following persons as a respondent –*
 - i. State of Madhya Pradesh through District Magistrate, Dhar, Madhya Pradesh.*
 - ii. Madhya Pradesh Pollution Control Board (MPPCB) through Member Secretary, Arera Colony, M. P. 462016.*
 - iii. CMO, Nagar Parishad Badnawar, Nayapura, Badnawar, District Dhar, Madhya Pradesh-454660.*
- 3. A substantial issue of environmental has been raised.*
- 4. Issue notice to the respondents. Returnable within four weeks.*
- 5. Registry is directed to take necessary steps for service to the respondents by both ways and also on available email.*
- 6. Respondents are directed to submit their reply within six weeks through e-filing portal, preferably in the form of searchable PDF/ OCR Support PDF and not in the form of Image PDF.*
- 7. In view of the seriousness of the matter we constitute a Joint Committee consisting the following members to visit the site and submit the action taken report.*
 - i One representative of the District Magistrate, Dhar, MP*
 - ii One representative of State Pollution Control Board.*
- 8. The Committee is directed to visit the place and submit the factual and action taken report within six weeks. The State PCB will be the nodal agency for coordination and logistic support.*

9. Registry is directed to supply the required documents and copy of the application to the committee and respondents within a week.
10. The report in the matter be filed by the Committee through email at ngtczbbho-mp@gov.in preferably in the form of searchable PDF/OCR Support PDF and not in the form of Image PDF.

In compliance with the directions issued by the Hon'ble NGT (CZ) in O.A. 28/2026 dated 10.02.2026, the HO, MPPCB, Bhopal OD-101, 17/02/2026 nominated as OIC of case. The Collector, Dhar nominated the SDM, Badnawar, District Dhar and CMO, Nagar Parishad, Badnawar as his representative through letter no. 1742 dated 06.03.2026. Inspection was conducted by the joint committee comprising of the SDM, Badnawar, District Dhar, CMO, Nagar Parishad, Badnawar and Regional Officer, MPPCB, Dhar on dated 11.03.2026.

The committee comprising of the following nominated members was constituted: -

S.No.	Name of Department	Name of Committee Members
1.	Representative from the Collector, Dhar (M.P.)	1. Mrs. Priyanka Mimrot, Sub Divisional Magistrate (SDM) Badnawar, Dhar (M.P.) 2. Shri Lalsingh Rathre, Chief Municipal Officer (CMO), Nagar Parishad, Badnawar, Dhar
2.	Representative from M.P.P.C.B., Regional Office Dhar	Shri Ajay Kumar Mishra Regional Officer, M.P.P.C.B.

Copy of nomination orders received from Collector Dhar are enclosed as **Annexure-1**

Details of the officials present during the site visit on dated 11.03.2026 as follows: -

- i. Mrs. Priyanka Mimrot, Sub Divisional Magistrate (SDM) Badnawar, Dhar (M.P.)
- ii. Shri Ajay Kumar Mishra, Regional Officer, MPPCB Regional Office, Dhar (M.P.)
- iii. Shri Ashok Ramawat, Scientist, MPPCB Regional Office, Dhar (M.P.)
- iv. Shri Lalsingh Rathore, Chief Municipal Officer (CMO), Nagar Parishad, Badnawar, Dhar (M.P.)
- v. Shri Jaikishan Sharma, Sub Engineer, MPPCB RO Dhar (M.P.)
- vi. Shri Sarang Puranik, Sub Engineer, Nagar Parishad, Badnawar, Dhar (M.P.)

This report is being filed by the joint committee after conducting the field visit on dated 11/03/2026 and looking into the various issues raised by the complainants and after due discussions with complainant. Due to the absence of the Petitioner's contact details in the Petition copy, co-ordination with him during site visit was not possible.

Nagar Parishad Badnawar:-

Badnawar is a town and Nagar Parishad of the Dhar District in the Madhya Pradesh State. As of 2011 census it has a population of 20,928. The Municipal Corporation, Badnawar has 5230 households. The projected population of Nagar Parishad Badnawar is approximately 26,555.

About Balwanti River:-

The site mentioned in the petition is Balwanti River (Seasonal River), which originates from Pingrola near Village Pitgara, Tehsil Badnawar, District Dhar. The matter referred to in this petition pertains to the Balwanti River. It originates from Village Pitgara, Tehsil Badnawar, located approximately 3.0 Kilometers before the limits of Nagar Parishad, Badnawar. From its source, the river flows in a North western direction and after covering approximately 2.5 Kilometers within the jurisdiction of Nagar Parishad, Badnawar eventually merges with river Bagedi near village Doulatpura, which further meets River Mahi. The Balwanti River is Non-perennial River, carrying water only in rainy season. For the rest of the year, it remains dry, with only domestic sewage flowing through it within the limits of Nagar Parishad, Badnawar.



Issues raised in the Petition: -

The complaint/petition and subsequent judgements in this matter have highlighted the following issues: -

1. Nagar parishad Badnawar, Dirtrict Admistration Dhar and Pollution Control Board should be directed to ensure that the dirty water of any drain including Badnawar municipality area does not reach Balwanti river.
2. All encroachments on the river bank should be removed immediately and the natural flow of the river should be restored.
3. The approved river beautification project worth Rs 16 crore should be implemented in a timely manner and a special committee of NGT should be formed to monitor the work.
4. Action Taken Report (ATR) should be sought from Municipal Council Badnawar, District Administration Dhar and Madhya Pradesh Pollution control Board.

5. Environmental compensation should be imposed on the persons/institutions responsible for discharging dirty drains into the river.

Field observations: -

In compliance of the Hon'ble NGT order and with reference the issues raised in the Petition a Joint committee conducted a site visit. The observations recorded during site visit are as follows:-

1. During the site visit, No natural flow of water was observed in the river, either at the origin or along the force of the river.
2. Domestic sewage was found flowing through the stretch of the river within the jurisdiction of Nagar Parishad Badnawar.
3. A total of 17 drains carrying domestic sewage were observed discharging in to the river.
4. Municipal Solid waste was found at several locations within the river catchment area within the jurisdiction of Nagar Parishad, Badnawar.
5. Within the limits of Nagar Parishad catchment area of the river has not been clearly demarcated.
6. Within the limits of Nagar Parishad, Buffer zone does not exist on either side of the river.
7. During inspection water samples from the three different locations, before entry the Nagar Parishad limit, Behind city bus stand Badnawar and Near proposed location of STP were collected and analyzed by the Regional Laboratory, MPPCB, Indore. Water analysis reports are attached as **Annexure - 2**

Copy of Panchnama recorded during site Inspections dated 11/03/2026 is enclosed as **Annexure – 3**

A) Action Taken by Nagar Parishad Badnawar: -

- A Sewage Treatment Plant (STP) of 3.0 MLD capacity, based on SBR technology, has been proposed by Nagar Parishad, Badnawar, for the treatment of sewage generated from the town. The proposed site is located behind the Government Degree College, Badnawar. The detailed proposal is attached as **Annexure-4**.
- The project includes the interception of 17 drains/outfall sewers through the laying of a sewerage network. The scheme also comprises the construction of interception

and diversion structures for drains, retaining walls, a stop dam, and the sewage treatment plant.


- During the inspection, the work of laying the sewerage network was found to be in progress. It is expected to be completed by June 2027.
- As per the report of the Block Medical Officer, Badnawar (attached), there were not many cases of water-borne diseases reported in the area.
- The river appears to be flowing without any obstruction, and pipeline laying work is ongoing on both sides. The river continues to flow freely in its natural course.
- The Urban Local Body (ULB) regularly carries out cleaning operations of the river. The prohibition and removal of any kind of waste disposal into the river is undertaken as a routine activity.
- The reply to the show-cause notice has been submitted by the ULB vide Letter No. 1116 dated 13/04/2026.


B) Action Taken by M.P. Pollution Control Board Dhar: -

- The Madhya Pradesh Pollution Control Board (MPPCB) has imposed an environmental compensation of Rs. 96 lakh on Nagar Parishad, Badnawar for violations of environmental laws and the rules framed thereunder. A copy of the letter is attached as **Annexure-5**.
- A letter has been sent to the Collector, Dhar (vide Letter No. 466 dated 12/03/2026) for the recovery of the imposed environmental compensation from the local bodies in District Dhar. A copy of the letter is attached as **Annexure-6**.
- A show cause notice has been issued to the Chief Municipal Officer (CMO), Badnawar (vide Letter No. 464 dated 12/03/2026) under the Water (Prevention and Control of Pollution) Act, 1974 and the Environment (Protection) Act, 1986. A copy of the notice is attached as **Annexure-7**.
- A reminder to the show cause notice has also been issued to the CMO, Badnawar (vide Letter No. 464 dated 28/03/2026) under the Water (Prevention and Control of

Pollution) Act, 1974 and the Environment (Protection) Act, 1986. A copy of the letter is attached as Annexure-8.

Photographs of the site taken during inspection are enclosed as Annexure - 9


(Priyanka Mimrot)
Sub Divisional Magistrate
Badnawar, District Dhar (M.P.)


(Ajay Kumar Mishra)
Regional Officer
M.P. Pollution Control Board
Dhar (M.P.)



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Annexure 2

Regional Laboratory M. P. Pollution Control Board

Plot No. 1, Scheme No. 78, Part-II, Aranya, Indore – 452 010
☎ 0731 – 2554337, 4035618 E-mail: regional.labindore@yahoo.com



TEST REPORT

ANALYSIS REPORT FOR WATER & WASTE WATER SAMPLE

Sample From	Balwanti River, Badnawar, Dhar (M.P.)			
Contact No	---			
Sample Description	Water sample behind Badnawar Town.			2885
Date and Time of Collection	11/03/2026	Type of Sample : Grab	Transportation:- Ice Box with Ice	Sampling Method : Water/ Waste water sample collection Guideline by Central lab M.P. P.C.B., Bhopal
Date of Receipt	11/03/2026			
Period of Analysis	11-16/03/2026	Sample collected & Analysed by	Regional Officer, Dhar & S.S. Chouhan, Scientist	Sample volume: 02 Litre
Date of Report	16/03/2026			
S. No.	Parameters	Unit	Result	Method
01	Odour	-	Disagreeable	IS 3025 Part 6 2018
02	pH	pH Unit	7.8	APHA,4500H+B
03	Specific Conductivity	µmho/cm	1851.9	APHA 2510 B
04	Total Solids	mg / L	1827	APHA 2540 B
05	Total Dissolved Solids	mg / L	1781	APHA 2540 C
06	Suspended Solids	mg / L	46	APHA2540 D
07	Chloride	mg / L	244.6	APHA,4500-CL-B
08	B.O.D. (3 days, 27 °C)	mg / L	40	IS 3025,part 44 1993
09	C.O.D.	mg / L	220	APHA,5220 B
10	Ammo. Nitrogen (as NH ₃)	mg / L	0.52	APHA 4500-NH3-F
11	Nitrite Nitrogen (as N)	mg / L	0.18	APHA 4500-NO2-B
12	Nitrate Nitrogen (as N)	mg / L	2.94	APHA 4500-NO3-B
13	Phosphate (as P)	mg / L	2.82	APHA 4500-P-D
14	Total Alkalinity	mg / L	260	APHA 2320-B
15	T- Hardness (as CaCO ₃)	mg / L	360	APHA 2340-C
16	Ca- Hardness (as CaCO ₃)	mg / L	252	APHA 3500-Ca-B
17	Mg- Hardness (as CaCO ₃)	mg / L	108	APHA 3500-Mg-B
18	Sulphate (as SO ₄)	mg / L	73.98	APHA 4500-So4-E
19	T. Coliform	MPN/100 mL	7000	APHA 9221 C
20	Fecal Coliform	MPN/100 mL	1600	APHA 9221 E

NOTE:-The report shall not be reproduced except in full, without permission of Regional Lab, M.P. Pollution Control Board, Indore.
No statutory liability accepted for sample not collected by MPPCB.
The result relate only to the sample tested.
Sample will be destroyed after 10 days from the date of issue of test report unless otherwise specified.

(Authorized Signatory)
(Atul Kotiya)
Chief Chemist
Regional Laboratory, Indore

End of Report

Ch-2
Atul Kotiya
24/03



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Regional Laboratory M. P. Pollution Control Board

Plot No. 1, Scheme No. 78, Part-II, Aranya, Indore – 452 010
☎0731 – 2554337, 4035618 E-mail: regional.labindore@yahoo.com

TEST REPORT

ANALYSIS REPORT FOR WATER & WASTE WATER SAMPLE

Sample From	Balwanti River, Badnawar, Dhar (M.P.)			
Contact No	---			
Sample Description	Water Sample Collected From Before Anaj Mandi (Before Arriving in the city)			2886
Date and Time of Collection	11/03/2026	Type of Sample : Grab	Transportation:- Ice Box with Ice	Sampling Method : Water/ Waste water sample collection Guideline by Central lab M.P. P.C.B., Bhopal
Date of Receipt	11/03/2026			
Period of Analysis	11-16/03/2026	Sample collected & Analysed by	Regional Officer, Dhar & S.S. Chouhan, Scientist	Sample volume: 02 Litre
Date of Report	16/03/2026			
S. No.	Parameters	Unit	Result	Method
01	Odour	-	Disagreeable	IS 3025 Part 6 2018
02	pH	pH Unit	7.4	APHA,4500H+B
03	Turbidity	N.T.U.	12.5	APHA,2130-B
04	Specific Conductivity	µmho/cm	1097.4	APHA 2510 B
05	Total Solids	mg / L	899	APHA 2540 B
06	Total Dissolved Solids	mg / L	853	APHA 2540 C
07	Suspended Solids	mg / L	46	APHA2540 D
08	Chloride	mg / L	107.62	APHA,4500-CL-B
09	B.O.D. (3 days, 27 °C)	mg / L	34	IS 3025,part 44 1993
10	C.O.D.	mg / L	120	APHA,5220 B
11	Ammo. Nitrogen (as NH ₃)	mg / L	0.11	APHA 4500-NH ₃ -F
12	Nitrite Nitrogen (as N)	mg / L	0.26	APHA 4500-NO ₂ -B
13	Nitrate Nitrogen (as N)	mg / L	1.87	APHA 4500-NO ₃ -B
14	Phosphate (as P)	mg / L	1.09	APHA 4500-P-D
15	Total Alkalinity	mg / L	380	APHA 2320-B
16	T- Hardness (as CaCO ₃)	mg / L	316	APHA 2340-C
17	Ca- Hardness (as CaCO ₃)	mg / L	228	APHA 3500-Ca-B
18	Mg- Hardness (as CaCO ₃)	mg / L	88	APHA 3500-Mg-B
19	Sulphate (as SO ₄)	mg / L	70.23	APHA 4500-So ₄ -E
20	T. Coliform	MPN/100 mL	6300	APHA 9221 C
21	Fecal Coliform	MPN/100 mL	920	APHA 9221 E
NOTE:- The report shall not be reproduced except in full, without permission of Regional Lab, M.P. Pollution Control Board, Indore. No statutory liability accepted for sample not collected by MPPCB. The result relate only to the sample tested. Sample will be destroyed after 10 days from the date of issue of test report unless otherwise specified.				


(Authorized Signatory)
(Atul Kotiya)
Chief Chemist

Regional Laboratory, Indore

End of Report




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Regional Laboratory
M. P. Pollution Control Board

Plot No. 1, Scheme No. 78, Part-II, Aranya, Indore – 452 010
☎0731 – 2554337, 4035618 E-mail: regional.labindore@yahoo.com

TEST REPORT

ANALYSIS REPORT FOR WATER & WASTE WATER SAMPLE

Sample From	Balwanti River, Badnawar, Dhar (M.P.)			
Contact No	---			
Sample Description	Water sample near proposed STP 3 MLD behind Government College.			2887
Date and Time of Collection	11/03/2026	Type of Sample : Grab	Transportation:- Ice Box with Ice	Sampling Method : Water/ Waste water sample collection Guideline by Central lab M.P. P.C.B., Bhopal
Date of Receipt	11/03/2026			
Period of Analysis	11-16/03/2026	Sample collected & Analysed by	Regional Officer, Dhar & S.S. Chouhan, Scientist	Sample volume: 02 Litre
Date of Report	16/03/2026			
S. No.	Parameters	Unit	Result	Method
01	Odour	-	Disagreeable	IS 3025 Part 6 2018
02	pH	pH Unit	7.2	APHA,4500H+B
03	Turbidity	N.T.U.	3.5	APHA,2130-B
04	Specific Conductivity	µmho/cm	1832.4	APHA 2510 B
05	Total Solids	mg / L	1547	APHA 2540 B
06	Total Dissolved Solids	mg / L	1465	APHA 2540 C
07	Suspended Solids	mg / L	82	APHA2540 D
08	Chloride	mg / L	219.16	APHA,4500-CL-B
09	B.O.D. (3 days, 27 °C)	mg / L	90	IS 3025,part 44 1993
10	C.O.D.	mg / L	290	APHA,5220 B
11	Ammo. Nitrogen (as NH ₃)	mg / L	0.51	APHA 4500-NH ₃ -F
12	Nitrite Nitrogen (as N)	mg / L	0.27	APHA 4500-NO ₂ -B
13	Nitrate Nitrogen (as N)	mg / L	2.81	APHA 4500-NO ₃ -B
14	Phosphate (as P)	mg / L	2.06	APHA 4500-P-D
15	Total Alkalinity	mg / L	640	APHA 2320-B
16	T- Hardness (as CaCO ₃)	mg / L	280	APHA 2340-C
17	Ca- Hardness (as CaCO ₃)	mg / L	160	APHA 3500-Ca-B
18	Mg- Hardness (as CaCO ₃)	mg / L	120	APHA 3500-Mg-B
19	Sulphate (as SO ₄)	mg / L	74.21	APHA 4500-So ₄ -E
20	T. Coliform	MPN/100 mL	12000	APHA 9221 C
21	Fecal Coliform	MPN/100 mL	3500	APHA 9221 E
NOTE:- The report shall not be reproduced except in full, without permission of Regional Lab, M.P. Pollution Control Board, Indore. No statutory liability accepted for sample not collected by MPPCB. The result relate only to the sample tested. Sample will be destroyed after 10 days from the date of issue of test report unless otherwise specified.				


(Authorized Signatory)
(Atul Kotiya)
Chief Chemist

Regional Laboratory, Indore

End of Report

मान. राष्ट्रीय हरित अधिकरण, सेंट्रल क्षेत्रल केन्द्र, भोपाल में प्रचलित पत्रांक क्र. 28/2026 (संजय कुम्भारे विरुद्ध म.प्र.शासन- व अन्य) में पारित आदेश दिनांक 10/02/2026 के अनुपालन में आज दिनांक 11/03/2026 को संयुक्त समिति द्वारा माथिक। में उल्लेखित स्थल का निरीक्षण किया गया। निरीक्षण के दौरान बदनावर नगर परिषद से प्रवाहित होने वाली बलवंती नदी के तीन विभिन्न स्थानों से जल नमूने एकत्रित किए गए। निरीक्षण के दौरान बलवंती नदी के उद्गम स्थल जाम-~~पिपल~~ - पिपलारा, लह. बदनावर, जिला-धार, बदनावर शहरी क्षेत्र में सब्जी मंडी के छिद्रे, बस स्टैंड के छिद्रे व माथुर कॉलोनी व शास्त्रीय कॉलेज बदनावर के छिद्रे, एलिवेज ट्रीटमेंट प्लांट हेड प्रवाहित क्षेत्र से एवं विभिन्न नामों का निरीक्षण स्थल जो बलवंती नदी में मिलते हैं का निरीक्षण किया गया। निरीक्षण के दौरान माननीय राष्ट्रीय हरित अधिकरण द्वारा गठित समिति के सदस्य एवं अन्य अधिकारी/कर्मचारी उपस्थित थे।

[Signature]
11/03/2026

[Signature]
11/03/26 *[Signature]*

[Signature]
11/03/2026

[Signature]
CMO

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11/03/26
[Signature]
11/03/26



GOVERNMENT OF MADHYA PRADESH

Directorate, Urban Administration and Development

**Detailed Project Report for Rejuvenation and
Beautification of Balwanti River at Badnawar**

UNDER

SWACHH BHARAT MISSION – 2.0

Urban Local Body - Badnawar
DISTRICT - Dhar
DIVISION - Indore



Estimated Project Cost - **1457.73 Lacs**

Chief Municipal Officer
Municipal Council Badnawar
District Dhar (MADHYA PRADESH)




Eco Pro Environmental Services
363-A Mahalaxmi Nagar, Main Road
Indore 452010 (M.P.) - INDIA
Contact: +91-9755013707
E-Mail: ecopro@rediffmail.com

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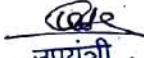
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 उपयुक्ती
 नगर परिषद बदनावर
 जिला धार (म.प्र.)


 मुख्य नगर पालिका अधिकारी
 नगर परिषद, बदनावर
 जिला धार (म.प्र.)

Detailed Project Report for Rejuvenation and Beautification of River Balwanti at Badnawar

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Annexure IV – Testing Reports	


 उपयन्त्री
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 नगर परिषद, बदनावर
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Feasibility Analysis

Balwanti River water is getting polluted as a result of fast-paced urbanisation and absence to waste water management system. At several places in the Badnawar city filthy effluents are disposed of in the river itself. As per a rough estimate, about 1 ton of solid waste from city falls into Badnawar daily. The use of nitrogen fertilisers is common in the basin area; the annual use being 14,000 tons. The total BOD load generation is more than 100 gm per capita per day of which about 50 per cent comes from agricultural activities, cattle raising and human wastes. BOD load is maximum between Bus Stand and Govt. college. The small industries contribute around 30 per cent mainly through food and textile processing. Presently the DPRs were submitted without any CSP and Feasibility Reports. This practice has several disadvantages as mentioned below:

I. ABSENCE OF INTEGRATED APPROACH

The Schemes proposed are independent and disparate and do not get integrated into a plan of area development. Many components Schemes of Pollution Abatement of Rivers will fit into such a plan.

II. EXPLORATION OF OPTIONS


Direct preparation of DPR may result in not properly exploring options to find solutions for the identified problem in a cost effective and sustainable manner and ignoring socio-economic and institutional factors.

III. IDENTIFICATION OF AGENCIES FOR SCHEMES

In the absence of feasibility report identification of agencies that are best suited to handle particular scheme was not necessarily well thought out and reasoned giving rise to the possibility of mismatch.

Municipal Council Badnawar has appointed M/s. Eco Pro Environmental Services, Indore to perform consultancy services in the ULB of Badnawar, for Preparation of Feasibility Report and Detailed Project Reports of Balwanti River. The report is being framed after detailed topographical, socio-economic surveys and meetings with officials of the ULB, stake holders, elected parishad members (Parshad/corporator), prominent citizens of Badnawar town. Various suggestions were gathered and after consent from Nagar Parishad, Badnawar, proposals are drawn.


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1.2 About Urban Local Body

Badnawar (or Badnavar) is a Town, former pargana and a Nagar Parishad of the Dhar district in the state of Madhya Pradesh, India. This is a tehsil place having 170 villages. Badnawar is around 95 km from Indore - the business capital of Madhya Pradesh.

Acharya Jinasena started the composition of Harivamsa Purana here in AD 783. Jayavarmadeva, A Paramara ruler, had issued a grant mentioning Vardhamanapur, which was found at Ujjain. Some of the ancient Jain images found here are now displayed in the Digambar Jain Museum Ujjain. Approximately twenty inscribed images have been found here that date from Samvat 1122 to 1308. Several of them mention Vardhanapur or Vardhamanapura as the name of the city and some mention a Jain community named Vardhamanapuravaya (now called Badanera). Ancient Jain images continue to be found here. There is a very ancient Dharmaraja temple here. There is an old Jinda Samadhi in the temple complex. There is a very old gymnasium in the temple complex.

Badnawar was a pargana given to Raja Rai Singh, second son of Maharaja Ratan Singh Rathore founder of Ratlam and governor of 16 parganas of north Malwa in 1658, before the fatal battle of Dharmat (Fatehbad near Ujjain) against Mughal Aurangzab where Ratan Singh Rathore was killed and Rai Singh escaped wounded, in 1733 it came under Maratha rule by the conquest of Malwa by Peshwa Bajirao. Badnavar fell under Dhar ruled by the Maratha Sardar Puar. In 1818 Raja Bhagwant Singh was compelled to move to Kachhi Baroda and a settlement was made by Sir John Malcome of the British East India Company. Badnawar region, included 4 prominent jagirs (feudatory (e)states), all held by Rajput: Bakhatgarh (32 villages) Multhan (29 villages), Kachhi Baroda (18 villages), Dotrea and Bidwal (8 villages).

The place is evidently an old one as it has yielded old monuments, the earliest of which is of the 11-12th century A.D. and it has a magnificent Shaiva temple repaired later on. Besides this, there are three other temples of a later period including one called Udanya temple. A few images have been found here bearing dates Vikram Samvat 1219, 1229 and 1336 corresponding to A.D. 1162, 1172 and 1279, respectively. The town has an old

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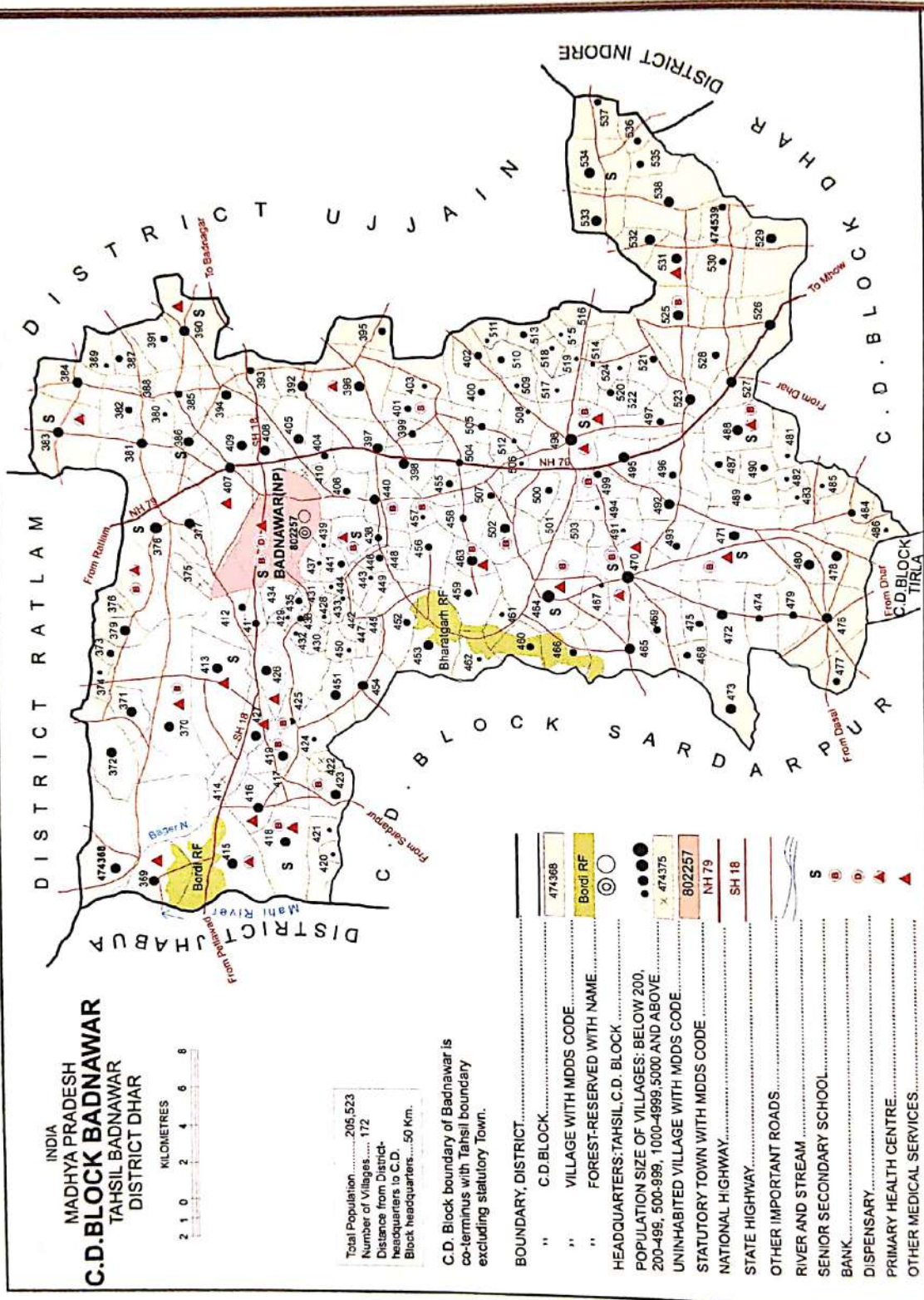
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mosque constructed in A.D. 1688 and the remains of the fortress or garhi mentioned by Abul Fazl.

Badnawar is located at 23° 1'10.89"N 75°13'55.14"E. in Western Madhya Pradesh. Badnawar is located around 262 km from state capital Bhopal. It has an average elevation of 505 meters. As of 2011 India census, Badnawar has a population of 20,928. Males constitute 52.03% of the population and the females 47.97%. Badnawar has an literacy rate of 81.3%, with 88.7% of the males and 41% of females literate. Among the CD Blocks of Dhar District, the highest percentage of literacy rate has been registered in Badnawar CD Block (62.81 per cent) as per Census 2011.



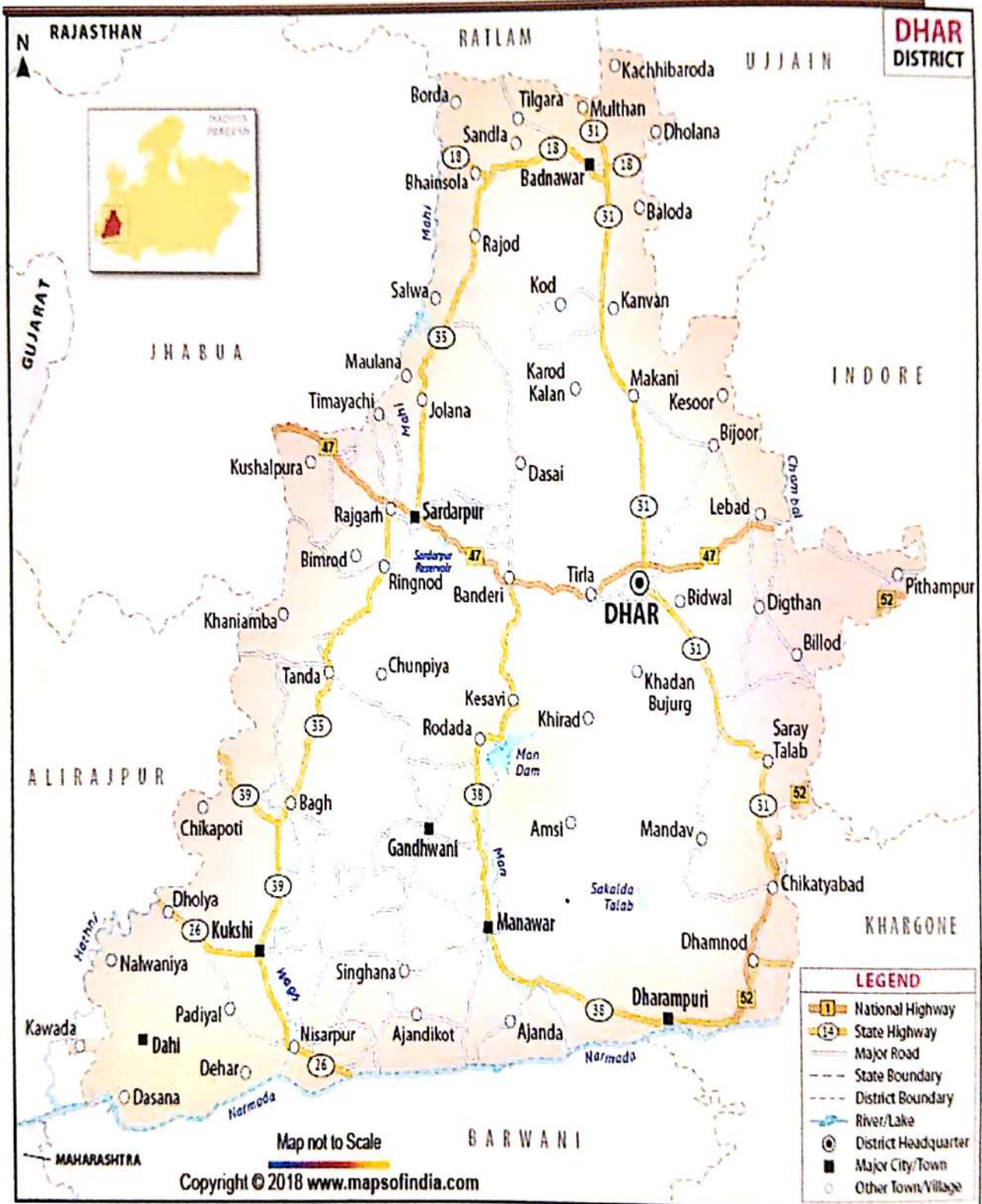
Detailed Project Report for Rejuvenation and Beautification of River Balwantl at Badnawar



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1.3 Climate

The district enjoys a pleasant climate. It is generally dry except in the monsoon season. The year may be divided into four seasons. The hot season from March to about the middle of June is followed by the monsoon season lasting up to end of September. October and November may be termed the post-monsoon season. The period from December to February is the cold season. There is no meteorological observatory in the district. After February there is steady increase in temperatures. May is the hottest month with the mean daily maximum at about 40°C. The days are very hot during the summer with the maximum temperature on individual days sometimes rising up to about 44°C or 45°C. With the onset of the south-west monsoon by the second week of June there is appreciable drop in temperature and the weather is cool and pleasant. In September, day temperature rises and in October, it reaches a secondary maximum. After October, day and night temperature decrease rapidly, January is generally the coldest month with the mean daily maximum at about 27°C. And the mean daily minimum at about 10°C. Cold waves affect the district in the area of passing western disturbances across northern India and the minimum temperature may drop down occasionally to about the freezing point of water. Winds are generally light in the post-monsoon and winter seasons and strengthen in the summer and monsoon seasons. Winds blow mostly from direction between southwest and north-west during the monsoon months. In the post - monsoon and winter seasons the winds are mainly north-eastern or eastern. By March winds from directions between south-west and north-west appear and by April these become predominant and continue in the rest of summer and the monsoon season. The average annual rainfall in the district is 833.1 mm.

1.4 Flora and Fauna

In nearby areas of Badnawar following trees are easily found: achar (*Buchanania latifolia*), amaltas (*Cassia fistula*), bans (*Dendrocalamus strictus*), mahua (*Madhuca indica*), neem (*Melia indica*), palas (*Butea frondosa*), shisham (*Dalbergia sissu*) and tendu (*Diospyros melanoxylon*). The edaphic sub-type I dry teak is found on the middle and lower slopes of the Vindhya scarp on the mixed black and sandy granite soil.


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Under very dry conditions, scanty cover of infertile and crystalline rock soils very poor quality of teak forests is found on the upper contours of the Vindhyan scarps. The percentage of teak decreases with the increase of dry deciduous species like, salai, dhava, saja, aonla, reunjha, moyan, etc. An increase in the shrubs, herbs, grasses and climbers is clearly marked. The Mixed forests vary from the general type. They admixture a large number of species to dry types like that of salai and the maltreated areas of scrubs and grasses, they occupy the south western part of the district and stray hills south of scarps. Mostly in degraded conditions, of the over wood and underwood are hardly distinguishable. Among the associates salai, anjun, rohan, dhaora, saj and chloroxylon swieteniaq are most widespread. The edahic subtype of the dry deciduous mixed forest is found over the dry hills and ridges of Ramgarh, Jamli, Neemkheda, Manasamal and Mian pahad forest block. Salai occurs to over 50 percent of the crop on the limestone coralline limestone, and quartz.


The denuded ground and dry and shallow soil under the stemmed and crooked stock of babul, pilu chandar, bel, hingan, sindi, etc. indicate that these have been converted to the present stage from Dry teak forests. Apart from domestic pets and beats of burden all the ordinary fauna is found in the district.

Among the primate's, langur (*Semnopithecus-entellus*), and common monkey (*Macacus sinicus*), among carnivora tiger called bagh, sher or nahar (*Felis tigris*), panther (*Felis pardus*), hyena (*Hyena stīrata*), among rodents the black buck (*Anletope cervicapra*) sambhar (*Cervus unicolour*) or wild bear (*Sus cristatus*), are found. Among the birds, common migrating fowl along with many species of ducks and snipes partridge quails and sang grouse are easily met with. Crocodiles are found in the river Narmada and Chambal. Among the reptiles cobras, vipers and the poisonous snakes are commonly found. There, however, have not been any losses to human lives attributable to wild animals.

1.5 About River Balwanti

Balwanti River was prime source of Water for Town Badnawar in earlier decades. About 15 to 20 km long, this river originates from Pingrola near village Pitgara. Which


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joins the Bagedi river near Daulatpura village of Sangvi village panchayat via Badnawar, village Kheda and Nageshwar. The water of about 20 villages gets mixed in Balwanti River. It flows through two towns and two gram panchayats, Pitgara and Kheda. Being a rural area, it comes under the district. While passing through the heart of the Badnawar city, around 4Km part comes under the Municipal Council. It was said by local peoples that the river was once very clean that water from the river was used for drinking purpose.

Along the Bank of River Balwanti there are important places including Anandeshwar Mahadev Temple, Dharmaraj Temple, Nageshwar Dham etc. temples, but the devotees are troubled by the stench spreading from the river. The condition gets worse during summer.

Considering the status of River Balwanti, Local Body decided to take cognizance for its Rejuvenation and Beautification under the Municipality Area. In the year 2020 based on prima facie it was studied that the main source of River pollution is Domestic Waste Water which is directly or indirectly discharges into river via Nallahs etc.



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जिला धार (म.प्र.)



Badnawar, Madhya Pradesh, India


lala lajpat ray marg, near bus stand, Nayapura, Badnawar, Madhya


Pradesh 454660, India

Lat 23.021472°

Long 75.234977°

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Chapter 2 – Population Projection

The Municipal Council Badnawar has total 5230 families residing in Badnawar. Badnawar has population of 20917 of which 10872 are males while 10046 are females as per Population Census 2011. Average Sex Ratio of Badnawar city is 924 which is lower than Madhya Pradesh state average of 931. Badnawar city has higher literacy rate compared to Madhya Pradesh. In 2011, literacy rate of Badnawar city was 80.39 % compared to 70.6 % of Madhya Pradesh.

2.1 Population of Old Decades

Year	Population	Decadal Growth Rate (in %)	Average Annual Growth Rate (in %)
1971	9130	NA	NA
1981	11282	21.4	2.14
1991	15143	29.9	2.99
2001	17746	16	1.6
2011	20917	16.6	1.66

Source: Census of India

2.2 Forecast Population

Even after having recent/current population of a town or a city it is important to forecast population and its rate of growth for the design life. Estimation of population takes into consideration factors governing character & location of town, present status and its possible expansion, establishment of commercial, educational, industrial, social and administrative areas in the surrounding. Floating population is also a matter of consideration while forecasting the population. The most reliable information on population of the ULB is obtained from ULB itself and Census.

Population Forecasting Calculation for Badnawar Nagar Prishad, Dist- Dhar (M.P.)					
ANNEXURE 1: POPULATION PROJECTIONS			Name of ULBS	Name of District	
			Badnawar	Dhar	
EXISTING DETAILS OF POPULATION					
Year	Existing Average Growth Rate	Population	Average Increase	Incremental Increase	Percentage Increase
1961		6821			
1971	3.39%	9130	2309		0.34
1981	2.36%	11282	2152	-157	0.24
1991	3.42%	15143	3861	1709	0.34
2001	1.72%	17746	2603	-1258	0.17
2011	1.79%	20917	3171	568	0.18
			14096	862	0.0008
Value of 'N'		6	5	4	5
Average			2819	216	0.24
			(Mean)	(Inc. mean)	(Geo. rate)
Reference			X	Y	r _g
Population P ₁		20917			(Negative Excluded)
METHODS USED FOR POPULATION PROJECTIONS					
1. Arithmetical Increase Method $P_n = P_1 + nX$			1. Airthmetical method projects population between Incremental and Geometrical Growth Rate Method.		
2. Incremental Increase Method $P_n = P_1 + nX + n(n+1)Y/2$			2. Geometrical growth method give the higher side of the Population forecast in the coming thirty to fifty years.		
3. Decadal Growth Method $P_n = P_1(1 + r_d/100)^n$			3. Airthmetical Increase Method give the Higher side of the Population forecast in the coming thirty to fifty years.		
4. Geometrical Growth Method $P_n = P_1(1 + r_g/100)^n$			4. Adopted Population Projections: Population Projected by Incremental Increase Method as it gives more realistic value.		
Where					
X is a airthmetical mean					
Y is a incremental increase mean					
r _d is a decadal average growth ratio					
r _g is a geometrical average growth ratio					
P ₁ is a reference population					
n is a number of decade from reference year					
N is a no. of decades whose data has been taken in calculation					

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SUMMARY OF PROJECTED POPULATION					
Summary of Design Population forecast by adoping			Incremental increase method		
Year	Population Projection by Airthmetical Increase Method (A)	Population Projection by Incremental ncrease method (B)	Population Projection by Average (B)	ADOPTED POPULATION FOR DESIGN (D)	Average Growth Rate (in %)
2021	23736	23952	24559	23952	-
2022	24018	24267	24948	24267	1.32%
2025	24864	25226	26146	25226	1.32%
2030	25992	26535	27816	26535	1.04%
2035	27401	28219	30029	28219	1.27%
2040	29093	30312	32889	30312	1.48%
2045	30220	31749	34931	31749	0.95%
2050	31630	33595	37653	33595	1.16%
2055	33321	35881	41193	35881	1.36%
CALCULATION OF PROJECTED POPULATION BY DIFFERENT METHODS					
Year	Value of 'n'	Arithmetical Increase Method	Incremental Increase Method	Geometrical Method	Average of AI, IIM & GM Method
2020	0.9	23454	23638	25431	24174
2021	1.0	23736	23952	25990	24559
2022	1.1	24018	24267	26560	24948
2023	1.2	24300	24584	27143	25342
2024	1.3	24582	24904	27739	25742
2025	1.4	24864	25226	28348	26146
2026	1.5	25146	25550	28970	26555
2027	1.6	25428	25876	29606	26970
2028	1.7	25710	26205	30256	27390
2029	1.8	25992	26535	30920	27816
2030	1.9	26273	26867	31599	28246
2031	2.0	26555	27202	32292	28683

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2032	2.1	26837	27538	38881	28179
2033	2.2	27119	27878	39125	28516
2034	2.3	27401	28219	39389	28859
2035	2.4	27683	28562	39661	29209
2036	2.5	27965	28908	39945	29569
2037	2.6	28247	29256	40235	29939
2038	2.7	28529	29605	40533	30319
2039	2.8	28811	29957	40839	30709
2040	2.9	29093	30312	41151	31109
2041	3.0	29375	30668	41473	31529
2042	3.1	29657	31027	41804	31959
2043	3.2	29938	31386	42144	32409
2044	3.3	30220	31749	42494	32879
2045	3.4	30502	32114	42854	33369
2046	3.5	30784	32481	43224	33879
2047	3.6	31066	32850	43605	34419
2048	3.7	31348	33222	43999	34989
2049	3.8	31630	33595	44405	35579
2050	3.9	31912	33971	44823	36189
2051	4.0	32194	34349	45253	36819
2052	4.1	32476	34729	45695	37479
2053	4.2	32758	35111	46149	38169
2054	4.3	33040	35496	46615	38889
2055	4.4	33321	35881	47093	39629

Source: Analysis by the consultant

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2.3 Ward Wise Pollution Details

Based on the details provided by ULB ward wise population is estimated:

BADNAWAR WARD WISE POPULATION							
S. No.	Ward Name	2011	2021	2022	2025	2040	2055
1	Patel ward	2699	3091	3131	3255	4244	5315
2	Nehru Ward	1155	1323	1340	1393	1816	2275
3	Lal Bahdur Sastri ward	976	1118	1132	1177	1535	1922
4	Gandhi Ward	960	1099	1114	1158	1509	1891
5	Bhagat Singh Ward	676	774	784	815	1063	1331
6	Subhash Ward	1358	1555	1575	1638	2135	2674
7	Azad Ward	2306	2641	2675	2781	3626	4541
8	Chandara Sekhar ward	505	578	586	609	794	995
9	Annapurna ward	2423	2775	2811	2922	3810	4772
10	Rajendra Ward	889	1018	1031	1072	1398	1751
11	Kabir ward	845	968	980	1019	1329	1664
12	Ambedkar ward	851	974	987	1026	1338	1676
13	Malviya Ward	1277	1462	1482	1540	2008	2515
14	Tilak ward	1977	2264	2294	2384	3109	3893
15	Rajiv Ward	2020	2313	2344	2436	3176	3978
	Total Population	17063	23952	24267	25226	32889	41193

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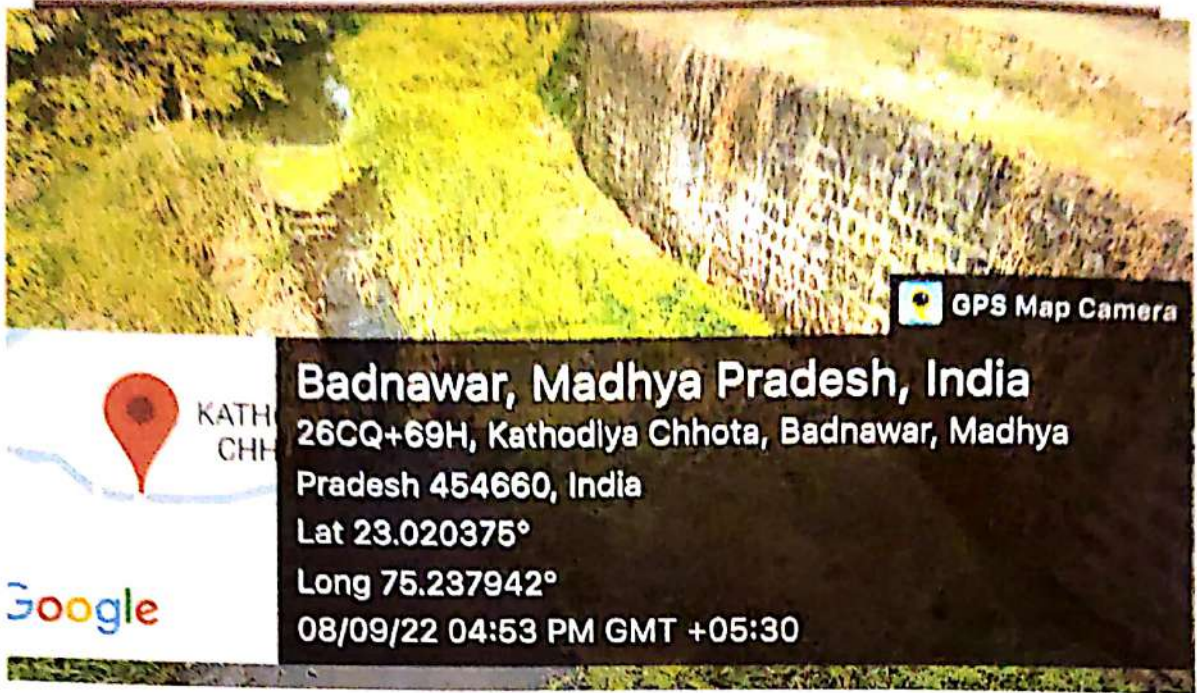
Chapter 3 – Site Details and Survey

Prior to actual start of work at the dumpsite, an Extensive Survey of the existing conditions of the river is conducted in order to obtain real and accurate data. This will enable to draw up the practical options to meet the objectives, and will be used for Rejuvenation and Beautification of River Balwanti at Badnawar for Badnawar Municipal Council.

Meeting with officials of Badnawar Municipal Council



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Picture of Balwanti River

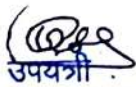


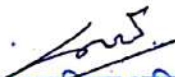
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Pictures During Survey of Balwanti River



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Pictures During Survey of Balwanti River


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Following gap analysis has been done based on Survey:

S. No.	Problem	Status	Proposed Solution
1.	Waste Water Discharge into River	No Interception of Sewer Drains	Interception of 10 drains.
2.	Sewer line along River side	No Line installed.	Trunk Main is proposed to cater Waste Water
3.	Waste Water Treatment	NO STP installed	STP is Proposed
4.	Water Level in River is very Low	No Water Retaining Structure	Stop Dam is proposed.
5.	Dilapidation of River Bank	Structure is not present at Some stretch.	Retaining Wall and Stone Pitching Work is proposed on Bank of River.


3.1 Existing Water Supply Details

It shall be ensured that the existing water supply or under execution, has the potential to meet the water demand of the projected design population at the rate of 135 LPCD specified. ULB is committed to ensure desired water supply rate of 135 LPCD in all sewerage districts/all municipal wards of Badnawar town.

As River is passing from the town, water is pumped from river at various points by inserting motor. Town receives around 2.0 MLD water from surface source. Around 1.5 MLD water is extracted from ground water. Presently, the town is drawing 40% of supplied water every day from the ground source. There are 7 tube wells, 36 hand pumps and 28 stand posts in the town. So total water supplied to the town is 3.5 MLD from both ground and surface sources at the rate of 135 LPCD.

Water is supplied for a total of 4 hours per day during winter and 2 hours per day in summer. Badnawar has very infrequent and interrupted water supply due to frequent and untimely power cut. The current water supply system is severely dependent on electricity.


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3.2 Existing Waste Water Management System

Badnawar lacks in proper underground sewerage system. At present the waste water from bathrooms and kitchens from households is disposed off into open fields or drains in front of houses. This sullage/sewage is being disposed into nearby open drains at various locations in the town without any treatment. The domestic waste water presently passes through the open drains along the road side. In the areas not served by any kind of drainage network, the waste water flows on the roads and in few places get stagnated.

The overflow of septic tanks together with the grey water is disposed of in open drains and subsequently into open areas / nalla. There is one major nalla near Bus Stand which is taking all sewage/sullage of ward no. 8 to 13. Drains are used to dispose off effluents from septic tanks and pit latrines. In some cases, direct raw sewage is also being let out in open drains. In most of the areas sewage, sullage and storm water are discharged into open drains, which are in turn connected to nearby open channels.

There is absence of sewage treatment facility in the town. Untreated sewage and sullage is transported through surface drains in all parts of the town to be let out raw into the water bodies/nalla creating unhealthy environments. Although the town has poor sewerage and sanitation condition, even then the town does not have any proposal of sewerage/sanitation project till date.

UTILISING AN EXISTING SYSTEM

There is no organized sewerage system in existence and hence utilisation of existing sewerage system does not arise.

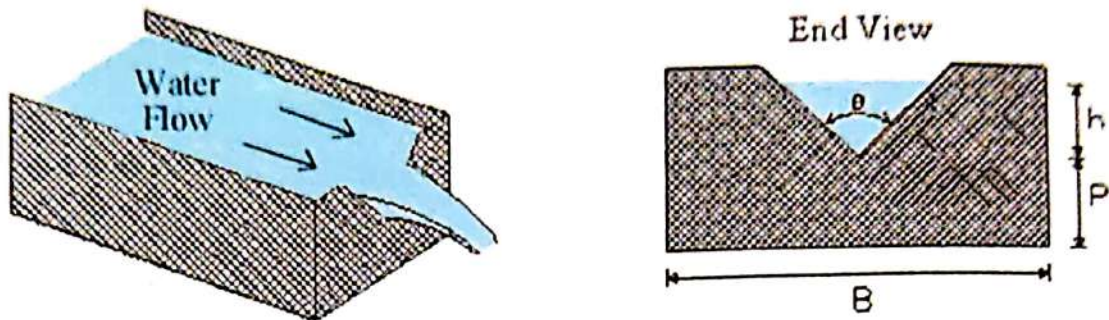
3.3 Waste Water flow carried by drains

Methodology for Waste water flow Measurements:

Waste water flow of various drains was measured by a 90° V-Notch. V- Notch plates are typically installed in open channels such as streams to determine discharge (flow rate). The basic principle is that discharge is directly related to the water depth above the crotch (bottom) of the V; this distance is called head (h). The V-notch design causes small changes in discharge to have a large change in depth allowing more accurate head measurement than with a rectangular weir.

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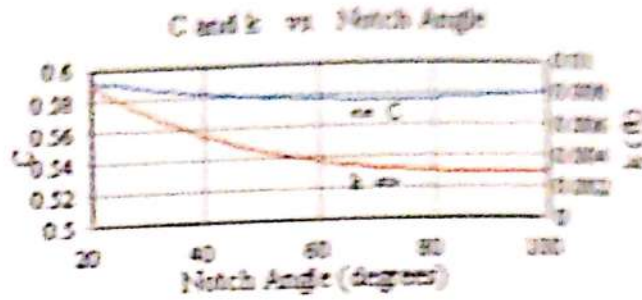
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For measurement of quantity of waste water by V-Notch method, the basic principle is that discharge is directly related to the water depth above the crotch (bottom) of the V; this distance is called head (h). After measurement of ' h ', the total discharge " Q " can be calculated by formula given below.

$$Q = 4.28 C \tan\left(\frac{\theta}{2}\right) (h+k)^{5/2}$$

where Q = Discharge (cfs)
 C = Discharge Coefficient
 θ = Notch Angle
 h = Head (ft)
 k = Head Correction Factor (ft)



Flow Measurement Sheet

Duration of flow measurement	no. of hours	h' (Height of Sewage at V-Notch in ft.)	k	h+k	(h+k) ^{2.6}	Discharge (cuf/s)	Q = Discharge m ³ /s	Q = Total discharge (ML)
6 am to 11 am	5	0.18	0.09	0.27	0.04	0.09	0.003	0.045
11 am to 4pm	5	0.25	0.09	0.34	0.07	0.17	0.005	0.065
4pm to 7 pm	3	0.2	0.09	0.29	0.05	0.11	0.003	0.057
7pm to 10 pm	3	0.18	0.09	0.27	0.04	0.09	0.003	0.045
10 PM to 6 AM	8	0.15	0.09	0.24	0.03	0.07	0.002	0.036
Total Discharge/Day								0.27 MLD

3.4 Soil Testing

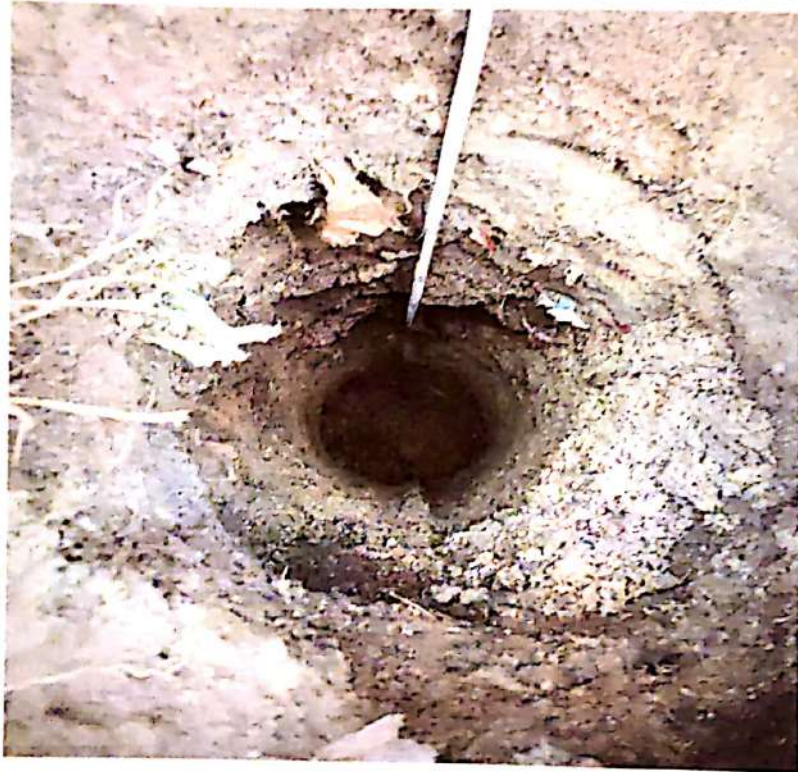
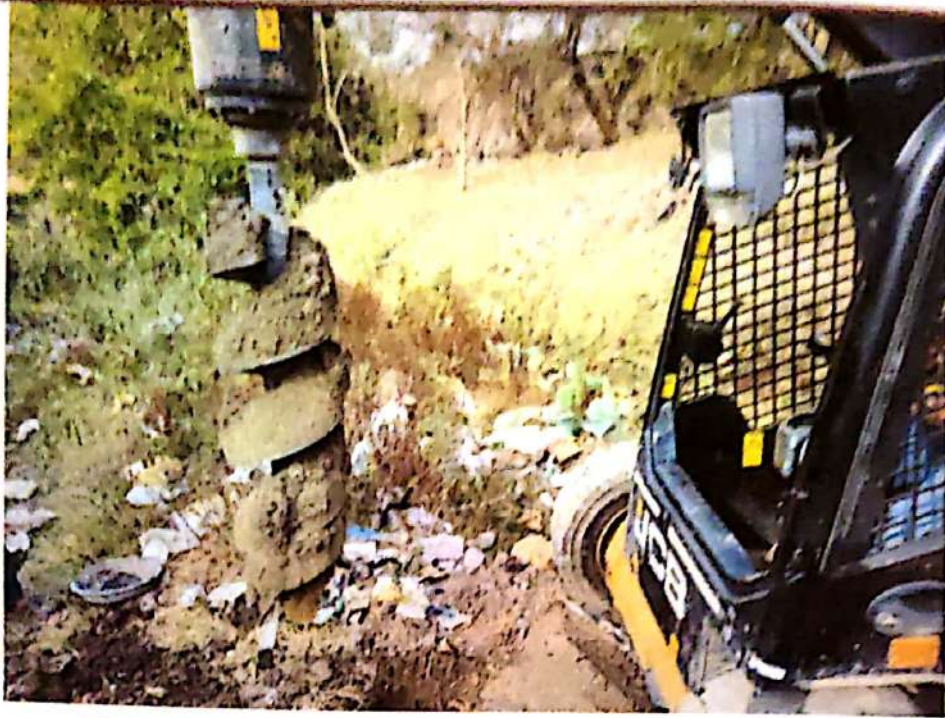
The subject of load bearing capacity of soils is of great importance to Engineers who have to design foundations for buildings and structures which are heavy, large and tall. Such structures are required to be put to meet the varying requirements which have come about in the work of substantial. More important the structure is, greater is the need to give attention to design and construction of its foundation.

Test report is attached in annexure IV.


Eco Pro Environmental Services

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Chapter 4 – Design Parameters

Sewerage system is an intricate civil Engineering work which is designed for two extreme conditions of minimum flow in the initial range of population and maximum flow for design period loads with conditions of extreme (minimum non-silting and maximum non-scouring) velocities and depth of flow in the conduit. In case sewer connections are not done for a longer period without any flow, the assets created may become non-functional. Therefore, it is envisaged to give provision of sewer to individual all households, commercial and institutional limits in the town.

Sewerage scheme is designed only for DWF (dry weather flow) i.e. designed as separate system and not as combined system for Techno-economic reasons, as practiced in India following guidelines of CPHEEO.

In case of combined system, we shall have to spend 3.5 times more for collection and transmission of sewage and then also due to dilution of sewage, functioning of STP becomes inefficient Therefore DPR for sewerage system of the city has been considered as Separate System.

Four phases of sewerage system:


There are four phases of any sewerage system which comprises as follows.

1. Connectivity of households with public sewers, collection and conveyance inclusive sewers and sewage pumping station.
2. Transport of sewage from sewage pumping station to sewage treatment plant by pumping of sewage by means of force main.
3. Sewage Treatment plant
4. Disposal of effluent to nearby water bodies/nalla after treating to the standard norms to discharge into flowing water body.

4.1 Municipal Wastewater Components

CPHEEO Manual stipulates that generally 80% of the water supply may be expected to reach the sewers. As per prevailing norms of 135 LPCD of water supply, per capita sewage generation is considered as 80% of 135 i.e. 108LPCD. Industries, commercial buildings etc. that often use water other than the municipal supply may discharge their


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liquid waste into the sanitary sewers. Such quantities are proposed to be considered during design.

4.2 Peak Factor

For contributory population

- 1) Peak Factor 3 shall be adopted for population up to 21,000
- 2) Peak Factor 2.5 shall be adopted for population up to 21,000 to 51,000
- 3) Peak Factor 2.25 shall be adopted for population up to 51,000 to 7,51,000
- 4) Peak Factor 2.5 shall be adopted for population above 7, 51,000

4.3 Ground Water Infiltration

Estimate of flow in sanitary sewers may include certain flows due to infiltration of ground water. Since sewers are designed for peak discharges, allowances for ground water infiltration for worst conditions in the area should be made. Ground water seeps into the sewers through leaky joints, manholes and through cracked pipes seepage's potential varies with:


1. Ground water table
2. Rainfall condition
3. Soil permeability
4. Workmanship of laying sewer and construction of manholes

Infiltration can be considered, vide Para 3.2.7 Manual stipulation: minimum-maximum- 5000-50000 liters per day per hectare or 500-5000 liters per day per km length of sewers or 250-500 liters per day per manhole for sewers laid below ground water level.

While designing a sewerage system, the following points should be kept in view:

- (a) The out-fall point should be very carefully selected first and then adhered to strictly. While selecting the out fall points, the direction of wind should also be kept in view so that waft of bad odor are avoided. All town improvement and town planning schemes should be carefully considered so that shifting of out-fall point with the growth of town in that directions is avoided.
- (b) The scheme should be started from out fall end so that sewers may be utilized from the beginning, thus ensuring that the functioning of scheme has not to wait for till the completion of the entire scheme.



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- (c) The scheme should be planned in progressive stages so that investment yield benefits from the beginning. To ensure that various stages fit in the main scheme, the scheme should be planned as a whole and various stages worked out thereafter.
- (d) Method of treatment or disposal should be decided while preparing the project, instead of postponing it till the completion of the scheme.
- (e) Sewerage should not be introduced without ensuring adequate water supply.

Solid waste is of great concern to our environment, especially sewerage systems. Collecting plastic bags from dumping ground, river side, ponds is a general scene everywhere in urban areas where pace of solid waste generation is very fast & quantum for handling is huge & poor. Flooding of all residential places in many cities surrounded by major rivers is common, due to unmanaged solid waste & sewage disposal systems.

BADNWAR WATER DEMAND CALCULATION								
Sr. No.	Parameter	Rate	Unit	Year				Remarks
				2022	2025	2040	2055	
1	Population		nos	24948	26146	32889	41193	
2	Floating Population		nos	1247	1307	1644	2060	
3	Water Demand	0.000135	mld	3.37	3.53	4.44	5.56	
4	Floating Population Water Demand	0.000045	mld	0.06	0.06	0.07	0.09	
5	Total Water Demand (Including floating)		mld	3.42	3.59	4.51	5.65	
Waste Water Generation								
1	Used Water for Generation Population	80 % of Water demand	mld	2.69	2.82	3.55	4.45	
2	Used Water for Floating Population	80 % of Floating Water demand	mld	0.04	0.05	0.06	0.07	
3	Total Used Water generation			2.74	2.87	3.61	4.52	
Note: In accordance with standard norms / latest design criteria interception factor has been adopted 0.80 sewage generation has been calculated based on 0.80 interception factor.								


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4.4 Safe Distance between two Water Supply and Sewer Lines

(a) Location Of Water Mains

For roads wider than 25 meters, the water distribution pipes should be provided on both sides of the road, by running rider mains suitably linked with trunk mains. (Refer Manual on WS - CPHEEO Govt. of India (1999) Para 6.10.4.2 (p138-139), 10.3.8 (p362), Para 10.11.1 & 10.11.2 (page 388), CPHEEO MANUAL Govt. of India (1993) ON SEW & SEW. TREATMENT- Para 21.3.3.2.

(b) Laying And Jointing Of Water Pipes


As a rule, trenching should not be carried out too far ahead of pipe laying. The trench should be as narrow as practicable. This may be kept from 0.30 meter over the outside diameter of pipe and depth may be kept at 0.60 - 1.0 meter depending upon traffic conditions. If trucks, Lorries, or other heavy traffic will pass across the pipeline, concrete tiles 600 x 600 mm of suitable thickness and reinforcement should be laid about 2m above the pipe to distribute the load. If the pipeline crosses a river, the pipe should be buried at least 2m below bed level to protect the pipe.

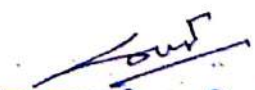
(c) Horizontal Separation

A Water pipe line should be laid such that there is **at least 3 meters** separation, horizontally from any existing or proposed drain or sewer line. If local conditions prevent this lateral separation, a water main may be laid closer to a storm or sanitation sewer, provided that the main is laid in a separate trench, or on an undisturbed earth shelf located on one side of sewer at such an elevation that the bottom of the water main is at least 0.5 meters above the top of the sewer .If water table rises above the bottom of the leach pit ,the safe distance should be kept as 8m.If this cannot be achieved then the pipe should be completely encased to a length at least 3m.on either side of leach pit.

(d) Vertical Separation

In situations where mains have to cross house sewer, storm drain, or sanitary sewer, it should be laid at such an elevation that the bottom of the water main is **0.5 meter above the top of the drain or sewer** with the joints as remote from the sewer as


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possible. This vertical separation should be maintained for a distance of 3 meter on both sides measured normal to the sewer or drain it crosses.

Steps involved in designing of sewer are:

- (1) Determine the present peak flow in $Lps=Qip$ =Present (initial) population load
- (2) Determine the ultimate peak flow in $Lps=Qup$ Ultimate (designed) population load on the pipe section .
- (3) Determine the slope of pipe for present peak flow and min. velocity of 0.6m/sec.
- (4) Determine the slope of pipe to ultimate peak flow as to achieve velocity of 0.8m/sec (max.).
- (5) Critical of above two slopes is the slope of pipe to be laid, If Ground slope is flatter than the critical slope is to be provided. If Ground slope is steeper follow ground slope subject to condition of velocity with in Min. 0.6m/sec (Initial) to Max. 1.5m/sec for SW. and Min. 0.8m/sec (Ultimate) to 3m/sec for RCC pipes. Determine the nearest commercial diameter of pipe such that depth of flow is close to the specified values (maximum 0.8 full flow) for the ultimate peak flows. Choose nearest smaller commercial diameter pipe than theoretical diameter will give slightly more depth of flow, but will be economical. A commercial bigger diameter pipe is chosen than theoretical dia. of pipe will give slightly lesser depths of flow than specified, but will be costlier.
- (6) Fix the crown levels of pipe considering the cushion depths required, slope and length of sewer.

4.5 Design of Main Trunk Line

The Waste Water collection system is analysed and designed using Manning's formula.

The general expression of the Manning's formula is:

$$V = 1/n (R^{2/3}) (S^{1/2})$$

Where, V = Velocity in pipes in m/s

S = Slope of Hydraulic Gradient

R = Hydraulic radius in meters

n = Manning's coefficient

Manning's roughness coefficient is considered as 0.013 for RCC new pipes.

4.5.1 Minimum Depth of Cover

To facilitate connection of house sewers to branch sewers and provide protection to sewers from external loads, the minimum depth of cover as far as possible for sewers is proposed to be 1 m. In case of non-availability of adequate cover or laying of sewer in small lanes of old city where it is difficult to excavate for deeper trench to maintain standard cover of 1 m, lower cover shall be provided with full encasement of pipes in cement concrete.

4.5.2 Minimum Diameter of Pipe

Minimum size of sewer shall be kept as 150 mm in the areas where the flows are very less or being connected to the existing 150 mm pipe. Minimum size of newly proposed pipes shall be of 200 mm.


4.5.3 Design Capacity of Pipe


Sewers will be designed to carry estimated peak flows generated for the development in the design year 2048 to run 80% full at ultimate peak flow. For hydraulic design of sewers, it has been ensured that depth of flow (d) does not exceed 0.8 times the pipe diameter (D) i.e. $d/D \leq 0.8$ at ultimate peak flows, and the velocities do not exceed 2.5 m/sec.

The sewerage system would not be designed for private layouts/areas. However, the wastewater generated from these layouts/areas would be considered for design further network and trunk main. Provision for connecting these layouts/areas to the proposed system would be made.

4.5.4 Self-Cleansing Velocity

To ensure that deposition of suspended solids does not take place, minimum self-cleansing velocities will be considered in the design of sewers. Minimum partial flow velocities of 0.6 mps at present peak flow and 0.8 mps at ultimate peak flows are suggested.


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The desired minimum (self cleansing) velocity may not be achieved at the beginning or later of commissioning due to low flows, it is recommended that suitable arrangements like mobile flushing tanks for cleaning and flushing of those sewers are implemented by the sewer maintaining line agencies.

Maximum velocity (scouring velocity) has been restricted to 2.5 m/s. Where in some stretches where velocity is achieved more than 2.5 m/sec due to very steep slopes DI pipes will be considered to avoid scouring of pipe material.

4.5.5 Bedding for Pipe

The type of bedding (granular, concrete cradle, etc) shall depend on the width of trench, depth at which the sewer pipe is laid, the class of superimposed load considered based on the traffic condition and type of strata at the bed level. The type of bedding to be used for the particular type of pipes, depending on the specified depths shall be as per the guidelines of CPHEEO' "Manual of Sewerage and Sewage Treatment".

4.5.6 Manhole

Manholes shall be provided at junctions, change of sewer size, gradient and direction. The design shall depend upon the depth and the diameter of sewer. The spacing between manholes has generally been kept at 30 m centre to centre for sewers up to 450 mm diameter. For pipe diameter range 500-900mm the manhole spacing shall be 45 m or at suitable interval on straight runs / stretches to facilitate house sewer connection. For pipes greater than 1000 mm diameter the manhole spacing shall be 90 m. The details of Manholes and its sizes adopted are as shown below:

The manhole frame and cover shall be of heavy duty (HD-35) & (HD-20) Steel Fiber Reinforced Concrete (SFRC) capable of withstanding loads of 35 tonnes for main roads and 20 tones for side lanes, conforming to IS 12592 (Part I & II).

(a) Manhole Construction

The present local practice is to adopt brick masonry for construction of manholes due to local availability of bricks in abundance at cheaper rates and the same shall be followed.

(b) Drop Arrangement

Drop arrangement is proposed for the laterals joining the manholes of main sewer where difference between invert levels of two sewers is greater than 600 mm. In the drop section, the pipes and specials shall be of UPVC of class III. Drop pipes to be encased with the PCC to support the pipe.

(c) Scrapper Manhole / Service Manhole

Scrapper manhole / service manhole shall be provided at a spacing of 110-120 m for sewer diameters of 450mm and above. Scrapper or service manhole shall have clear opening of 1200 X 900 to facilitate lowering of the bucket. The internal size of scrapper manholes may be kept as following for varying diameters:

(d) Vent Shaft

To make provision for the escape of air to keep the sewage as fresh as possible in the sewers, it is proposed to provide vent shafts on the sewers of diameter of 300 mm and above. Pre Cast RCC vent shaft of total 9.0 m height, projecting 7.50m above ground, shall be provided at the start of sewers and along sewers at critical junctions.

4.6 Sewage Treatment Plant (STP)

4.6.1 Selection of Sewage Treatment Process

The selection of a particular type of treatment technology will depend upon the techno-economic feasibility of the process selected for treatment. The tech-economic feasibility can be attributed to the following parameters:

- Degree of treatment required
- Capital cost of the project
- Operation & Maintenance cost

- Power Requirement
- Land Requirement
- Ease of construction, Operation & Maintenance
- Simplicity of system
- Trouble free service
- Proven process
- Ability to absorb shock loads (Hydraulic / Organic)
- Need for skilled / unskilled staff O&M
- Presence / absence of nuisance potential from mosquito / fly / odor
- Ease of access to components of the system for repairs and maintenance
- Safety / Hazardous conditions at the plant

4.6.2 Classification of Sewage Treatment Plants

When characteristics of raw wastewater, the intended use and quality of receiving waters and their assimilative capacity are known, extent or degree of treatment needed for the wastewaters (sewage) can be determined. Different types of treatment provide different percentage removal of BOD, suspended solids, and total coli forms the general yardstick for evaluating the performance of sewage treatment plants.


In general, the treatment plants are classified as: Preliminary treatments, Primary treatments, Intermediate treatments, Secondary treatments & Tertiary treatments.


4.6.3 Existing Treatment Technologies

The technologies generally evaluated on the basis of

- I. Performance,
- II. Energy requirement,
- III. Resource requirements and associated costs,
- IV. Land requirements.
- V. Annualized cost has also been worked out.

This compendium is referred for selection of an appropriate sewage treatment technology. It implies that depending on the desired water quality of the effluent of the STP, land requirement, availability of electricity and funds available, the technology that appears feasible is selected.


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Options for locating STPs. The following options have to be generally considered for locating STPs:

- One, with a decentralized approach, which would envisage collection, treatment and disposal of wastewater in the neighborhood itself.
- The second option involves conveying the collected wastewater to a centralized STP from where it could be suitably disposed of into the river or used for irrigation.
- Locating the STP further away where land at lower rates is available and inexpensive technology can be adopted.

(1) Waste Stabilization Ponds

There are three basic types of waste stabilization ponds and these are normally connected in series to provide a two- or three-stage treatment process. They are:

Anaerobic Ponds

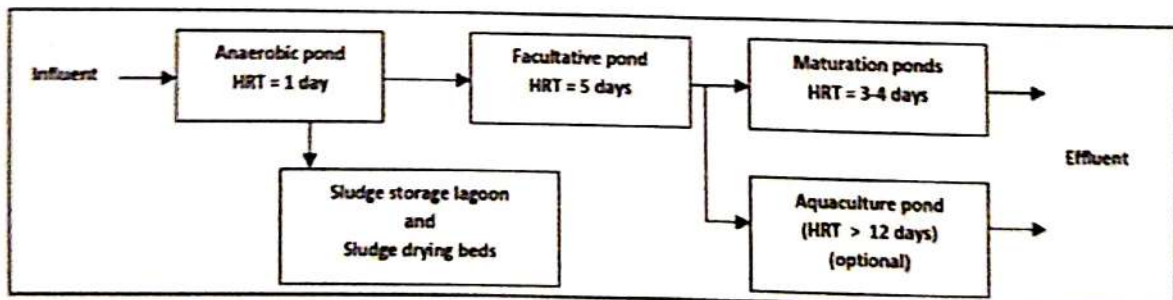
Comparatively small and deep (3–4 m) as there is no need for aeration. They receive raw sewage which is treated by anaerobic bacteria, while sludge that builds up in the bottom of the pond is digested by anaerobic micro-organisms.

Facultative Ponds

Shallower (1.5–2 m) with a larger surface area than anaerobic ponds, they consist of an aerobic zone close to the surface and a deeper, anaerobic zone.

Maturation Ponds

Shallow (1–1.2 m) with a large surface area to enable light penetration. They receive treated effluent from the facultative pond and provide tertiary treatment to remove turbidity, pathogens, and nutrients.



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Waste stabilization ponds are appropriate for medium- to low-density settlements with sufficient free space, but should not be located very close to houses due to possible odor.

- They offer a robust treatment process that can deal with a wide variety of wastewaters of varying types and concentrations.
- Ponds are particularly appropriate where pathogen removal is an important objective of treatment
- Waste stabilization ponds may be combined with aquaculture systems (duckweed, water hyacinth or fish production).

Treatment efficiency of high-loaded ponds with long retention times ranges from 70–95 percent BOD removal (COD removal: 65 percent to 90 percent) depending on biodegradability of the wastewater.

Limitations and Risks

- Ponds require a lot of land, at least 5 m² per person.
- Under design, hydraulic short-circuiting, and poor operation and maintenance can all reduce performance.
- Possible problems related to odor and insects if the ponds are not managed properly, or are overloaded.

Management Arrangements

- Performance and operation and maintenance practices need supervision and monitoring.

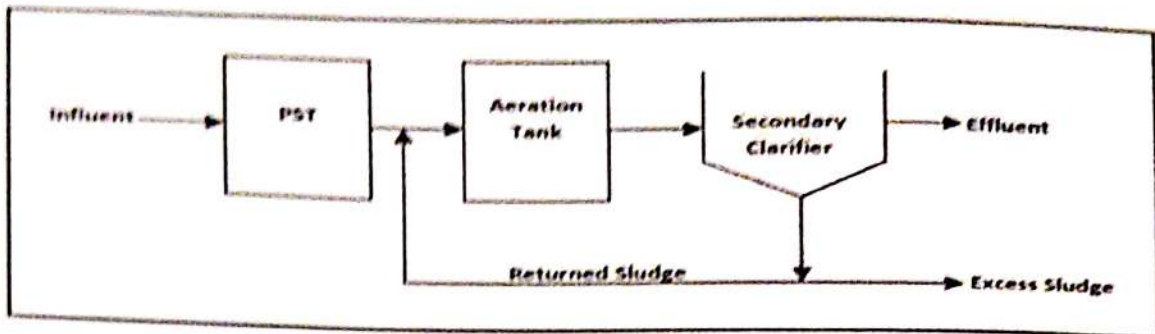
(2) Activated Sludge Process

- This process involves rapid mixing and aeration of the wastewater, either by mechanical surface aerators or a submerged compressed air system, to create optimal conditions for treatment.
- The aeration basin is followed by a secondary clarifier (settling tank) designed to remove suspended micro-organisms (flocs) prior to discharge. Active biomass is returned to the aeration tank.
- Widely used for the treatment of municipal wastewater from medium to large towns where land is scarce and power is reliable.
- A continuous supply of oxygen and sludge is essential; hence maintenance of the aeration equipment and sludge pump is important.

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- Careful monitoring and control of concentrations of suspended sludge solids and dissolved oxygen levels in the aeration tank is required.



Management Arrangements

The activated sludge process is technically complex and requires a highly competent and trained supervisor and workforce to be able to operate the system effectively.

Limitations and Risks

- High energy consumption results in high recurring costs.
- Performance is adversely affected due to interruptions in power supply, even for short periods of time, due to impacts on aeration process and sludge recirculation.
- Foaming, particularly in the winter, may adversely affect the oxygen transfer, and hence performance.
- Mixing of industrial effluent with domestic wastewater can lead to toxicity and major malfunctioning.

(3) Upflow Anaerobic Sludge Blanket (UASB)

Wastewater flows upwards through a blanket of flocculated biomass in a vertical reactor containing anaerobic bacteria which break down carbonaceous organic matter. Best suited to higher strength wastewaters: black water and industrial waste water, but can also treat lower strength domestic wastewater.

Appropriate for medium-size wastewater treatment plants. UASBs need less land than aerobic systems but require follow-up treatment to achieve comparable performance in terms of COD/BOD removal.

Mode Of Operation

- The upward motion of gas bubbles produced during anaerobic digestion causes turbulence that enables mixing without mechanical assistance. Baffles at the top of the reactor allow gases to escape but prevent outflow of the sludge blanket.

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- No external energy requirements in the reactor, thereby the process is not vulnerable to power cuts.
- Can bring down BOD of domestic wastewater to 70-100 mg/l and suspended solids as low as 50-100 mg/l, but removal of nitrogen and bacteria is poor.

Management Arrangements

- Skilled supervision during start-up and for control of biomass levels in the reactor

Limitations And Risks

- Long start-up and high initial oxygen demand of effluent during this period may cause oxygen depletion in receiving water bodies.
- Sensitive to seasonal temperature variations and low removal efficiency in winter.
- Release of corrosive and odorous hydrogen sulfide and ammonia in the air.
- Sludge washout from the reactor can result in instability leading to deteriorations in treatment performance and very high BOD and total suspended solids in the effluent.

(4) Anaerobic Baffled Reactor

- An anaerobic baffled reactor consists of a settling compartment with the same dimensions as the first compartment of a conventional septic tank, followed by a number of smaller compartments arranged in series.
- After passing through the first compartment, sewage passes from bottom to top through the remaining compartments in turn. Intensive contact between resident sludge and incoming liquid increases treatment efficiency.
- The baffled reactor tank is suitable for all kind of wastewaters (including domestic) but its efficiency increases with higher organic loadings and is therefore most appropriate for the treatment of black water.
- Suitable for small community schemes and housing developments with no access to municipal sewerage.

Limitations and Risks


- Operation and maintenance is easily ignored, leading to deterioration in performance.


Management Arrangements

- The system is fairly robust and relatively easy to operate but nevertheless requires organized technical management.

(5) Sequential Batch Reactor (SBR)

It is a fill and draw batch aerobic suspended growth (Activated Sludge) process incorporating all the features of extended aeration plant. After screening and de-gritting,

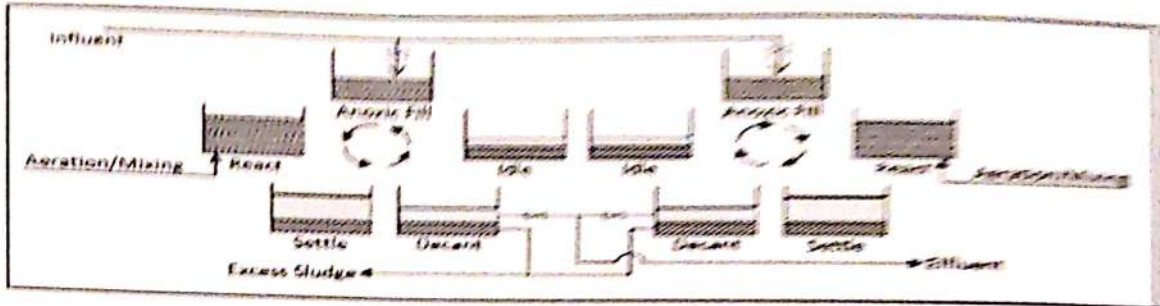

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sewage is fed to the batch reactor. Reactor operations (fill, react, settle, decant) are carried out in cyclic order and in each cycle, following operations are involved.

- Anoxic Filling tank
- Aeration
- Sedimentation/clarification
- Decantation
- Sludge withdrawal



S. No	Item Description	ASP	WSP	SER
1	Hydraulic detention time	3-8 hrs	10-12 days (Anaerobic + Facultative + Maturation)	7-12 hrs
2	Land requirement (Hect./MLD)	0.20 - 0.40	2.00	0.06
3	Stability against shock load	Susceptible during excessive variation	Stable	Stable
4	Operating Cost/KL(Rs.)	3.50	1.00	5.00
5	Operating comparison Cost	Moderate	low	high
6	Installation comparison Cost	Substantially high	low	high
7	Simple O&M	Skilled O&M required	Simple	Skilled O&M required
8	BOD ₅ removed efficiency (%)	85 - 92	75-80	95-98
9	Digestion Sludge	Required inviting considerable skill	Manual de-sludging once in 5-10 yrs	Not required
10	Odor problem	Slight	Odour problem in anaerobic pond	No Odour
11	Cost/MldRs in Lakhs	80-120	16	110-150

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4.7 Description of Wastewater Treatment Plant (STP)

Sequential Batch Reactor (SBR)

The sequencing batch reactor (SBR) is a fill-and-draw activated sludge system for wastewater treatment. In this system, wastewater is added to a single "batch" reactor, treated to remove undesirable components, and then discharged. Equalization, aeration, and clarification can all be achieved using a single batch reactor. To optimize the performance of the system, two or more batch reactors are used in a predetermined sequence of operations. SBR systems have been successfully used to treat both municipal and industrial wastewater.


Operation under SBR Process

Influent wastewater generally passes through screens and grit removal prior to the SBR. The wastewater then enters a partially filled reactor, containing biomass, which is acclimated to the wastewater constituents during preceding cycles. Once the reactor is full, it behaves like a conventional activated sludge system, but without a continuous influent or effluent flow. The aeration and mixing is discontinued after the biological reactions are complete, the biomass settles, and the treated supernatant is removed. Excess biomass is wasted at any time during the cycle. Frequent wasting results in holding the mass ratio of influent substrate to biomass nearly constant from cycle to cycle. Continuous flow systems hold the mass ratio of influent substrate to biomass constant by adjusting return activated sludge flow rates continually as influent flow rates, characteristics, and settling tank underflow concentrations vary. After the SBR, the "batch" of wastewater may flow to an equalization basin where the wastewater flow rate to additional unit processed can be controlled at a determined rate.

Performance of SBR

The performance of SBRs is typically comparable to conventional activated sludge systems and depends on system design and site specific criteria. Depending on their mode of operation, SBRs can achieve good BOD and nutrient removal. For SBRs, the BOD removal efficiency is generally 85 to 95 percent.


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SBR manufacturers will typically provide a process guarantee to produce an effluent of less than:

- 10 mg/L BOD
- 10 mg/L TSS
- 5 – 8 mg/L TN
- 1 – 2 mg/L TP

COMPONENTS USED IN SBR STILLING CHAMBER

1. The stilling chamber. Stilling Chamber is a small chamber used with a pumped effluent system and is designed to slow the flow of effluent from the septic tank. Function of stilling chamber is to reduce Turbulence in the incoming flow HRT: 45 sec
2. Fine Screen Chamber.
Fine screens are typically used to remove material that may create operation and maintenance problems in downstream processes, particularly in system that lack primary treatment. Typical opening sizes for fine screens are 1.5 to 6mm (0.06 to 0.25 in). Very Fine screens with openings of 0.2 to 1.5 mm (0.01 to 0.06 in) place after coarse or fine screens can reduce suspended solids to levels near those achieved by primary clarification.
3. Screen Dimension:
Bar Thickness: 3mm
Clear Opening between bars: 6mm
Angle of Inclination of Bar: 45 Degree
4. Grit Chamber
Grit chambers are basin to remove the inorganic particles to prevent damage to the pumps, and to prevent their accumulation in sludge digesters.
Surface Overflow Rate: 1555 m³/m²/day
HRT: 60 sec
5. Basin
Aeration Blowers are started for a pre-determined time to aerate the effluent along with the biomass. After the aeration cycle, the biomass settles under perfect settling conditions. Once settled, the supernatant is removed from the top using a DECANTER. Solids are wasted from the tanks during the decanting phase. F/M ratio: 0.117.


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6. Selector Anoxic Zone

The concept of a selector is a small tank or zone at the front end of the aeration basin where influent wastewater and return activated sludge mix prior to entering the main aeration basin. It is called a selector because it is supposed to be anoxic and select for desirable, nonfilamentous, bacteria. HRT: 30 minutes

7. Air Blower & Diffuser

Air blower is operated continuously and stand in dry, well-ventilated place, away from residential premises.

O₂ required as per Sewage Manual: 1.200 kg/kg BOD

8. Chlorination Tank

The purpose of chlorination may not always be disinfection and may, in fact, involve odour control or some other objective which will be noted. Proper mixing of incoming effluent with chlorine will be done by providing horizontal or vertical baffle walls or by using a diffuser system in the chlorination tank. HRT: 10 minutes

9. Chlorinator

It regulates flow of chlorine from chlorine cylinders and mixes it with water to produce a solution of chlorine which can then be dosed into the chlorination tank.

Chlorine Dosage Rate: 2 ppm

10. Sludge Sump

Sludge settled in main basin is transferred either by gravity or pumping to the sludge sump where it is kept in suspension by providing air blowers. The sludge is then fed to centrifuge for further dewatering. HRT: 4 hours

Sludge Sump Air blower: The sludge is kept in suspension using air blower, otherwise settling of heavy particles takes place and this may cause block in the pump which pumps sludge to the centrifuge. Air Agitation requirement in Sludge Sump: 1 m³/hr/m³

11. Centrifuge


Centrifuge is used for sludge thickening. While prior sludge have the concentration around 0.51 % of dry solid, after the thickening process, it will contain up to 5-6% of dry solids.

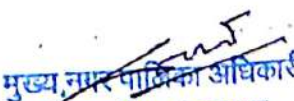
12. DWPE Dosing System

Function: It adds dewatering Polymer to the sludge prior to being sent to the centrifuge for sludge thickening.

DWPE required: 1.2 Kg/MT of Dry Sludge HRT: 12 hours

13. Filtrate Sump


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Function: The cent rate water from centrifuge will be transferred to the filtrate sump. HRT: 30 minutes.

Advantages of SBR


- Simple, Flexible and Efficient
- Smaller foot print by eliminating Sedimentation Tanks
- Saves Power due to variable head in tank and OUR control
- Withstands organic and hydraulic shock loads
- Variable design provides consistent treated effluent quality
- Biological Nutrient (N&P) removal by In-built anoxic zone (selector)
- Excellent treated water quality for reuse of water for horticulture, gardening, etc.
- Completely odour free plants
- Modular design - Easy to Augment


Methodology addressing the engineering parameters: Efficient treatment cost:

- Highly efficient and proven technology in India
- Energy efficient devices
- Air requirement is optimized throughout.
- Plant is automatic with PLC based SCADA operation. Hence, minimum manpower.
- Under water parts are in SS, which ensures longer life, lowers wear & tear and results in low equipment maintenance
- SBR technology gives excellent treated sewage quality which reduces chemical consumption i.e. chlorine and poly.
- Built in nutrient removal system, hence no need to go for separate nutrient removal system. Other equipment makes are A class reputed makes which ensures quality and longer life of plant
- Efficient management of odour:
- Aerobic process
- Bio-sludge is fully stabilized in SBR basin itself. Hence bio-sludge is odour free.
- No primary untreated sludge generation, which causes odour.

Operations during lower loading rates or variable loads:

- SBR is true batch reactor can handle load variations effectively.
- Water levels and air supplies are adjusted automatically based on actual flow and organic load
- SBR basin acts like equalization tank and discharge water at uniform rate even though the feed is variable.
- During less inlet flow, the batch treatment turns down to lowest to save energy.


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Efficient utilization of land:

- SBR has compact process design and requires almost 50% less area compare to conventional treatment technologies due to absence of primary & secondary clarifiers, sludge digesters, gas holders, etc.
- Modular design
- Besides, during engineering units will be clubbed together to save land requirement
- SBR has compact process design and requires almost 50% less area compare to conventional treatment technologies due to absence of primary & secondary clarifiers, sludge digesters, gas holders, etc.
- Modular design
- Besides, during engineering units will be clubbed together to save land requirement
- Efficient energy requirement
- VFD is installed for air blower operations
- Air requirement is optimized through OUR control. Feedback will be taken (through PLC/SCADA) from DO meter installed in SBR basins and fed to VFD, which makes the blowers to run efficiently.
- Complete plant operations are controlled and optimized through PLC/SCADA.

Efficient sludge management:

- There is no primary clarifier required in SBR plant, hence no primary untreated sludge
- Bio-sludge generated from the plant is fully stabilized and digested in SBR basin itself. This sludge is completely chemical free, odorless and can be used as soil conditioner.
- Bio-sludge is mechanically dewatered to reduce the quantum to make it tuckable, in case disposal is required.


Easy operations:

- Less number of units as compare to conventional treatment, hence less number of operations. Plant is automatic and controlled by PLC-SCADA based operations.
- Doses not require any special manpower to operate the plant. Minimum manpower required for operation due to automation.
- Plant operating process variables can be changed according to the plant load. Hence, less manual intervention.

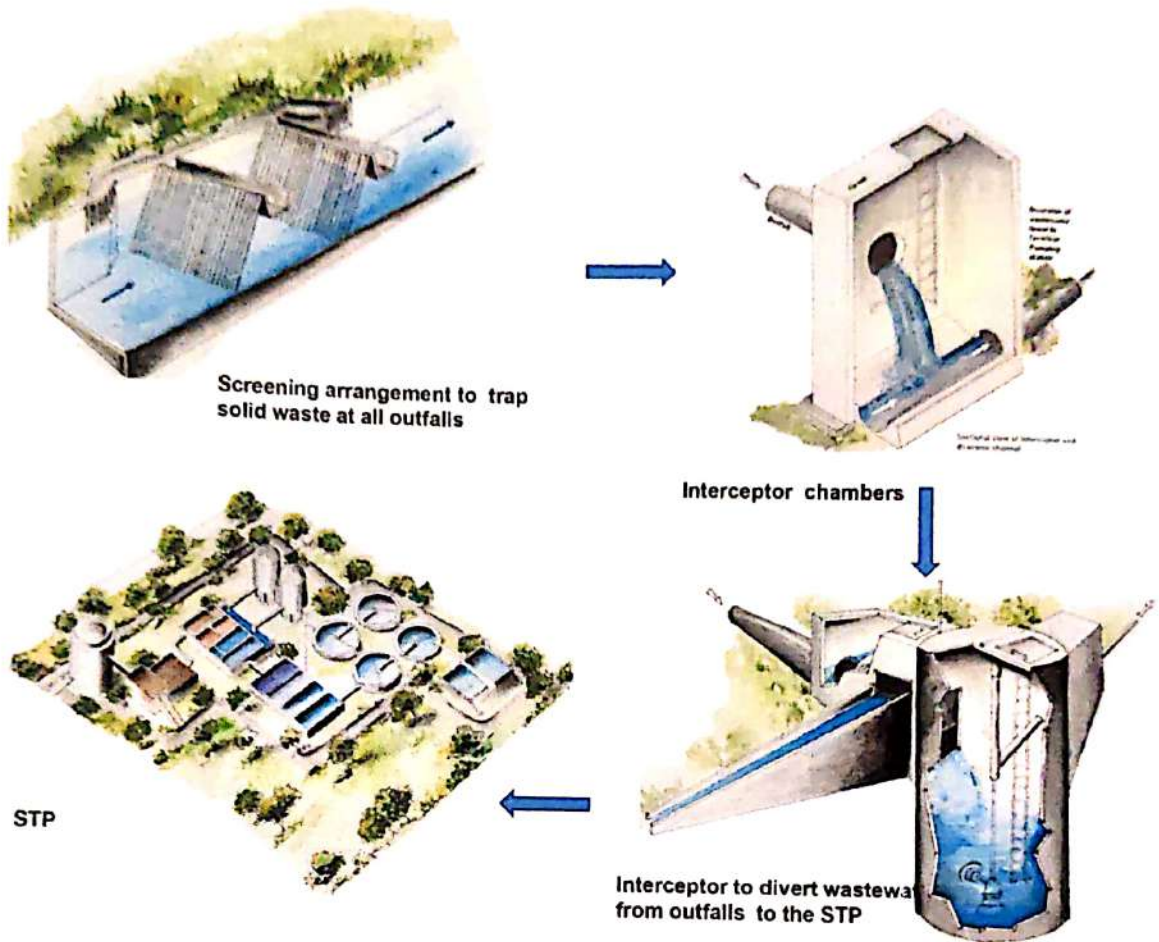
Recycling & reuse

The proposed SBR based plant gives excellent outlet, which can be reused for non-potable purpose such as agriculture, washing, flushing and industrial use.


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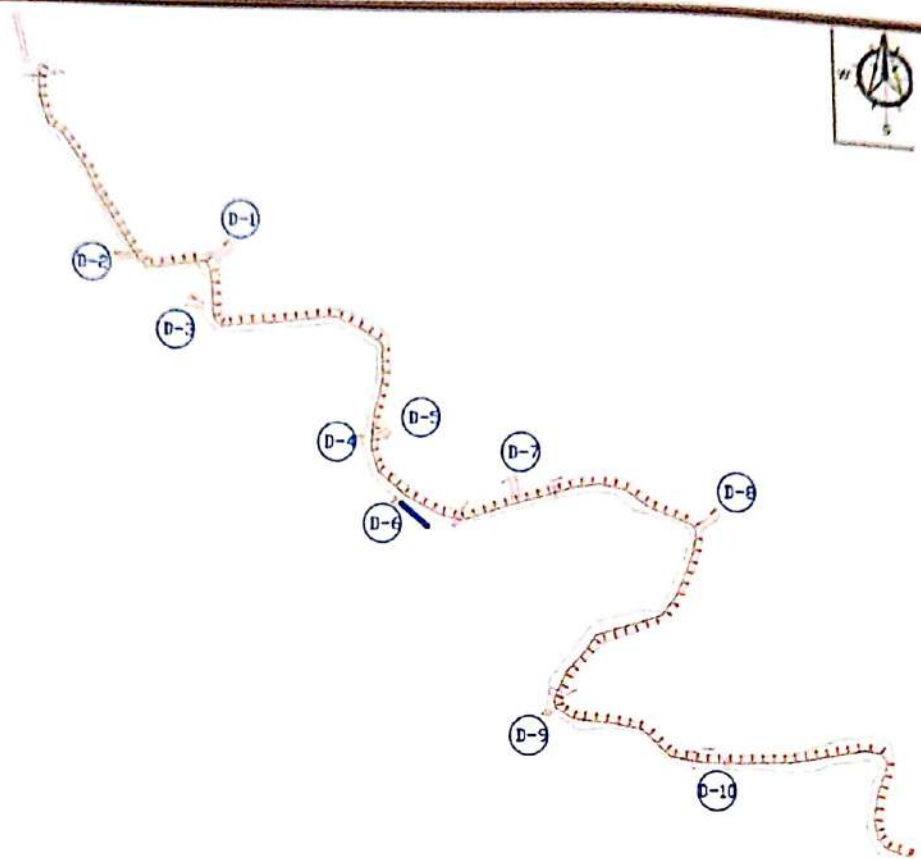

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Chapter 5 - Recommendation for River Rejuvenation

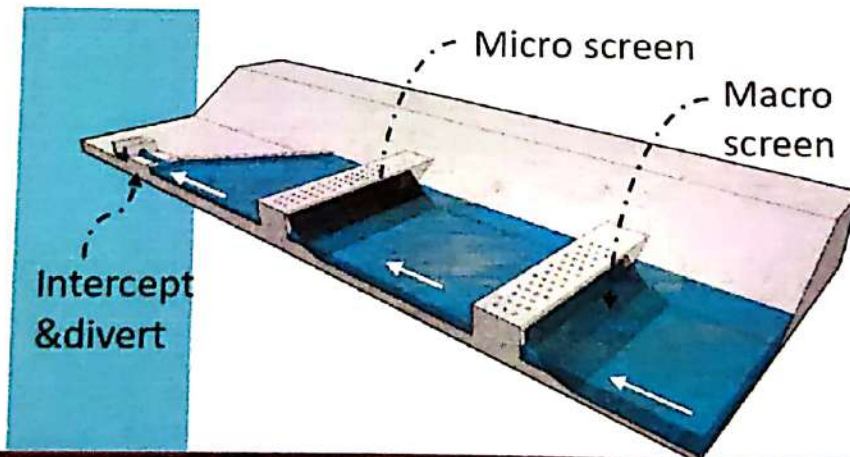


5.1 Interception of Sewer Drains

Based on the survey 10 Drains are identified from where Waste water is getting into River Balwanti.



In order to Prevent Waste Water from draining into River Interception of Drains is Proposed. Waste water will be passes through Screens in order to prevent any Solid Waste content entering into the sewer line. The Screens are manually cleaned on regular interval of time.



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5.2 RCC chamber connecting Nalla to Sewer Line

Rectangular RCC chambers are provided in order to collect Waste water from Nalla and to divert it into Sewer line.

Rectangular Chamber of Size 2.8m x 2.8m x 2.0m are provided at each Drain,

5.3 Sewer Line (Trunk Main)

Waste water from open drains will be diverted via Sewer line (Trunk Main) to the Proposed STP. Considering the design parameters and Flow Sewer line of Diameter ranging from 700mm to 1000mm are proposed on both the side of Bank.

5.4 Sewage Treatment Plant (STP)

Based on the Waste water generation a STP is proposed of Capacity 3.0 MLD at the downstream of River Balwanti. The STP will treat the Waste water intercepted from Drains.

5.5 Earth Retaining Wall

In order to strengthen the bank of River Balwanti, around 200m of stretch is identified on both the bank of River where retaining wall will be constructed.

5.6 Water retaining Structure


An Stop Dam will be constructed on the downstream of STP which will retain the treated water of STP in the river and keep a adequate water level in the River.


Chapter 6 - Estimation and Costing

Based on the ISSR of Department of Urban Administration & Development, Government of Madhya Pradesh in force from - 2nd August 2021 - (VOLUME I, II and III) detailed cost for the project is estimated.

Abstract of Cost of Works Project		
S.No.	Particular	Total Amount (Lakhs)
1	Stop Dam (Length 20 m X 15 Width X 4.5 m Depth)	98.59
2	Interception & Diversion (Tapping Nalla's): Including Preparation of Bed, Installing Screens, RCC Chambers etc. Complete.	52.39
3	Providing and Laying non-pressure (NP3) RCC socket & spigot pipes with rubber gasket joint including testing of joints Diameter from 700 mm to 1000 mm.	491.0
4	Construction Supply, Installation Testing and Commissioning of Civil, Mechanical, Electrical Works of Sewage Treatment Plant of 3.0 MLD based on suitable technology.	410.00
5	Retaining Wall of Total Length 200 meters	59.02
6	Project Cost	1111.00
7	GST @ 18%	200.00
Project Cost with GST (A)		1311.00
8	O & M Cost @ 5 Year (B)	146.73
Total Project Cost in Lakh (A+B)		1457.73
Total Project Cost in Cr (A+B)		14.58





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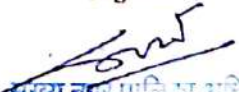
Financial Structure of Project		
Total Project Cost In Lakh		1457.73
1	Fund Available with ULB as sanctioned under CM Infra Scheme	770.00
2	Fund Available with ULB from previous tender under scheme	53.36
3	Fund to be sanction under SBM 2.0 for Liquid Waste Management (Central and State Share)	529.20
Total Fund Available		1352.56
4	Balance fund will be from "Vishesh Nidhi" or other source (in Lakh)	105.17

6.1 Operation and Maintenance

ANNUAL MAINTENANCE ESTIMATE OF STP @ 3.0 MLD					
Sr. No.	Description of Item (Condensed)	Quantity	Unit	Unit Rate	Amount
Sub Head -1 (staff)					
1	Plant Manager	1	No	15,000	180000
2	Chemist	1	No	12,000	144000
3	Fitter / Mechanic I Class	1	No	10,000	120000
4	Electrician- I Class	1	No	10,000	120000
5	Operator	1	No	9,000	108000
6	Sewerman + Labour	1	No	9,000	108000
7	Mali cum Chowkidar	2	No	8,500	204000
Subtotal					9,84,000
Sub Total (1)					9,84,000
Sub Head -2 (Chemical)					
1	Dewatering Polymer (per Day) @ 0.13kg /mld per day	105	Kg	250	26325
2	Chlorination Gas at 3 ppm per MLD	2,430	Kg	18	43740
Subtotal					70,065
Subtotal (2)					70,065
Sub Head -3 (Repair of Civil , E & M Items)					
1	Civil, Mechanical, Electrical and Instrumentation @ 1 % of capital cost	131021293	Rs	0.01	1310213
Subtotal					13,10,213
Subtotal (3)					13,10,213
Grand Total of Sub head No. 1+2+3					23,64,278


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COST OF ANNUAL MAINTENANCE FOR 5 YEARS				
S.No.	Operational and Maintenance Costs	Subhead-1 Manpower Cost	Subhead-2 Chemical	Subhead-3 Maintenance cost for Civil, Mechanical, Electrical and Instrumentation component.
1	1st year	₹ 9,84,000.00	₹ 70,065.00	₹ 13,10,212.93
2	2nd year	₹ 10,33,200.00	₹ 71,466.30	₹ 14,41,234.23
3	3rd year	₹ 10,84,860.00	₹ 72,895.63	₹ 16,14,182.33
4	4th year	₹ 11,39,103.00	₹ 74,353.54	₹ 20,01,586.09
5	5th year	₹ 11,96,058.15	₹ 75,840.61	₹ 25,03,984.20
	Total Cost	₹ 54,37,221.15	₹ 3,64,621.07	₹ 88,71,199.79
	Total Cost 5 Year	₹ 1,46,73,042.02		
	Total Cost 5 Year (Cr)	₹ 146.73		

Annexures

Annexure I – Hydraulic Design Details


Annexure II (A) – Contour Map of River Balwanti


Annexure II (B) – Detail BOQ of Capital Cost for Processing & Disposal

Annexure III – Drawings

Annexure IV – Testing Reports






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INTERCEPTION & DIVERSION OUTPUT RESULT

Label	Start Node	Stop Node	Elevation Ground (Start) (m)	Elevation Ground (Stop) (m)	Invert (Start) (m)	Invert (Stop) (m)	Length (Scaled) (m)	Slope (Calculated) (1/S)	Diameter (mm)	Material	Depth of Sewer (Start) Manhole	Depth of Sewer (Stop) Manhole	Depth of Sewer (Average)	Cushion (Start) Manhole	Cushion (Stop) Manhole	Cushion (Average)
CO.1	L-CM-06	MH.70	485.85	485.22	484.18	484.11	16.9	250.00	200	RCC-NP-3	1.67	1.11	1.39	1.87	1.31	1.59
CO.2	MH.1	MH.2	493.16	493.61	492.05	492.01	28.7	650.00	700	RCC-NP-3	1.11	1.6	1.355	1.81	2.3	2.055
CO.3	MH.2	MH.3	493.61	493.02	491.52	491.41	27.5	250.00	700	RCC-NP-3	2.09	1.61	1.85	2.79	2.31	2.55
CO.4	MH.3	MH.206	493.02	495.24	491.41	491.37	29.5	650.00	700	RCC-NP-3	1.61	3.87	2.74	2.31	4.57	3.44
CO.5	MH.206	MH.4	495.24	497.4	491.37	491.32	30.5	650.00	700	RCC-NP-3	3.87	6.08	4.975	4.57	6.78	5.675
CO.6	MH.4	MH.5	497.4	494.32	491.32	491.28	28.4	650.00	700	RCC-NP-3	6.08	3.04	4.56	6.78	3.74	5.25
CO.7	MH.5	MH.6	494.32	493.44	491.28	491.24	20.3	650.00	700	RCC-NP-3	3.04	2.2	2.62	3.74	2.9	3.32
CO.8	MH.6	MH.7	493.44	493.61	491.24	491.21	22.9	650.00	700	RCC-NP-3	2.2	2.4	2.3	2.9	3.1	3
CO.9	MH.7	MH.8	493.61	494.55	491.21	491.16	29.6	650.00	700	RCC-NP-3	2.4	3.39	2.895	3.1	4.09	3.595
CO.10	MH.8	MH.9	494.55	494.23	491.16	491.11	33.8	650.00	700	RCC-NP-3	3.39	3.12	3.255	4.09	3.82	3.955
CO.11	MH.9	MH.10	494.23	493.39	491.11	491.06	35.5	650.00	700	RCC-NP-3	3.12	2.33	2.725	3.82	3.03	3.425
CO.12	MH.10	MH.11	493.39	494.41	491.06	491.01	33.3	650.00	700	RCC-NP-3	3.12	3.4	2.865	3.03	4.1	3.565
CO.13	MH.11	MH.12	494.41	493.35	491.01	490.95	33.9	650.00	700	RCC-NP-3	3.4	2.4	2.9	4.1	3.1	3.6
CO.14	MH.12	MH.13	493.35	493.1	490.95	490.9	34.1	650.00	700	RCC-NP-3	2.4	2.2	2.3	3.1	2.9	3
CO.15	MH.13	MH.14	493.1	494.45	490.9	490.86	29.9	650.00	700	RCC-NP-3	2.2	3.59	2.895	2.9	4.29	3.595
CO.16	MH.14	MH.15	494.45	492.44	490.86	490.81	29.8	650.00	700	RCC-NP-3	3.59	1.63	2.61	4.29	2.33	3.31
CO.17	MH.15	MH.210	492.44	492.7	490.81	490.77	29.3	650.00	700	RCC-NP-3	1.63	1.93	1.78	2.33	2.63	2.48
CO.18	MH.210	MH.16	492.7	492.98	490.77	490.72	32.4	650.00	700	RCC-NP-3	1.93	2.26	2.095	2.63	2.96	2.795
CO.19	MH.16	MH.211	492.98	492.43	490.72	490.68	25.8	650.00	700	RCC-NP-3	2.26	1.75	2.005	2.96	2.45	2.705
CO.20	MH.211	MH.17	492.43	491.93	490.68	490.62	23.8	250.00	700	RCC-NP-3	2.01	1.61	1.81	2.71	2.31	2.51
CO.21	MH.17	MH.18	491.93	490.54	489.07	488.93	34.8	250.00	700	RCC-NP-3	2.86	1.61	2.235	3.56	2.31	2.935
CO.22	MH.18	MH.19	490.54	490.91	488.93	488.89	29	650.00	700	RCC-NP-3	1.61	2.02	1.815	2.31	2.72	2.515
CO.23	MH.19	MH.209	490.91	491.01	488.89	488.85	25	650	700	RCC-NP-3	2.02	2.16	2.09	2.72	2.86	2.79
CO.24	MH.209	MH.20	491.01	491.13	488.85	488.8	27.7	650	700	RCC-NP-3	2.16	2.33	2.245	2.86	3.03	2.945
CO.25	MH.20	MH.208	491.13	491.43	488.8	488.76	28.3	650	700	RCC-NP-3	2.33	2.67	2.5	3.03	3.37	3.2
CO.26	MH.208	MH.21	491.43	491.76	488.76	488.71	30.2	650	700	RCC-NP-3	2.67	3.05	2.86	3.37	3.75	3.58
CO.27	MH.21	MH.207	491.76	491.65	488.71	488.66	33.3	650	700	RCC-NP-3	3.05	2.99	3.02	3.75	3.69	3.72
CO.28	MH.207	MH.22	491.65	491.54	488.66	488.72	29.2	-331.153	700	RCC-NP-3	2.99	2.82	2.905	3.69	3.52	3.685
CO.29	L-CM-01	MH.22	491.6	491.54	490.47	490.43	9.5	250	200	RCC-NP-3	1.13	1.11	1.12	1.33	1.31	1.32
CO.30	MH.22	MH.225	491.54	491.6	488.62	488.55	26.7	405.63	800	RCC-NP-3	2.92	3.05	2.985	3.72	3.85	3.785
CO.31	MH.225	MH.23	491.6	491.67	488.55	488.48	27.8	385.737	800	RCC-NP-3	3.05	3.19	3.12	3.85	3.98	3.92


 नगर परिषद, बटनावर
 जिला धार (म.प्र.)


 नगर परिषद बटनावर
 जिला धार (म.प्र.)

INTERCEPTION & DIVERSION OUTPUT RESULT

Label	Start Node	Stop Node	Elevation Ground (Start) (m)	Elevation Ground (Stop) (m)	Invert (Start) (m)	Invert (Stop) (m)	Length (Scaled) (m)	Slope (Calculated) (1/S)	Diameter (mm)	Material	Depth of Sewer (Start) Manhole	Depth of Sewer (Stop) Manhole	Depth of Sewer (Average)	Combion (Start) Manhole	Combion (Stop) Manhole	Combion (Average)
CO:32	MH:23	MH:24	491.67	491.54	488.48	488.41	27.5	385.737	800	RCC-NP-3	3.19	3.13	3.16	3.95	3.93	3.96
CO:33	MH:24	MH:26	491.54	491.4	488.41	488.33	30.2	385.737	800	RCC-NP-3	3.13	3.07	3.1	3.93	3.87	3.9
CO:34	MH:26	MH:25	491.4	491.25	488.33	488.22	31	289.368	800	RCC-NP-3	3.07	3.03	3.05	3.87	3.83	3.84
CO:35	MH:25	MH:26	491.25	489.78	488.22	488.07	37.8	250	800	RCC-NP-3	3.03	1.71	2.37	3.83	2.51	3.17
CO:36	MH:26	MH:27	489.78	489.85	488.07	487.97	40.3	385.737	800	RCC-NP-3	1.71	1.88	1.795	2.51	2.68	2.595
CO:37	MH:27	MH:28	489.85	490.09	487.97	487.84	47.4	385.74	800	RCC-NP-3	1.88	2.25	2.065	2.68	3.05	2.865
CO:38	MH:28	MH:29	490.09	491.01	487.84	487.76	32.2	385.74	800	RCC-NP-3	2.25	3.25	2.75	3.05	4.05	3.55
CO:39	MH:29	MH:30	491.01	491.76	487.76	487.68	29.7	385.74	800	RCC-NP-3	3.25	4.08	3.665	4.05	4.88	4.465
CO:40	MH:30	MH:31	491.76	492.33	487.68	487.59	35.7	385.74	800	RCC-NP-3	4.08	4.74	4.41	4.88	5.54	5.21
CO:41	MH:31	MH:32	492.33	491.47	487.59	487.5	34.1	385.74	800	RCC-NP-3	4.74	3.97	4.355	5.54	4.77	5.155
CO:42	MH:32	MH:33	491.47	490.52	487.5	487.44	24.9	385.74	800	RCC-NP-3	3.97	3.08	3.525	4.77	3.88	4.325
CO:43	MH:33	MH:34	490.52	489.74	487.44	487.37	27.8	385.74	800	RCC-NP-3	3.08	2.57	2.725	3.88	3.17	3.525
CO:44	MH:34	MH:35	489.74	490.69	487.37	487.33	13.3	385.74	800	RCC-NP-3	2.57	3.36	2.865	3.17	4.16	3.865
CO:45	MH:35	MH:36	490.69	489.85	487.33	487.23	37.5	385.74	800	RCC-NP-3	3.36	2.62	2.99	4.16	3.42	3.79
CO:46	MH:36	MH:37	489.85	491.68	487.23	487.14	35.9	385.74	800	RCC-NP-3	2.62	4.54	3.58	3.42	5.34	4.38
CO:47	MH:37	MH:38	491.68	491.06	487.14	487.08	24.4	385.74	800	RCC-NP-3	4.54	3.98	4.26	5.34	4.78	5.06
CO:48	MH:38	MH:39	491.06	490.32	487.08	487.01	26.6	385.74	800	RCC-NP-3	3.98	3.31	3.645	4.78	4.11	4.445
CO:49	MH:39	MH:40	490.32	490.32	487.01	486.97	16.1	385.74	800	RCC-NP-3	3.31	3.35	3.33	4.11	4.15	4.13
CO:50	MH:40	MH:41	490.32	490.39	486.97	486.89	28.3	385.74	800	RCC-NP-3	3.35	3.5	3.425	4.15	4.3	4.225
CO:51	MH:41	MH:42	490.39	490.82	486.89	486.83	24.5	385.74	800	RCC-NP-3	3.5	3.99	3.745	4.3	4.78	4.54
CO:52	MH:42	MH:224	490.82	491.3	486.83	486.76	26.8	385.74	800	RCC-NP-3	3.99	4.54	4.265	4.78	5.34	5.065
CO:53	MH:224	MH:43	491.3	491.8	486.76	486.69	27.4	385.74	800	RCC-NP-3	4.54	5.11	4.825	5.34	5.91	5.625
CO:54	MH:43	MH:223	491.8	491.12	486.69	486.61	29.2	385.74	800	RCC-NP-3	5.11	4.51	4.81	5.91	5.31	5.61
CO:55	MH:223	MH:222	491.12	490.34	486.61	486.53	34.2	385.74	800	RCC-NP-3	4.51	3.81	4.16	5.31	4.61	4.99
CO:56	MH:222	MH:44	490.34	489.6	486.53	486.44	32.1	385.74	800	RCC-NP-3	3.81	3.16	3.485	4.61	3.86	4.285
CO:57	MH:44	MH:45	489.6	489.62	486.44	486.37	29	385.74	800	RCC-NP-3	3.16	3.25	3.205	3.86	4.05	4.085
CO:58	MH:45	MH:212	489.62	488.7	486.37	486.29	30.5	385.74	800	RCC-NP-3	3.25	2.41	2.83	4.05	3.21	3.63
CO:59	MH:212	MH:46	488.7	487.76	486.29	486.18	31.9	230.00	800	RCC-NP-3	2.52	1.71	2.115	3.21	2.81	2.885
CO:60	I-CM-02	MH:46	487.92	487.76	486.18	486.05	8.3	230.00	200	RCC-NP-3	1.23	1.11	1.17	1.43	1.33	1.37
CO:61	MH:46	MH:47	487.76	488.55	486.05	485.98	43.2	600.75	800	RCC-NP-3	1.71	2.57	2.14	2.91	3.37	3.24
CO:62	MH:47	MH:213	488.55	487.35	485.98	485.64	37.3	230.00	800	RCC-NP-3	2.76	1.71	2.238	3.86	2.81	3.038

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INTERCEPTION & DIVERSION OUTPUT RESULT

Label	Start Node	Stop Node	Elevation Ground (Start) (m)	Elevation Ground (Stop) (m)	Invert (Start) (m)	Invert (Stop) (m)	Length (Scaled) (m)	Slope (Calculated) (1/S)	Diameter (mm)	Material	Depth of Sewer (Start) Manhole	Depth of Sewer (Stop) Manhole	Depth of Sewer (Average)	Cushion (Start) Manhole	Cushion (Stop) Manhole	Cushion (Average)
CO-63	MH-213	MH-48	487.35	486.18	484.61	484.64	36.5	-1.347.84	800	RCC-NP-3	2.71	1.54	2.14	3.54	2.34	2.04
CO-64	L-CM-03	MH-48	486.35	486.18	485.14	485.24	18.7	-189.86	200	RCC-NP-3	1.21	0.94	1.075	1.41	1.14	1.275
CO-65	MH-48	MH-49	486.18	488.31	484.54	484.48	37.6	650.00	900	RCC-NP-3	1.64	3.83	2.735	2.54	4.73	3.635
CO-66	MH-49	MH-50	488.31	488.12	484.48	484.45	23.7	650.00	900	RCC-NP-3	3.83	3.67	3.75	4.73	4.57	4.65
CO-67	MH-50	MH-214	488.12	487.12	484.45	484.4	32.1	650.00	900	RCC-NP-3	3.67	2.72	3.195	4.57	3.62	4.095
CO-68	MH-214	MH-51	487.12	486.09	484.4	484.28	31	255.61	900	RCC-NP-3	2.72	1.81	2.265	3.62	2.71	3.165
CO-69	L-CM-04	MH-51	486.13	486.09	485.02	484.98	11.7	307.01	200	RCC-NP-3	1.11	1.11	1.11	1.31	1.31	1.31
CO-70	MH-51	MH-216	486.09	486.23	484.28	484.23	31.6	650.00	900	RCC-NP-3	1.81	2	1.905	2.71	2.9	2.805
CO-71	MH-216	MH-52	486.23	486.37	484.23	484.18	30.6	650.00	900	RCC-NP-3	2	2.19	2.095	2.9	3.09	2.995
CO-72	MH-52	MH-53	486.37	486.82	484.18	484.14	29.6	650.00	900	RCC-NP-3	2.19	2.68	2.435	3.09	3.58	3.135
CO-73	MH-53	MH-54	486.82	486.98	484.14	484.09	28.4	650.00	900	RCC-NP-3	2.68	2.89	2.785	3.58	3.79	3.685
CO-74	MH-54	MH-215	486.98	486.75	484.09	484.05	24.2	650.00	900	RCC-NP-3	2.89	2.7	2.795	3.79	3.6	3.695
CO-75	MH-215	MH-55	486.75	486.52	484.05	484.01	28.1	650.00	900	RCC-NP-3	2.7	2.51	2.605	3.6	3.41	3.505
CO-76	MH-55	MH-217	486.52	487.04	484.01	483.96	30.8	650.00	900	RCC-NP-3	2.51	3.08	2.795	3.41	3.98	3.695
CO-77	MH-217	MH-56	487.04	487.61	483.96	483.91	33	650.00	900	RCC-NP-3	3.08	3.7	3.39	3.98	4.6	4.29
CO-78	MH-56	MH-57	487.61	487.08	483.91	483.87	30.5	650.00	900	RCC-NP-3	3.7	3.21	3.455	4.6	4.11	4.355
CO-79	MH-57	MH-218	487.08	486.6	483.87	483.81	33.8	650.00	900	RCC-NP-3	3.21	2.79	3	4.11	3.69	3.9
CO-80	MH-218	MH-58	486.6	486.07	483.81	483.76	36.4	650.00	900	RCC-NP-3	2.79	2.31	2.55	3.69	3.21	3.45
CO-81	MH-58	MH-219	486.07	486.1	483.76	483.7	36.2	650.00	900	RCC-NP-3	2.31	2.4	2.355	3.21	3.3	3.255
CO-82	MH-219	MH-59	486.1	486.13	483.7	483.64	38.7	650.00	900	RCC-NP-3	2.4	2.49	2.445	3.3	3.39	3.345
CO-83	MH-59	MH-60	486.13	485.82	483.64	483.59	34.5	650.00	900	RCC-NP-3	2.49	2.23	2.36	3.39	3.13	3.29
CO-84	MH-60	MH-61	485.82	486.31	483.59	483.54	30.9	650.00	900	RCC-NP-3	2.23	2.77	2.5	3.13	3.67	3.4
CO-85	MH-61	MH-62	486.31	486.09	483.54	483.49	31	650.00	900	RCC-NP-3	2.77	2.6	2.685	3.67	3.5	3.585
CO-86	MH-62	MH-63	486.09	486.3	483.49	483.46	22.1	650.00	900	RCC-NP-3	2.6	2.84	2.72	3.5	3.74	3.62
CO-87	L-CM-05	MH-63	487.37	486.3	485.28	485.19	22.5	250.00	200	RCC-NP-3	2.09	1.11	1.6	2.29	1.31	1.8
CO-88	MH-63	MH-64	486.3	484.54	482.93	482.73	50.1	250.00	900	RCC-NP-3	3.37	1.81	2.39	4.27	2.71	3.49
CO-89	MH-64	MH-65	484.54	485.18	482.73	482.69	26.1	650.00	900	RCC-NP-3	1.81	2.49	2.15	2.71	3.39	3.05
CO-90	MH-65	MH-66	485.18	485.98	482.69	482.64	35.4	650.00	900	RCC-NP-3	2.49	3.34	2.915	3.39	4.24	3.815
CO-91	MH-66	MH-67	485.98	486.64	482.64	482.59	31.6	650.00	900	RCC-NP-3	3.34	4.05	3.695	4.24	4.95	4.695
CO-92	MH-67	MH-68	486.64	487.79	482.59	482.56	16.5	650.00	900	RCC-NP-3	4.05	5.23	4.64	4.95	6.13	5.44
CO-93	MH-68	MH-69	487.79	485.87	482.56	482.53	24.7	650.00	900	RCC-NP-3	5.23	3.34	4.285	6.13	4.24	5.695

उपयंत्री
नगर परिषद बदनानगर
बि.स.ए.ए. (B.S.E.E.)

INDUCTION & INVERTOR OUTPUT REPORT

Label	Start Node	Stop Node	Elevation Ground (Start) (m)	Elevation Ground (Stop) (m)	Invert (Start) (m)	Invert (Stop) (m)	Length (m)	Slope (%)	Diameter (mm)	Material	Depth of Bench (Start) Methods	Depth of Bench (Stop) Methods	Depth of Bench (Average)	Condition (Start) Methods	Condition (Stop) Methods	Condition (Average)
CO-94	M1160	M1170	483.87	483.22	483.53	483.78	28.0	-11.53	000	RC-C-100-3	3.31	3.41	3.31	3.31	3.31	3.31
CO-95	M1170	M1171	483.32	483.51	483.08	483.63	30.4	630.00	1,000.00	RC-C-100-3	3.31	3.91	3.73	3.31	3.91	3.73
CO-96	M1171	M11220	483.53	484.12	483.63	483.51	29.9	330.00	1,000.00	RC-C-100-3	2.91	2.91	2.91	2.91	2.91	2.91
CO-97	M11220	M1172	484.12	483.53	481.54	481.43	29.0	330.00	1,000.00	RC-C-100-3	2.89	2.91	2.93	2.89	2.91	2.93
CO-98	M1172	M1173	483.53	484.07	481.42	481.37	30.7	630.00	1,000.00	RC-C-100-3	2.91	3.0	2.93	2.91	3.0	2.93
CO-99	M1173	M11221	484.07	484.13	483.37	481.42	31	630.00	1,000.00	RC-C-100-3	3.0	3.11	3.13	3.0	3.11	3.13
CO-100	M11221	M1174	484.13	483.9	483.52	481.28	30.3	630.00	1,000.00	RC-C-100-3	3.11	3.02	3.03	3.11	3.02	3.03
CO-101	M1174	M1175	483.9	483.76	481.28	481.24	23.5	630.00	1,000.00	RC-C-100-3	2.62	2.32	2.37	2.62	2.32	2.37
CO-102	M1175	M1176	483.76	483.91	481.24	481.2	26.5	630.00	1,000.00	RC-C-100-3	2.32	2.71	2.51	2.32	2.71	2.51
CO-103	M1176	M1177	483.91	484.17	481.2	481.55	29.7	630.00	1,000.00	RC-C-100-3	2.71	3.02	2.86	2.71	3.02	2.86
CO-104	M1177	M1178	484.17	484.4	481.15	481.1	35.9	630.00	1,000.00	RC-C-100-3	3.02	3.3	3.19	3.02	3.3	3.19
CO-105	M1178	M1179	484.4	485.13	481.1	481.03	46.7	630.00	1,000.00	RC-C-100-3	3.3	3.1	3.7	3.3	3.1	3.7
CO-106	M1179	M1180	485.13	485.3	481.03	481.03	39	630.00	1,000.00	RC-C-100-3	3.3	3.33	3.23	3.3	3.33	3.23
CO-107	R-C-M-03	M1177	485.15	485.03	483.99	483.92	19.6	330.00	200	RC-C-100-3	1.16	1.11	1.13	1.16	1.11	1.13
CO-108	R-C-M-02	M1157	488.62	488.47	487.46	487.12	12.4	307.65	200	RC-C-100-3	1.26	1.13	1.49	1.26	1.13	1.49
CO-109	M1181	M1182	493.01	493.19	491.9	491.86	29.6	630.00	700	RC-C-100-3	1.11	1.13	1.23	1.11	1.13	1.23
CO-110	M1182	M1183	493.19	493.65	491.58	491.54	30.5	630.00	700	RC-C-100-3	1.61	1.11	1.86	1.61	1.11	1.86
CO-111	M1183	M1184	493.65	492.66	491.15	491.05	26	330.00	700	RC-C-100-3	2.5	1.61	2.03	2.5	1.61	2.03
CO-112	M1184	M1185	492.66	492.29	490.68	490.64	28.4	330.00	700	RC-C-100-3	1.86	1.61	1.73	1.86	1.61	1.73
CO-113	M1185	M1186	492.29	491.34	490.68	490.64	27.1	630.00	700	RC-C-100-3	1.61	1.8	1.83	1.61	1.8	1.83
CO-114	M1186	M1187	491.34	491.44	490.64	490.61	23.6	630.00	700	RC-C-100-3	1.8	2.83	2.81	1.8	2.83	2.81
CO-115	M1187	M1188	491.44	491.82	490.61	490.58	17.3	630.00	700	RC-C-100-3	2.81	3.24	3.03	2.81	3.24	3.03
CO-116	M1188	M1189	491.82	493.32	490.58	490.53	29.4	630.00	700	RC-C-100-3	3.24	3.79	3.51	3.24	3.79	3.51
CO-117	M1189	M1190	493.32	493.36	490.53	490.49	29.8	630.00	700	RC-C-100-3	3.79	3.91	3.82	3.79	3.91	3.82
CO-118	M1190	M1191	493.36	492.97	490.49	490.43	29.4	630.00	700	RC-C-100-3	2.97	2.34	2.75	2.97	2.34	2.75
CO-119	M1191	M1192	492.97	493.01	490.44	490.4	28.2	630.00	700	RC-C-100-3	2.34	2.81	2.57	2.34	2.81	2.57
CO-120	M1192	M1193	493.01	493.17	490.4	490.46	25.2	630.00	700	RC-C-100-3	2.81	3.21	3.01	2.81	3.21	3.01
CO-121	M1193	M1194	493.17	493.08	490.46	490.42	24.5	630.00	700	RC-C-100-3	3.21	3.76	3.49	3.21	3.76	3.49
CO-122	M1194	M1195	493.08	492.49	490.42	490.38	25.8	630.00	700	RC-C-100-3	3.76	3.11	3.93	3.76	3.11	3.93
CO-123	M1195	M1196	492.49	491.4	490.38	490.34	24.8	630.60	700	RC-C-100-3	3.11	3.19	2.83	3.11	3.19	2.83
CO-124	M1196	M1197	491.4	494.11	490.34	490.21	22.7	630.00	700	RC-C-100-3	1.19	1.9	1.54	1.19	1.9	1.54

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INTERCEPTION & DIVERSION OUTPUT RESULT

Label	Start Node	Stop Node	Elevation Ground (Start) (m)	Elevation Ground (Stop) (m)	Invert (Start) (m)	Invert (Stop) (m)	Length (Sched) (m)	Slope (Calculated) (1/S)	Diameter (mm)	Material	Depth of Sewer (Start) Manhole	Depth of Sewer (Stop) Manhole	Depth of Sewer (Average)	Cushion (Start) Manhole	Cushion (Stop) Manhole	Cushion (Average)
CO:156	MH:129	MH:130	490.43	490.18	488.15	488.08	25.8	368.66	700	RCC-NP-3	2.28	2.1	2.19	2.98	2.8	2.89
CO:157	MH:130	MH:131	490.18	491.53	488.08	488.01	26	368.66	700	RCC-NP-3	2.1	3.52	2.81	2.8	4.22	3.51
CO:158	MH:131	MH:132	491.53	492.84	488.01	487.97	17.3	368.66	700	RCC-NP-3	3.52	4.87	4.195	4.22	5.57	4.895
CO:159	MH:132	MH:133	492.84	492.84	487.97	487.89	28.6	368.66	700	RCC-NP-3	4.87	4.93	4.9	5.57	5.63	5.6
CO:160	MH:133	MH:134	492.84	491.85	487.89	487.82	26.5	368.66	700	RCC-NP-3	4.93	4.03	4.48	5.63	4.73	5.18
CO:161	MH:134	MH:135	491.85	491.75	487.82	487.74	27.6	368.66	700	RCC-NP-3	4.03	4.01	4.02	4.73	4.71	4.72
CO:162	MH:135	MH:136	491.75	491.75	487.74	487.67	26.3	368.66	700	RCC-NP-3	4.01	4.08	4.045	4.71	4.78	4.745
CO:163	MH:136	MH:137	491.75	491.89	487.67	487.6	26.4	368.66	700	RCC-NP-3	4.08	4.29	4.185	4.78	4.99	4.885
CO:164	MH:137	MH:138	491.89	492.91	487.6	487.55	18.4	368.66	700	RCC-NP-3	4.29	5.36	4.825	4.99	6.06	5.525
CO:165	MH:138	MH:139	492.91	491.4	487.55	487.48	24.1	368.66	700	RCC-NP-3	5.36	3.92	4.64	6.06	4.62	5.34
CO:166	MH:139	MH:140	491.4	492.18	487.48	487.41	25.6	368.66	700	RCC-NP-3	3.92	4.77	4.345	4.62	5.47	5.345
CO:167	MH:140	MH:141	492.18	492.08	487.41	487.35	23	368.66	700	RCC-NP-3	4.77	4.73	4.75	5.47	5.43	5.45
CO:168	MH:141	MH:142	492.08	492.3	487.35	487.28	27.8	368.66	700	RCC-NP-3	4.73	5.02	4.875	5.43	5.72	5.575
CO:169	MH:142	MH:143	492.3	491.58	487.28	487.19	31.7	368.66	700	RCC-NP-3	5.02	4.39	4.705	5.72	5.09	5.405
CO:170	MH:143	MH:144	491.58	490.47	487.19	487.11	29.8	368.66	700	RCC-NP-3	4.39	3.36	3.875	5.09	4.06	4.575
CO:171	MH:144	MH:145	490.47	490.83	487.11	487.02	33.9	368.66	700	RCC-NP-3	3.36	3.81	3.585	4.06	4.51	4.285
CO:172	MH:145	MH:146	490.83	489.87	487.02	486.94	27.1	368.66	700	RCC-NP-3	3.81	2.93	3.37	4.51	3.63	4.07
CO:173	MH:146	MH:147	489.87	489.62	486.94	486.86	29.9	368.66	700	RCC-NP-3	2.93	2.76	2.845	4.51	3.46	3.545
CO:174	MH:147	MH:148	489.62	489.62	486.86	486.79	28.6	368.66	700	RCC-NP-3	2.76	2.83	2.795	3.46	3.53	3.485
CO:175	MH:148	MH:149	489.62	488.25	486.7	486.64	15.2	250.00	700	RCC-NP-3	2.76	1.61	2.265	3.62	2.31	2.865
CO:176	MH:149	MH:150	488.25	487.86	486.34	486.25	22.8	250.00	700	RCC-NP-3	2.92	1.61	1.76	2.61	2.31	2.46
CO:177	MH:150	MH:151	487.86	489.45	486.25	486.19	21.3	368.66	700	RCC-NP-3	1.61	3.26	2.435	2.31	3.86	3.135
CO:178	MH:151	MH:152	489.45	487.76	486.19	486.11	27.8	368.66	700	RCC-NP-3	3.26	1.65	2.455	3.86	2.45	3.155
CO:179	MH:152	MH:153	487.76	486.18	484.68	484.57	28.2	250.00	700	RCC-NP-3	3.08	1.61	2.345	3.78	2.31	3.045
CO:180	MH:153	MH:154	486.18	487.75	484.57	484.5	26.4	368.66	700	RCC-NP-3	1.61	3.25	2.43	2.31	3.85	3.14
CO:181	MH:154	MH:155	487.75	489.03	484.5	484.4	35.3	368.66	700	RCC-NP-3	3.25	4.63	3.54	3.85	3.33	4.64
CO:182	MH:155	MH:156	489.03	488.64	484.4	484.33	27.9	368.66	700	RCC-NP-3	4.63	4.31	4.47	3.33	3.01	3.77
CO:183	MH:156	MH:157	488.64	488.47	484.33	484.25	26.6	368.66	700	RCC-NP-3	4.31	4.22	4.285	3.01	4.52	4.365
CO:184	MH:157	MH:158	488.47	486.6	484.25	484.21	23.5	594.35	700	RCC-NP-3	4.22	2.39	3.305	4.52	3.08	4.805
CO:185	MH:158	MH:159	486.6	486.75	484.21	484.18	19.9	594.35	700	RCC-NP-3	2.39	2.57	2.48	3.08	3.27	3.14
CO:186	MH:159	MH:160	486.75	486.99	484.18	484.11	39.3	594.35	700	RCC-NP-3	2.57	2.88	2.73	3.27	3.58	3.425

नगर पालिका बसनागर
डिवीजन (म.प.)

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डिवीजन (म.प.)

INTERCEPTION & DIVERSION OUTPUT RESULT

Label	Start Node	Stop Node	Elevation Ground (Start) (m)	Elevation Ground (Stop) (m)	Invert (Start) (m)	Invert (Stop) (m)	Length (Scaled) (m)	Slope (Calculated) (1/S)	Diameter (mm)	Material	Depth of Sewer (Start) Manhole	Depth of Sewer (Stop) Manhole	Depth of Sewer (Average)	Cushion (Start) Manhole	Cushion (Stop) Manhole	Cushion (Average)
CO-187	MH:160	MH:161	486.99	486.98	484.11	484.06	30.6	594.35	700	RCC-NP-3	2.88	2.92	2.9	3.58	3.62	3.6
CO-188	MH:161	MH:162	486.98	485.83	484.06	484.01	32.5	594.35	700	RCC-NP-3	2.92	1.82	2.37	1.62	2.52	3.07
CO-189	MH:162	MH:163	485.83	485.85	484.01	483.94	41	594.35	700	RCC-NP-3	1.82	1.91	1.865	2.32	2.61	2.565
CO-190	MH:163	MH:164	485.85	486.22	483.94	483.88	33.9	594.35	700	RCC-NP-3	1.91	2.34	2.125	2.61	3.04	2.825
CO-191	MH:164	MH:165	486.22	486.66	483.88	483.83	30.4	594.35	700	RCC-NP-3	2.34	2.83	2.585	1.94	3.53	3.285
CO-192	MH:165	MH:166	486.66	487	483.83	483.78	27.1	594.35	700	RCC-NP-3	2.83	3.22	3.025	3.53	3.92	3.725
CO-193	MH:166	MH:167	487	486.45	483.78	483.71	43.3	594.35	700	RCC-NP-3	3.22	2.74	2.98	3.92	3.44	3.68
CO-194	MH:167	MH:168	486.45	486.64	483.71	483.67	23.6	594.35	700	RCC-NP-3	2.74	2.97	2.855	3.44	3.67	3.555
CO-195	MH:168	MH:169	486.64	486.52	483.67	483.6	41.3	594.35	700	RCC-NP-3	2.97	2.92	2.945	3.67	3.62	3.645
CO-196	MH:169	MH:170	486.52	485.96	483.6	483.53	45.6	594.35	700	RCC-NP-3	2.92	2.43	2.675	3.62	3.13	3.175
CO-197	MH:170	MH:171	485.96	487.29	483.53	483.45	43.5	594.35	700	RCC-NP-3	2.43	3.84	3.135	3.13	4.54	3.835
CO-198	MH:171	MH:172	487.29	486.37	483.45	483.41	27.4	594.35	700	RCC-NP-3	3.84	2.96	3.4	4.54	3.66	4.1
CO-199	MH:172	MH:173	486.37	486.29	483.41	483.39	11.3	594.35	700	RCC-NP-3	2.96	2.9	2.93	1.66	3.6	3.03
CO-200	MH:173	MH:174	486.29	486.16	483.39	483.33	32.2	594.35	700	RCC-NP-3	2.9	2.83	2.865	1.6	3.53	3.665
CO-201	MH:174	MH:175	486.16	485.93	483.33	483.28	29.5	594.35	700	RCC-NP-3	2.83	2.65	2.74	1.53	3.35	3.44
CO-202	MH:175	MH:176	485.93	484.53	483.01	482.92	22.7	594.35	700	RCC-NP-3	2.65	1.61	2.265	1.62	2.31	2.865
CO-203	MH:176	MH:177	484.53	485.03	482.92	482.89	20.3	594.35	700	RCC-NP-3	1.61	2.14	1.875	2.11	2.84	2.575
CO-204	MH:177	MH:178	485.03	485.22	482.89	482.84	29.1	650.00	700	RCC-NP-3	2.14	2.38	2.26	2.84	3.08	2.96
CO-205	MH:178	MH:179	485.22	486.14	482.84	482.79	35.1	650.00	700	RCC-NP-3	2.38	3.35	2.865	1.08	4.05	3.665
CO-206	MH:179	MH:180	486.14	485.69	482.79	482.74	27.8	650.00	700	RCC-NP-3	3.35	2.95	3.15	4.05	3.65	3.85
CO-207	MH:180	MH:181	485.69	486.69	482.74	482.69	34.9	650.00	700	RCC-NP-3	2.95	4	3.475	3.65	4.7	4.175
CO-208	MH:181	MH:182	486.69	486.16	482.69	482.65	27.8	650.00	700	RCC-NP-3	4	3.51	3.755	4.7	4.21	4.455
CO-209	MH:182	MH:183	486.16	485.67	482.65	482.6	28.9	650.00	700	RCC-NP-3	3.51	3.07	3.29	4.21	3.72	3.99
CO-210	MH:183	MH:184	485.67	485.39	482.6	482.56	28.9	650.00	700	RCC-NP-3	3.07	2.83	2.95	3.72	3.53	3.63
CO-211	MH:184	MH:185	485.39	485.4	482.56	482.52	27.9	650.00	700	RCC-NP-3	2.83	2.88	2.855	3.53	3.58	3.555
CO-212	MH:185	MH:186	485.4	485.79	482.52	482.47	29.7	650.00	700	RCC-NP-3	2.88	3.32	3.1	3.58	4.02	3.8
CO-213	MH:186	MH:187	485.79	485.25	482.47	482.3	44	650.00	700	RCC-NP-3	3.32	2.85	3.085	4.02	3.55	3.785
CO-214	MH:187	MH:188	485.25	483.19	482.3	481.58	28.6	250.00	700	RCC-NP-3	3.56	1.61	2.585	4.26	3.31	3.285
CO-215	R-CM-04	MH:188	484.36	483.19	482.13	482.08	13.7	250.00	200	RCC-NP-3	2.23	1.11	1.67	3.33	3.31	1.87
CO-216	MH:188	MH:189	483.19	483.34	481.58	481.53	29.5	650.00	700	RCC-NP-3	1.61	1.81	1.71	3.31	2.51	2.41
CO-217	MH:189	MH:190	483.34	484.17	481.53	481.49	28.1	650.00	700	RCC-NP-3	1.81	2.08	2.245	2.51	3.38	2.995

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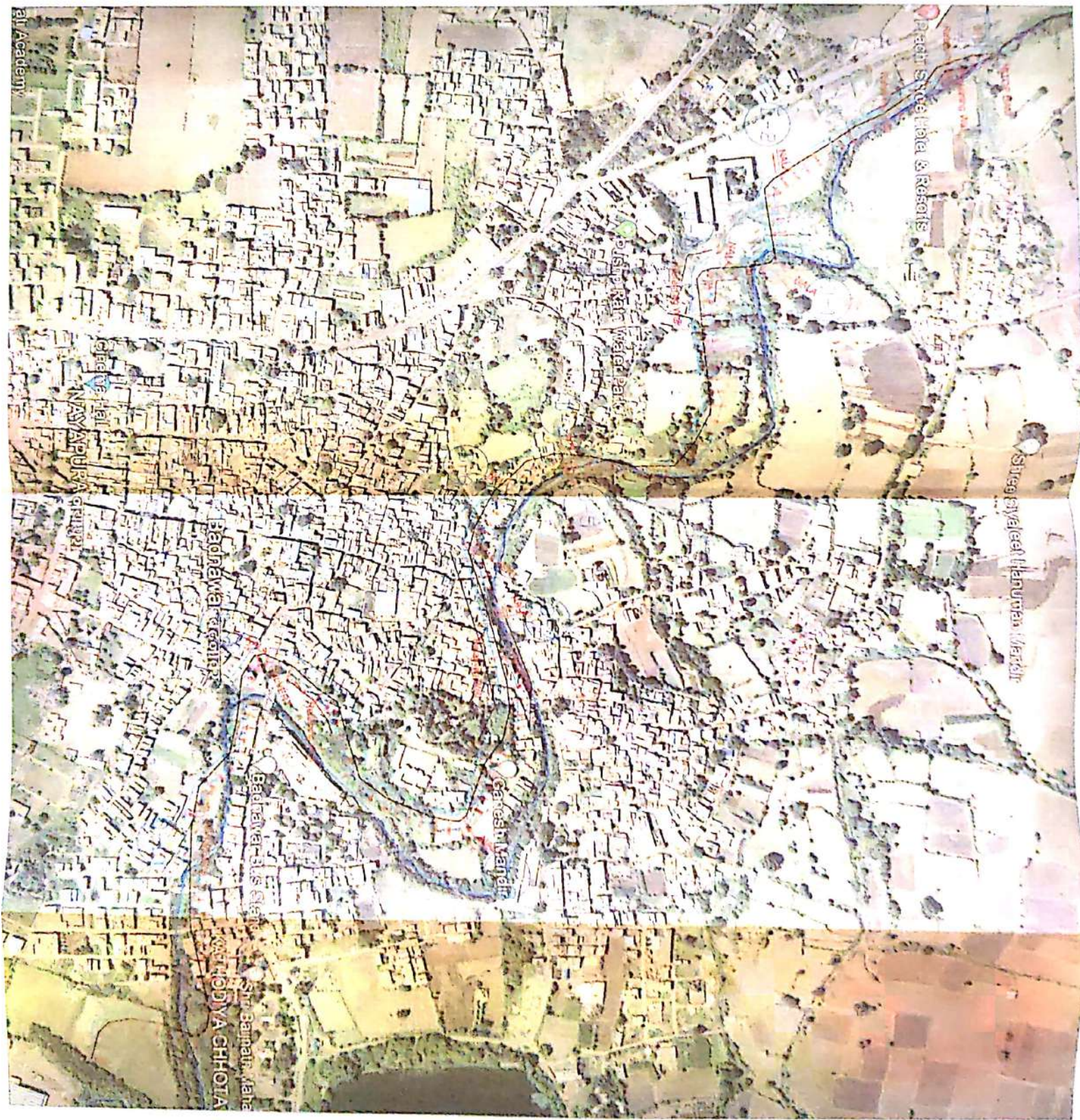
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INTERCEPTION & DIVERSION DUCTILE RESULT

Label	Start Node	Stop Node	Elevation Ground (Start) (m)	Elevation Ground (Stop) (m)	Invert (Start) (m)	Invert (Stop) (m)	Length (Scaled) (m)	Slope (Calculated) (1/S)	Diameter (mm)	Material	Depth of Sewer (Start) Manhole	Depth of Sewer (Stop) Manhole	Depth of Sewer (Average)	Cushion (Start) Manhole	Cushion (Stop) Manhole	Cushion (Average)
CO-218	MH:190	MH:191	484.17	484.74	481.49	481.45	29	650.00	700	RCC-NP-3	2.68	3.29	2.985	3.38	3.99	3.685
CO-219	MH:191	MH:192	484.74	485.36	481.45	481.4	29.2	650.00	700	RCC-NP-3	3.29	3.96	3.625	3.99	4.66	4.325
CO-220	MH:192	MH:193	485.36	484.7	481.4	481.36	25.6	650.00	700	RCC-NP-3	3.96	3.34	3.65	4.66	4.04	4.35
CO-221	MH:193	MH:194	484.7	484.47	481.36	481.31	32	650.00	700	RCC-NP-3	3.34	3.16	3.25	4.04	3.86	3.95
CO-222	MH:194	MH:80	484.47	485.3	481.31	480.27	29.2	645.97	700	RCC-NP-3	3.16	4.03	3.595	3.86	4.71	4.295
CO-223	MH:80	O-1	485.3	485.39	480.97	480.93	22.8	650.00	1,000.00	RCC-NP-3	4.33	4.46	4.395	5.33	5.46	5.395

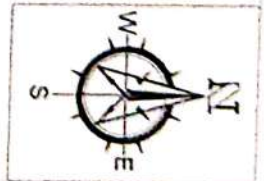
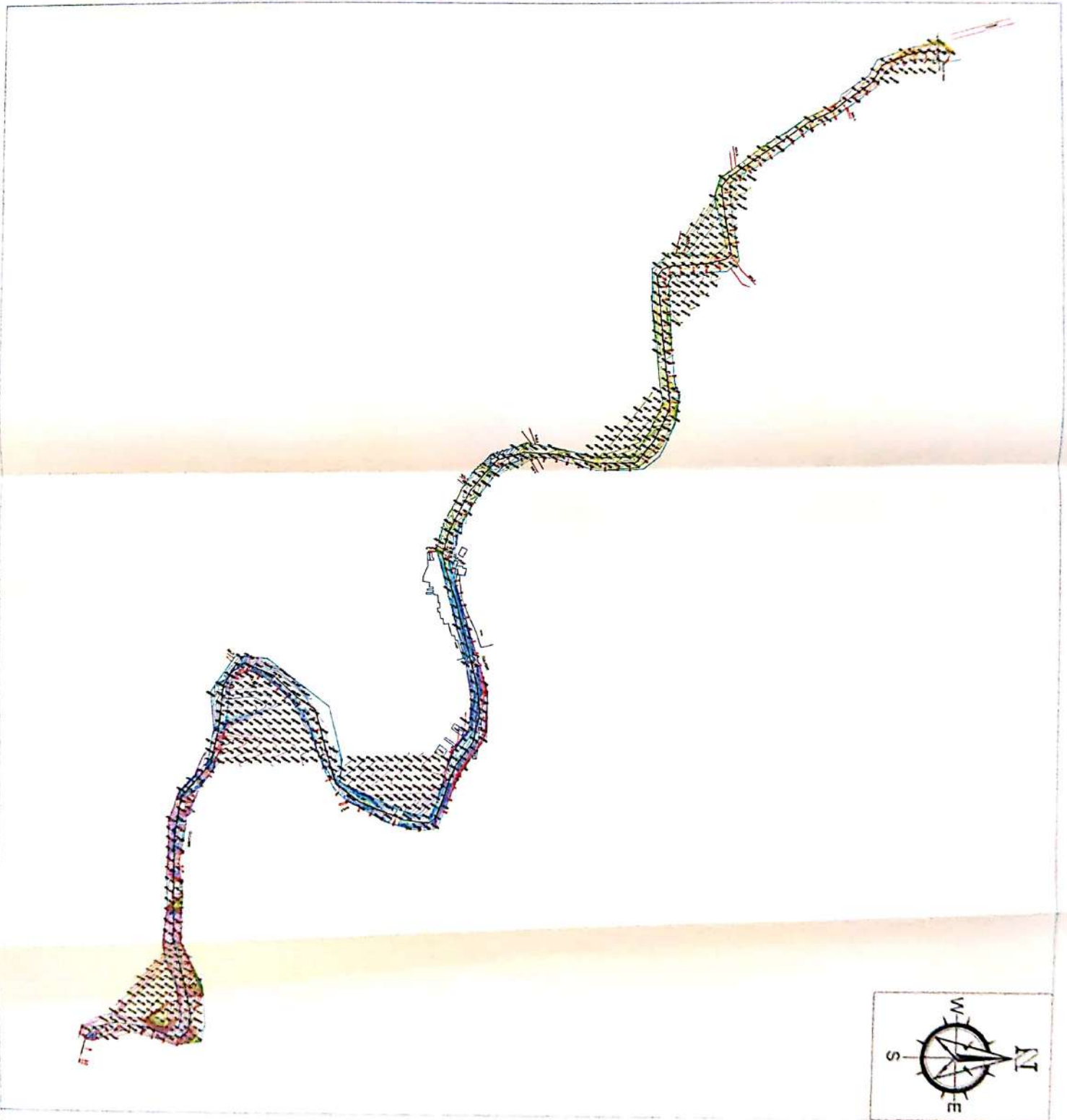
उपयुक्ती
नगर परिषद वदनावर
जिला धार (म.प्र.)

मुख्य नगर मालिका अधिकारी
नगर परिषद, वदनावर
जिला धार (म.प्र.)




 नगर परिषद, मदनानकर
 जिला धार (म.प्र.)

मुख्य नगर माहिलिका अधिकारी
 नगर परिषद, मदनानकर
 जिला धार (म.प्र.)




(Signature)
उपनिर्देशी
नगर परिषद बलनावर
जिला धार (म.प्र.)

(Signature)
मुख्य नगर प्रमोदिका अधिकारी
नगर परिषद, बलनावर
जिला धार (म.प्र.)

Abstract of Cost of Works Project		
S.No.	Particular	Total Amount (Lakhs)
1	Stop Dam (Length 20 m X 15 Width X 4.5 m Depth)	98.59
2	Interception & Diversion (Tapping Nalla's): Including Preparation of Bed, Installing Screens, RCC Chambers etc. Complete.	52.39
3	Providing and Laying non-pressure (NP3) RCC socket & spigot pipes with rubber gasket joint including testing of joints Diameter from 700 mm to 1000 mm.	491.0
4	Construction Supply, Installation Testing and Commissioning of Civil, Mechanical, Electrical Works of Sewage Treatment Plant of 3.0 MLD based on suitable technology.	410.00
5	Retaining Wall of Total Length 200 meters	59.02
6	Project Cost	1111.00
7	GST @ 18%	200.00
Project Cost with GST (A)		1311.00
8	O & M Cost @ 5 Year (B)	146.73
Total Project Cost in Lakh (A+B)		1457.73
Total Project Cost in Cr (A+B)		14.58

Financial Structure of Project		
Total Project Cost in Lakh		1457.73
1	Fund Available with ULB as sanctioned under CM Infra Scheme	770.00
2	Fund Available with ULB from previous tender under scheme	53.36
3	Fund to be sanction under SBM 2.0 for Liquid Waste Management (Central and State Share)	529.20
Total Fund Available		1352.56
4	Balance fund will be from "Vishesh Nidhi" or other source (in Lakh)	105.17


 उपमंडला
 नगर परिषद बदनावर
 जिला धार (म.प्र.)


 मुख्य नगर पालिका अधिकारी
 नगर परिषद, बदनावर
 जिला धार (म.प्र.)



Civil works Estimate for Beautification & Purification of Bahwanti River, Badnawar District - Dhar [M.P.] Estimate No. 1										
Detail Estimate of Stop Dam on Bahwanti River, Badnawar										
Estimate prepared as per ISSR of Department of Urban Administration & Development, Government of Madhya Pradesh, in force from - 2nd August 2021 - (VOLUME I, II & III)										
Sr. No.	Specifications of Item	SOR page no. sr.no.	No.	Length	Width	Depth/Height	Total quantity	Unit	Rate (in INR)	Amount
1.0	Earthwork in excavation for foundation, trenches for pipes/cables or drains etc. by mechanical means manual means(exceeding 30 cm in depth) including ramming of bottom, dressing of sides, disposal of excavated earth including of all lift and lead upto 50 m. Disposed earth to be levelled and neatly dressed.									
	All kinds of ordinary soil	2.6.1								
	Abutment (12.50+0.60-0.6)		2.00	13.70	3.00	1.27	104.39	sqm	157	16285.23
	Bank protection (12.50+0.60+0.60)		2.00	13.70	4.80	1.63	214.38	sqm	157	33657.66
	Wing wall (12.50+0.60-0.60)		2.00	13.70	1.80	0.57	28.11	sqm	157	4413.27
	Key wall (7.0+0.60) (1.50+0.60)		2.00	3.00	7.60	0.80	30.48	sqm	157	4785.36
	Arpon (18.50+0.75+0.75) (11.0+0.60+0.60)		1.00	20.00	12.20	0.60	145.40	sqm	157	22827.80
	Ordinary Rock	2.6.2								
			1.00	18.50	6.00	1.00	111.00	sqm	261	28971.00
			1.00	18.50	1.00	1.10	20.35	sqm	261	5311.35
	Hard Rock (requiring blasting)	2.6.3								
			1.00	18.50	4.50	0.75	62.44	sqm	805.00	50264.20
2.0										
	Cement Concrete (M20)									
	Providing and laying cement concrete in retaining walls, return walls, walls (any thickness) including attached pilasters, columns, piers, abutments, pillars, posts, struts, buttresses, string or facing courses, parapets, coping, bed blocks, anchor blocks, plain window sills, fillets etc. up to floor two level, excluding the cost of centering, shuttering and finishing.	32/4.2/Vol 2								
	Concrete grade M-20 (nominal mix) with 20 mm maximum size of stone aggregate	4.2.2								

sides	2.00	0.60	1.20	1.44
sides	2.00	0.60	0.60	0.72
extra concrete work on abutment upto bank	8.00	3.40	1.80	34.56
wing wall (H)	4.00	12.50	0.30	15.00
wing wall (H)	4.00	1.50	0.30	1.80
wing wall (H)	2.00	12.50	2.60	65.00
wing wall (H)	4.00	1.05	2.60	10.92
wing wall (H) slope portion	2.00	12.50	3.50	87.50
BOX (1)	4.00	3.90	2.60	30.16
extra wall				0.00
key wall base	4.00	7.00	0.30	8.40
key wall base	2.00	1.80	0.30	1.08
key wall base upper portion	2.00	7.00	2.60	36.40
key wall base upper portion	2.00	1.20	2.60	6.24
M-25				
main body nose wall V/s nose				
vertical (1)	1.00	18.50	1.80	31.10
vertical (1)	2.00	0.45	1.80	1.62
horizontal (2)	1.00	18.50	0.45	8.11
horizontal (2)	1.00	1.50	0.45	0.68
main body wall front face (3)	1.00	18.50	2.60	48.10
deduct for gate opening	-5.00	1.50	2.00	-15.00
top cover (4)	1.00	18.50	0.45	8.11
top cover (4)	2.00	1.50	0.45	1.33
D/S slope (5)	2.00	1.80	0.45	3.42
D/S apron (6)	2.00	1.00	0.30	3.00
D/S apron (6)	1.00	18.50	0.30	5.53
opening sill	10.00	1.40	0.45	10.80
opening sill	10.00	1.50	0.45	10.33
opening side	10.00	1.50	2.00	30.00
opening side	20.00	0.45	2.00	18.00
opening side triangular portion	20.00	1.00	2.13	60.30

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ribs bottom portion		4.00	26.60	0.60	63.84	973.07	sq m	362	3.52.249.53
Reinforced Cement Concrete									
6.0	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding upto floor level including cost of binding wire, wastage and over laps upto 12mm horizontal/ inclined position of reinforcement bars in slab and beams, plinth, chajjas, lintels, upto 4.5m vertical length of reinforcement in wall columns (over laps shall be provided as per requirement of IS : 13920; IS 456 & SP : 34) etc. complete.	47/5.11/Vol 2							
	Thermo-Mechanically Treated bars(Fe 500 D or more)	5.11.4							
7.0	130 kg/cum	228.45	130.00			29,698.57	kg	58	17,22,516.77
Filling									
7.0	Filling by available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.	19/2.16/Vol 2							
	back side of main body	2.00	18.50	0.75	1.80	49.95			
	back side of wing wall	2.00	2.90	0.75	2.90	12.62			
	back side of U/S wing wall	4.00	3.00	1.80	2.50	54.00			
	back side D/S wing wall	2.00	18.50	0.75	2.90	80.48			
	back side of key wall	2.00	6.00	0.75	2.90	26.10			
						223.14	cum	89	19,829.46
8.0	Extra for every additional lift of 1.5 m or part thereof in.	19/2.17/Vol 2							
	All kinds of soil.	2.17.1							
	back side of main body	2.00	18.50	0.75	0.30	8.33			
	back side of wing wall	2.00	2.90	0.75	1.40	12.62			
	back side of U/S wing wall	4.00	3.00	1.80	1.00	21.00			
	back side D/S wing wall	2.00	18.50	0.75	1.40	38.85			
	back side of key wall	2.00	6.00	0.75	1.40	12.60			
						87.47	cum	37	3,136.21


Civil works Estimate for Beautification & Purification of Belwan Nallah, Badnawar District - Dhar [M.P.]											Estimate	2
Detail Estimate of RCC Channel, Chamber & Screens at Nalla												
Estimate prepared as per ISSR of Department of Urban Administration & Development, Government of Madhya Pradesh, in force from - 2 nd August 2021 - (VOLUME II) Building Works												
S.no	Reference	Item	Nos	I.	II	III	Qty	Unit	Rate	Amount		
Excavation												
1.1	UADD SOR Vol I Clause No 18.2 Pg. no. 227	Earth work in excavation for foundation, trenches for pipes / cables or drains etc. by mechanical means / manual means (exceeding 30cm in depth) including ranning of bottom, dressing of sides, disposal of excavated earth including of all lift and lead upto 50m Disposed earth to be levelled and neatly dressed										
	18.2.1	All kinds of ordinary soil	1	3.8	3.8	2.6	37.54	Cum	151	₹ 5,669.14		
Mooram Filling												
2.1	19/2.18.1	Supplying and filling in plinth under floors including, watering, ranning consolidating and dressing complete. Mooram/Hard copra	1	3.8	3.8	0.30	4.33	Cum	478	₹ 2,070.70		
PCC												
3.1	UADD SOR Vol I Clause No.18.15 Pg. no. 230	Providing and laying in position M-20 (Nominal Mix) with 20 mm maximum size of stone aggregate of reinforced cement concrete excluding the cost of centering, shuttering, finishing and reinforcement	1	3.8	3.8	0.1	1.44	Cum	5435	₹ 7,848.14		
RCC												
4.1	UADD SOR Vol.II Clause No.5.23 Pg. no. 49	Providing and laying in position ready mixed M-25 grade concrete for reinforced cement concrete work, using cement content as per approved design mix, manufactured in fully automatic batching plant and transported to site on work in transit mixer for all leads, having continous aggitated mixer, manufacturer as per mix design of specified grade for reinforced cement work, including pumping of concrete to site of laying but excluding the cost of centering, shuttering, finishing and reinforcement, including Admixtures in recommended proportions as per IS9103 to accelerate, retard setting of concrete, improve workability without impairing strength and durability as per direction of Engineer-in-charge.										
	5.23.1	Upto Plinth level						Cum	5826			
	5.24.1	Providing M-30 grade concrete instead of M-25 grade RMC.						Cum	66			
		For Base	1	3.8	3.8	0.2	2.9	Cum				
		For Wall (Long)	2	3.2	0.2	2	2.56	Cum				
		For Wall (Short)	2	2.8	0.2	2	2.24	Cum				
							Total		7.69	5892	₹ 45,297.70	
Shuttering												
5.1	UADD Bulding SOR Vol.II Clause No.19 Pg. no. 208	Centering and shuttering including strutting, propping stretching etc. complete for and removal of form work by sheet plate or plywood shuttering for										
	19.1.1	Foundations, footings, bases of columns, etc. For mass concrete	4	3.8		0.2	3.0	Sq.M	160	₹ 486.40		
	19.1.2	Walls (any thickness) including attached pilasters, butteresses, plinth and string courses etc (long)	2	12		1.7	40.8	Sq.M	289	₹ 11,791.20		

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		Reinforcement								
6.1	HAIRS FOR VOLT Class No 18.23 Pg no 231	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding upto Dose level including cost of binding wire, montage and over lift upto 12mm horizontal/ inclined position of reinforcement bars in slab and beams, cloth, chairs, laths, upto 4.5m vertical length of reinforcement in wall columns (over lift shall be provided as per requirement of IS - 11930, IS 436 & SP 34) etc. complete	7.888	Ro	Rq/Conn	615.04	RQ	Conn	SR	₹ 35,672.37
	18.23.4	Thermo-Mechanically Treated bars (Fe 500 D) or more)								
		Screens								
7.1	Market Rate	Providing and supply of Cast Iron Screen having pore size 40mm of Length ranging from 0.9 to 2.0m. Make of S.S. with frame arrangement to remove screen part for cleaning purpose and as directed by Engineer-in-charge, complete					2	Each	RRRR	₹ 160,000.00
		Drain Channel								
8.1	RCC channel	Channel for connecting nallas to Chamber					1	Each	778/91.2	₹ 778,905.20
Total Cost of RCC Chamber on Nallas Tapping point For Manhole Stop Dam										₹ 1,047,826.00
05 No of Chamber (Rs)										₹ 5,239,133.00
05 No of Chamber (Lakh)										₹ 52.39


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 नगर परिषद, बदनावर
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Civil works Estimate for Beautification & Purification of Bahwanli River, Badnawar District - Dhar (M.P.)										Estimate No. 2 (A)	
Detail Estimate of RCC Channel (Nalla)											
Estimate prepared as per ISSR of Department of Urban Administration & Development, Government of Madhya Pradesh, in force from - 2nd August 2021 - (VOLUME I) Building Works											
Sr. No.	Specifications of Item	SOR page no./sr.no.	No.	Length	Width	Dept / Height	Total quantity	Unit	Rate (in INR)	Amount	
Nalla 3 - 1.20*1.50 m											
1.0	Earth work in excavation for foundation, trenches for pipes / cables or drains etc. by mechanical means / manual means (exceeding 30cm in depth) including ramming of bottom, dressing of sides, disposal of excavated earth including of all lift and lead upto 50m. Disposed earth to be levelled and neatly dressed.	17/2.6/Vol 2									
	All kinds of soil	2.6.1	1.00	80.00	1.80	1.95	280.80				
							280.8	cum	151		42,400.800
2.0	Supplying and filling in plinth under floors including, watering, ramming consolidating and dressing complete.	19/2.8/Vol 2									
	Maximum Hard copra		1.00	80.00	1.80	0.15	21.60				
							21.60	cum	478.00		₹ 10,324.80
3.0	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering All work up to plinth level.	32/4.1/Vol 2									
	Cement concrete grade M-10 (Nominal Mix) with 20 mm maximum size of stone aggregate	4.1.4	1	80	1.8	0.1	14.4				
							14.4	cum	4219.00		₹ 60,753.60
4.0	Providing and laying in position specified grade of reinforced cement concrete excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level :	46/5.1/Vol 2									
	Cement concrete grade M-20 (Nominal Mix) with 20 mm maximum size of stone aggregate.	5.1.1	2	80	0.2	1.5	48				
			1	80	1.4	0.2	22.4				
							70.4	cum	5435.00		₹ 382,624.00
5.0	Centering and shuttering including strutting, propping stretching etc. complete for and removal of form work by sheet plate or ply wood shuttering for :	208/19.1/Vol 2									
	Foundations, footings, bases of columns, etc. For mass concrete.	19.1.1	2.00	80.00	1.70		272.00				
			1.00	80.00	1.50		120.00				
							392.00	cum	160		62,720.00
5.0	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding upto floor level including cost of binding wire, wastage and over laps upto 12mm horizontal/ inclined position of reinforcement bars in slab and beams, plinth, chajjas, lintels, upto 4.5m vertical length of reinforcement in wall columns (over laps shall be provided as per requirement of IS : 13920; IS 456 & SP :34) etc. complete.	47/5.11.4/Vol 2									
	60 kg						3796	kg	58.00		₹ 220,168.00
Total amount											₹ 778,991.20


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Civil works Estimate for Beautification & Purification of Balwantl River, Badnawar District - Dhar [M.P.]							Estimate No.	3		
Civil works Estimate for RCC Nalla tapping point										
Estimate prepared as per ISSR of Department of Urban Administration & Development, Government of Madhya Pradesh; in force from - 2nd August 2021										
S.No.	Ref of Sor	Particulars	Unit	L	W	D/H	Quantity	Rate (Rs.)	Amount (Rs.)	
1.0			Earthwork							
1.1	UADD SOR Vol. 1 Item No. 18.2 Pg. no. 227	Earth work in excavation for foundation, trenches for pipes / cables or drains etc. by mechanical means / manual means (exceeding 30cm in depth.) including ramming of bottom, dressing of sides, disposal of excavated earth including of all lift and lead upto 50m. Disposed earth to be levelled and neatly dressed.								
	18.2.1	All kinds of ordinary soil	CUM					151		
	18.2.5	Extra for every additional lift of 1.5m or part there of over item 16.2 (Note: Only for depth of trench exceeding 1.5m for laying of sewer line and water line and manhole / chamber including all site clearances, adequate barricades, construction signs, red lanterns and guards as required, dewatering, scaffolding, timbering, machinery, tools implements and generally of all means used for the fulfillment of these items.)						20% extra of the rate of excavation		
		For Pipe								
		Depth upto 0.9-1.5m	CUM	-	-	-	13025.50	181.2	₹ 23,60,221.00	
		Depth upto 1.5-3.0m	CUM	-	-	-	12845.64	181.2	₹ 23,27,630.00	
		Depth upto 3.01-4.5m	CUM	-	-	-	4455.80	181.2	₹ 8,07,391.00	
		Depth upto 4.51-6.0m	CUM	-	-	-	361.62	181.2	₹ 65,526.00	
		For Manhole								
		Depth upto 0.9-1.5m	CUM	-	-	-	1157.78	181.2	₹ 2,09,780.00	
		Depth upto 1.5-3.0m	CUM	-	-	-	1012.56	181.2	₹ 1,83,476.00	
		Depth upto 3.01-4.5m	CUM	-	-	-	307.00	181.2	₹ 55,629.00	
		Depth upto 4.51-6.0m	CUM	-	-	-	23.35	181.2	₹ 4,232.00	
	18.2.6	Extra for every additional lead upto 1 km item 18.2	CUM					92.87		
	18.2.7	Extra rates for quantities of works, executed in difficult conditions: (The extra percentage rate is applicable in respect of each item but limited to quantities of work executed in these difficult conditions).								

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	In or under water and / or liquid mud, including pumping out water as required, (All water that may accumulate in excavations during the progress of the work from seepage, (not due to the negligence of the contractor), shall be bailed, pumped out or otherwise removed. The contractor shall take adequate measures for bailing and / or pumping out water from excavation and / or pumping out water from excavation and construct diversion channels, bunds, sumps, etc)				(20% extra of the rate of each item. The extra percentage in rate is applicable, to quantities of work executed, in difficult condition.)		
18.2.7.1	For Pipe						
	Depth upto 0.9-1.5m	-	-	-	-	-	
	Depth upto 1.5-3.0m	-	-	-	36.24	₹ 4,72,045.00	
	Depth upto 3.01-4.5m	-	-	-	36.24	₹ 4,65,526.00	
	Depth upto 4.51-6.0m	-	-	-	36.24	₹ 1,61,479.00	
	For Manhole					₹ 13,106.00	
	Depth upto 0.9-1.5m	-	-	-	-	-	
	Depth upto 1.5-3.0m	-	-	-	36.24	₹ 41,958.00	
	Depth upto 3.01-4.5m	-	-	-	36.24	₹ 36,696.00	
	Depth upto 4.51-6.0m	-	-	-	36.24	₹ 11,126.00	
		-	-	-	36.24	₹ 847.00	
	PIPE BEDDING						
1.2	UADD SOR Vol. 1 Item No. 18.2.8 Pg. no. 228	Filling by available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.					
		700 mm dia pipe	3887.5	1.4	0.2	816.4	₹ 72,660.00
		800 mm dia pipe	1017.8	1.5	0.2	229.1	₹ 29,389.90
		900 mm dia pipe	867.8	1.7	0.2	221.3	₹ 19,695.70
		1000 mm dia pipe	405.9	1.9	0.2	115.7	₹ 10,297.30
		Total	6179				
1.3	19/2.8/Vol 2	Supplying and filling in plinth under floors including, watering, ramming consolidating and dressing complete.					
		Moorum/Hard copra					
		700 mm dia pipe	3887.5	0.8	0.2	622.0	₹ 2,97,316.00
		800 mm dia pipe	1017.8	0.9	0.2	183.2	₹ 87,571.51

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		900 mm dia pipe	CUM	867.8	1.0	0.2	173.6	478.00	₹ 82,961.68
		1000 mm dia pipe	CUM	405.9	1.1	0.2	89.3	478.00	₹ 42,684.44
		Total	CUM	6179					
2.0		NP3 PIPE							
2.1	UADD SOR Vol. 1 Item No. 11.2 Pg. no. 147	Providing and supply of DWC HDPE Pipes of renowned duly tested inclusive of all taxes related to central, state and municipal, inclusive of excise duty, inspection charges, transportation charges, transit insurance, loading/unloading and stacking at site/ store etc, complete.							
		Internal dia/ Outer dia							
		11.2.2 100 mm / 120 mm ID/OD	RMT					155.00	
		11.2.3 135 mm / 160 mm ID/OD	RMT					220.00	
		11.2.4 150 mm / 180 mm ID/OD	RMT					320.00	
		11.2.5 170 mm / 200 mm ID/OD	RMT					343.00	
		11.2.6 200 mm / 238 mm ID/OD	RMT					538.00	
		11.2.7 250 mm / 295 mm ID/OD	RMT					882.00	
		11.2.8 300 mm / 345 mm ID/OD	RMT					1260.00	
		11.2.9 400 mm / 480 mm ID/OD	RMT					1753.00	
		11.2.10 500 mm / 580 mm ID/OD	RMT					2622.00	
		11.2.11 600 mm / 715 mm ID/OD	RMT					4186.00	
		Total	RMT						
2.2	UADD SOR Vol. 1 Item No. 12.3 Pg. no. 155	Providing and Laying non-pressure (NP3) RCC socket & spigot pipes with rubber gasket joint including testing of joints.							
		12.3.1 150 mm dia pipe	RMT				0	437.00	₹ 0.00
		12.3.2 225 mm dia pipe	RMT	141.1			141.1	569.00	₹ 80,286.00
		12.3.3 250 mm dia pipe	RMT				0	660.00	₹ 0.00
		12.3.4 300 mm dia pipe	RMT				0	964.00	₹ 0.00
		12.3.5 350 mm dia pipe	RMT				0	1662.00	₹ 0.00
		12.3.6 400 mm dia pipe	RMT				0	2047.00	₹ 0.00
		12.3.7 450 mm dia pipe	RMT				0	2287.00	₹ 0.00
		12.3.8 500 mm dia pipe	RMT				0	2533.00	₹ 0.00
		12.3.9 600 mm dia pipe	RMT				0	3549.00	₹ 0.00
		12.3.10 700 mm dia pipe	RMT	3887.5			3887.5	4180.00	₹ 1,62,49,750.00
		12.3.11 800 mm dia pipe	RMT	1017.8			1017.8	5725.00	₹ 58,26,905.00
		12.3.12 900 mm dia pipe	RMT	867.8			867.8	7060.00	₹ 61,26,668.00
		12.3.13 1000 mm dia pipe	RMT	405.9			405.9	7512.00	₹ 30,49,121.00

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	Total	RMT	6320.1	₹ 3,33,32,790.00
2.3	UADD SOR Vol. 1 Item No. 12.4 Pg. no. 155			
	Labour only for Laying and Jointing non-pressure (NP3)			
	700 mm dia Pipe	RMT	3887.5	₹ 1.00
	800 mm dia Pipe	RMT	1017.8	₹ 1.00
	900 mm Dia pipe	RMT	867.8	₹ 1.00
3.0	MANHOLE			
3.1	UADD SOR Vol. 1 Item No. 17.4 Pg. no. 211			
	Construction of circular type manhole 900 mm internal dia. at bottom, 560 mm dia at top, depth of manhole 900 mm, common Burnt Clay Bricks or fly ash bricks of compressive strength not less than 75 Kgf/cm ² with 1:4 cement mortar (1 cement : 4 coarse sand), inside & outside plastering minimum 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand) finished with a floating coat of neat cement. 20 cm thick foundation in cement concrete 1:3:6 (Nominal Mix) with stone aggregate 40mm nominal size, and making channel in cement concrete 1:2:4 (Nominal Mix) with stone aggregate 20mm nominal size including finishing the channel to shape, including providing and fixing footrest, manhole cover and frame etc. complete. (only excavation as per actual shall be paid separately) fixing of heavy duty (HD-20) SFRC cover and frame as per IS 12592 fixed in Cement concrete 1:2:4 (nominal mix) with stone aggregate 20mm nominal size including centering and shuttering etc. complete as per standard drawing. Depth of manhole shall be considered as the vertical distance from top of the manhole cover to the outgoing invert of main drain channel. (as per Drawing No. - 13-A)			
	Total	Each	21	₹ 1,65,942.00
3.1.1	UADD SOR Vol. 1 Item No. 17.4 Pg. no. 211			
	Extra for increasing depth of manhole mentioned at Item No. 17.4 above 900 mm and up to 1650 mm. (only excavation as per actual shall be paid separately)	Meter	43.4	
	Total			

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3.2	<p>UADD SOR Vol. 1 Item No. 17.5 Pg. no. 211</p> <p>Construction of circular type manhole 1200 mm internal dia. at bottom, 560 mm dia at top, depth of manhole 1660 mm, common Burnt Clay Bricks or fly ash bricks of compressive strength not less than 75 Kg/cm² with 1:4 cement mortar (1 cement : 4 coarse sand), inside & outside plastering minimum 12 mm thick Cement plaster 1:3 (1 cement : 3 coarse sand) finished with a floating coat of neat cement, 25 cm thick foundation in cement concrete 1:3:6 (Nominal Mix) with stone aggregate 40mm nominal size, and making channel in cement concrete 1:2:4 (Nominal Mix) with stone aggregate 20mm nominal size including finishing the channel to shape, including providing and fixing footrest, manhole cover and frame etc. complete. (only excavation as per actual shall be paid separately) fixing of heavy duty (HD-20) SFRC cover and frame as per IS 12592 fixed in Cement concrete 1:2:4 (nominal mix) with stone aggregate 20mm nominal size including centering and shuttering etc. complete as per standard drawing. Depth of manhole shall be considered as the vertical distance from top of the manhole cover to the outgoing invert of main drain channel. (as per Drawing No. - 13-B)</p>	<p>Each</p> <p>31</p> <p>15197</p> <p>₹ 4,71,007.00</p>
3.2.1	<p>UADD SOR Vol. 1 Item No. 17.6</p> <p>Extra for increasing depth of manhole mentioned at Item No. 17.5 above 1660 mm and up to 2300 mm. (only</p>	<p>Meter</p> <p>6210</p>
	<p>Total</p>	<p>Total</p>

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3.3	UADD SOR Vol. 1 Item No. 17.7 Pg. no. 212	Construction of circular type manhole 1500 mm internal dia. at bottom, 560 mm dia at top, depth of manhole 2310 mm in common Burnt Clay Bricks or fly ash bricks of compressive strength not less than 75 Kg/cm ² with 1:4 cement mortar (Cement : 4 coarse sand), inside & outside plastering minimum 12 mm thick Cement plaster 1:3 (1 cement : 3 coarse sand) finished with a floating coat of neat cement, 30 cm thick foundation in cement concrete 1:3:6 (Nominal Mix) with stone aggregate 40mm nominal size, and making channel in cement concrete 1:2:4 (Nominal Mix) with stone aggregate 20mm nominal size including finishing the channel to shape, including providing and fixing footrest, manhole cover and frame etc. complete. (only excavation as per actual shall be paid separately) fixing of heavy duty (HD-20) SFRC cover and frame as per IS 12592 fixed in Cement concrete 1:2:4 (nominal mix) with stone aggregate 20mm nominal size including centering and shuttering etc. complete as per standard drawing. Depth of manhole shall be considered as the vertical distance from top of the manhole cover to the outgoing invert of main drain channel. (as per Drawing No. - 14-A)	Each	171	22635	₹ 38,70,585.00
3.3.1	UADD SOR Vol. 1 Item No. 17.7.1 Pg. no. 212	Extra for increasing depth of manhole mentioned at Item No. 17.7 above depth 2310 mm and up to 4950 mm (only excavation as per actual shall be paid separately)	Total			
3.3.2	UADD SOR Vol. 1 Item No. 17.7.2 Pg. no. 212	Extra for increasing depth of manhole mentioned at Item No. 17.7 above depth 4950 mm and up to 9000mm. (only excavation as per actual shall be paid separately)	Total		13961	
4.0			Total		19080	
FILLING						

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4.1) in trenches, plinth, sides of foundation etc. in the layers not exceeding 20 cm in depth, consolidating each deposited layer ramming and watering, lead upto 50m and lift up to 1.5 m.	CUM						
		Excavated Quantity	CUM				33189.25		
		Pipe Volume	CUM				3264		
		Manhole	CUM	308	0.9	0.9	249		
		For Moraam Bedding	CUM				1267		
		Total Filling required					28409	89	₹ 25,28,399.00
5.0		Painting work							
5.1		Painting with black anti-corrosive bitumastic paint of approved brand and manufacture to give an even shade:							
		Two or more coats on new work.							
		Total	SQM					35	
6.0		Barricading							
6.1	UADD SOR Vol. 3 Item No. 8.20 Pg. no. 64	Red fluorescent with white reflective sleeve traffic cone made of low density polyethylene (LDPE) material with a square base of 390x390x35 mm and a height of 770 mm, 4 kg in weight, as per specifications	each					446	
6.2	UADD SOR Vol. 3 Item No. 8.22 Pg. no. 64	Providing and erecting 2.00 meter high temporary barricading at site: each panel of size 2.50mx2.00m made of 440x40x6 mm angle iron or 50x50x3mm hollow MS tube posts/horizontal members/barcings covered with 1.63mm thic MS sheet. The sheet shall be fied with	RTM					2541	
		Utility Works							
		Emptying of septic tank/ soakage well etc, disposing of sludge within a lead of 5km and taking out sewage including refilling with local earth, ramming and compaction in layers, cleaning of site							
	UADD SOR Vol. 1 Item No. 17.18 Pg. no. 219	Proibiding MS/CI foot rests and fixing in manhole with CC blocks of Cement concrete grade 1:2:4 (Nominal Mix) with stone aggregate 20 mm nominal size of size 30cm x 20cm x 15cm	K/I					30	
	17.18.1	With 20mm square bar / casting one foot rest	K/I					100	
	17.18.2	With 20mm round bar foot rest							
7.0		LOADING AND UNLOADING							

(02)
 Date of work complete
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		REINSTATEMENT					
	<p>Loading & unloading of stone boulders / stone aggregates / sand / moorum. (placing tipper at loading point, dumping with front end loader, dmping,turning for return trip, excluding time for haulage and return trip) : For a lead upto 5 km.</p> <p>Carriage of Material by Mechanical transport including loading unloading & stacing etc. : Earth upto 1 km distance.</p>						
8.0	<p>Construction of granular sub-base by providing Coarse graded material (CBR>30), spreading in uniform layers with motor grader on prepared surface,mixing by mix in place method at OMC and compacting with vibratory rollerof 80-100KN Static weight to achieve the desired density, complete in all respect as per relevant clauses of section-400.</p>	CUM				689	
	<p>Construction of Dry lean cement concrete Sub-base over a prepared sub- grade with coarse and fine aggregate conforming to IS : 383,the size of coarse aggregate not exceeding 26.5 mm, aggregate cement ratio not to exceed 15:1 , aggregate gradation after blending to be as per MORTH Specifications,Table.600-1,cement content.</p>	CUM				3017	
5.1	<p>Construction of dowel jointed, plain cement concrete pavement in M-30 grade concrete over a prepared sub base with 43 or higher grade cement,coarse and fine aggregate conforming to IS : 383 maximum size of coarse aggregate not exceeding 25mm , mixed in a batching and mixing plantas per approved mix design, transported to site, laid with a fixed form or slip form paver with spreading the concrete by shovels ,rakes compacted using needle, screed and plate vibrator and finished in a continuous operation including provision of construction, preparation and final individual items.</p>	CUM	1264.02	0.3	1.5	568.809	5583
	<p>Providing laying, spreading and compacting stone aggregates of specific sizes to Water Bound Macadam including spreading in uniform thickness, hand packing, rolling with vibratory roller 8-10 tonnes, in stages to proper grade and camber, applying and brooming requisite type of screening (Table.400-8).binding Grading-1 (63 to 45mm)</p>						
	(i)						


 10/11/2017
 10/11/2017

	UADD SOR Vol. 2 Item 5.11 page no. 47	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding up to floor level including cost of binding wire, wastage and over laps upto 12mm horizontal /inclined position of reinforcement bars in slab and beams ,plinth, chajjan, lintels, upto 4.5m vertical length of reinforcement in wall columns (over laps shall be provided as per requirement of IS:13920; IS:456&SP : 34) etc. complete.						
	5.11.1	Mild steel and Medium Tensile steel bars.	kg				57	
	5.11.2	Hot rolled deformed bars	kg				58	
	5.11.3	Cold twisted bars	kg				57	
	5.11.4							
	5.11.5	Thermo-Mechanically Treated bars. (Fe 500 D or more)	kg				58	
	5.11.6	Hard drawn steel wire	kg				57	
	5.11.7	Hard drawn steel wire fabric	kg				65	
		Add extra for providing reinforcement above Floor two level for every additional floor or part thereof.						1% of the respective item
	UADD SOR Vol. 2 Item No. 7.1 Pg. no. 65	Random rubble masonry with hard stone in foundation and plinth with Cement mortar 1:6 (1 cement : 6 coarse sand)	Cum				3724	
	UADD SOR Vol. 2 Item No. 6.2 Pg. no. 56	Brick work with well burnt chimney bricks in bulls-patent trench kiln , crushing strength not less than 25kg/ sqcm and water absorption not more than 20% in foundation and plinth						
	6.2.1	Cement mortar 1:4 (1 cement : 4 coarse sand)	Cum				4435	
	UADD SOR Vol. 2 item no. 13.1 pg. no. 160	12 mm cement plaster of mix :						
	13.1.1	1:4 (1 cement -4 sand)	Sqm				149	
	13.1.2	1:6 (1 cement 6 sand)	Sqm				137	
	RUUIDP	Providing 63 KVA Generator set with 2 to 4 nos. of 2000 4250rpm Capacit (minimum total combined capacity 8250rpm) 12 meter headd non -clog Sewage pumps with panel board, Submersible Cable, 150mtr length with a set of quick connect nose coupling for total piping length 180mts. With manpower, consumables, diesel - oil, including operation and maintenance during contract period (for Day night working)						

30.04.2024
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Civil works Estimate for Beautification & Purification of Balwanti River, Badnawar District - Estimate 4						
Civil works Estimate for 3.0 MLD STP						
Estimate prepared as per ISSR of Department of Urban Administration & Development, Government of Madhya Pradesh, in						
S.No	Reference	Item	Unit	Quantity	Rate (Rs. in Lakh)	Amount (Rs. in Lakh)
1	22.15	<p>Sewage Treatment Plant (STP) - Rotating Media Bio Reactor (RMBR)/ Rotating Attached Growth Treatment Plant.</p> <p>1. Screen chamber and grit separator upto 5 MLD capacity are considered as manual type.</p> <p>2. Upto 5 MLD capacity STP, chlorination shall be done by using sodium hypochlorite solution. Above 5 MLD capacity gas chlorinator to be provided.</p> <p>3. Sludge thickener is not provided upto 3 MLD capacity STP, Sludge will be collected into sludge sump & pumped directly to sludge dewatering system.</p> <p>4. For all STP sludge dewatering is using solid bowl centrifuge Or Basket Centrifuge.</p> <p>5. Chlorinator room not considered for STP upto 3 MLD capacity. For STP upto 3 MLD, laboratory & administration building is not considered. Only a room for operator is considered</p> <p>6. Storm water drains, site clearance is not considered in scope.</p> <p>7. All water retaining structures are in M-30 grade of concrete.</p> <p>8. Water table is considered 5 M below GL for design.</p> <p>9. Grade for cement used is OPC 43 grade.</p> <p>10. Grade of steel used is fe 415.</p> <p>11. Peak factor considered for design for plants upto 3 MLD is 3.0, from 4 to 15 MLD is 2.5 & from 16 to 20 MLD is 2.0.</p>				
		<p>Designing, providing, constructing, hydraulic testing, commissioning and giving satisfactorily trials consisting of Wet well including pumping up to inlet chamber, Inlet Chamber, Screen Chamber, Detritus Tanks/ Vortex Grit Separator, Distribution Chamber and RMBR tanks/ Rotating Attached Growth Treatment Plant., Sludge Sump, Chlorine Contact Tank, Chlorinator Room/Shed, Sludge Centrifuge, Pump House, necessary piping work with required valves, gates, drains, pathways, Administration Block cum Laboratory, Laboratory Equipments, Tools and Plants, Spare Parts, etc. complete as turnkey job with all involved civil, electrical and mechanical works inclusive of following items, units as per detailed specifications for civil, electrical and mechanical components with all duties and taxes etc. complete. to achieve BOD < 10ppm, COD < 50ppm, TSS < 10ppm, Total N < 10 ppm and Total P < 1 ppm and Fecal Coliform < 100 MPN/ 100 ml to get recyclable quality of water for industrial / agricultural purposes. (Including 12 Months of Defect Liability Period)</p>				
		UNITS INCLUDED:				

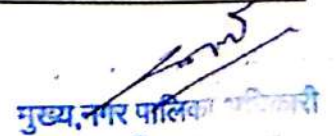
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जिला धार(म.प्र.)

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नगर परिषद, बदनावर
जिला धार (म.प्र.)


1.1		1) Inlet Chamber : Designing , providing, and constructing RCC (M-30) inlet chamber for the peak flow of 2 DWF including necessary excavation in all types of strata including walkway all around the periphery. Each compartment will have phosphor bronze, steel gates with extension rod, head stock, operating wheels, GI pipe railing etc. The work includes providing and making necessary arrangements to connect the flow to screen chamber by approach channel as directed and as per specifications		
1.2		2) Screen Chamber :Designing , providing, constructing, testing and commissioning of screen chamber, designed for average 1 DWF and maximum peak flow of 2 DWF in RCC (M -30), including walkway 1.2 m wide, inlet pipe/ channel from inlet chamber, outlet pipe / channel to detritus tank, free board of 0.5 m minimum, RCC walkway 1.2 m wide with GI pipe railing, RCC stair case of 1.2 m width from GL to screen chamber.		
1.3		3) Detritus Tank : Designing, providing and constructing continuously grit removal type of Detritus Tank, mechanically operated in RCC (M 30) capable of removing 100% 0.2 mm size particle and above, having specific gravity 2.30 designed for one peak 2 DWF with suitable arrangement of separation of grit from putrescible solids including providing, and making necessary arrangements of JB- 1. Inlet and outlet channels of required sizes as make be required to connect the flow to connecting unit etc. Complete including hydraulic testing for water tightness of structure having minimum FB of 0.3 m, wash out arrangement to Grit chamber and platform 1.2 m wide RCC walkway with GI pipe handling shall be provided. A pit for collecting grit conveyed by conveyor shall be provided. It should be suitable to handle the grit for carting. All arrangements shall be as detailed specifications and as directed.		
1.4		4) HYBRID ANAEROBIC REACTOR: in MS/ RCC for removal of Suspended solids and BOD upto 50-60% of incoming load. RMBR Basins: Designing, providing and constructing in RCC mixed (M-30), RMBR basins for biological removal of BOD along with nitrification, denitrification and Phosphorus Removal. The RMBRs shall be complete with RMBR drums of Polypropylene in Mild Steel framework, plummer blocks, geared motor, Variable Frequency Drive (VFD) if needed, PP media etc complete, along with a Bio Film Separator ANOXIC REACTOR with attached growth media of PVC fills for Nitrogen removal. Tank of MS/ RCC M30		



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मुख्य, नगर पालिका अधिकारी
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1.5	5) Chlorine Contact Tank: Designing providing and constructing chlorine contact chamber of adequate capacity to deal with 11DWP average flow. The chlorine contact tank should be of 30 min capacity, during average flow to achieve 99.99 % coli form reduction. Chlorine dose shall be maintained as per standard provisions, including designing, providing and constructing water supply provision for chlorination, including providing dewatering and by pass arrangement jointing to final effluent mains and outlet weir etc complete. The effluent quality should match with the standards laid down by the department, as per obligatory provision, as detailed specification and as directed by engineer in - charge. OR Ozonator of adequate capacity complete with Ozone generator, Air drier and O2 concentrator	
1.6	6) Chlorinator and Chlorinator Room/Tonner Room: Designing, providing and constructing chlorinators vacuum type 2 Nos, with auto switchover facility and having capacity for dosage of adequate chlorine to ensure 99.99 % coliform reduction as per per obligatory provisions and detailed specifications with necessary provision of having chlorinator room of adequate size. The chlorinator equipment shall include cost of chlorine cylinders/tonner, piping, valves, measuring and controlling equipment, safety devices, lifting equipment's, etc. complete as per IS -10553 (part II) 1982. The tonner room should have minimum 3 MT capacity crane for loading and unloading facility. Tonner storage should be distinctly isolated and should be for minimum storage space as directed in the design specification and as per gas laws 1981 and factory act shall be provided. All other matching amenities shall be provided, 5 MT gantry rail shall be provided for full length of tonner room at 6 m height from level of tonner room, with outlet chamber and treated effluent outlet channel etc. Complete as per detailed specification. (Chlorinator and Chlorinator Room/Tonner Room Not required if ozonator is provided)	
1.7	7) Sludge Sump: Designing, providing and constructing of sludge sump and pump house of appropriate size with pumps, ceiling height minimum 6 m over sump for discharging sludge to centrifuge and recycling of flow for blending of sludge using CI pipe complete as per detailed specification.	


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1.8		8) Sludge Centrifuge Platform with Centrifuges: Designing, providing, constructing and installing including foundation etc. sludge centrifuge to handle the sludge flow of 1 day in 20hours per unit with sludge dewatering unit drain etc complete as per specification sludge centrifuges with the necessary arrangement as per detailed specification mentioned in tender and obligatory provisions to be provided with satisfactory functioning.			
1.9		9) Outfall Sewer: Designing, providing and constructing appropriate outfall sewer of RCC NP2 pipe, to discharge treated effluent, untreated effluent from outlet chamber (after SBR basin/ chlorination tank) to the local Nallah at the point shown on the drawing including necessary chambers for inspection and cleaning including necessary excavation, dewatering, refilling, concrete encasing/bedding concrete steps to reach the nallah bed level, pitching and energy dissipation chamber in nallah portion etc. complete upto 50 m length RCC NP2 pipe line and including all above items.			
1.10		10.) Pining work in CI - LA class including Sluice valves, Reflux Valves, MS Gates: Providing laying and jointing pipes other than those already included in the above items for interconnection by - pass drains etc. of all units including adequate numbers of manhole chambers. The item includes excavations, refilling and hydraulic testing of pipes, valves, gates, accessories and cost of jointing materials. The items includes required channels with gates for interconnection of units by pass drains etc for all units as directed etc complete as per detailed specifications			
1.11		11. Administrative Building cum Laboratory (G+1)			
		Administrative Building cum Laboratory, single storied Porta cabin / Brick and mortar construction of total carpet area of minimum 300 sqft: Designing, providing and constructing administrative building, office cum Laboratory including stores. Aluminum door and window with glass panels and all other allied items, fixtures fastening electrification arrangement water supply arrangement etc complete. The building should be so centralized that it should not be attached with any unit but should have complete control of every unit as per laboratory equipment, beautification, telephone and intercom arrangement and wireless system. Scope also includes construction of boundary wall.			
	22.15.1	Cost of 1 MLD	MLD	240.00	
	22.15.2	Add per MLD above 1 MLD upto 2 MLD	MLD	90.00	
	22.15.3	Add per MLD above 2 MLD upto 5 MLD	MLD	90.00	
	22.15.4	Add per MLD above 5 MLD upto 10 MLD	MLD	87.00	
	22.15.5	Add per MLD above 10 MLD upto 15 MLD	MLD	84.00	
		For 3 MLD			410.00
		Revised UAdd Sor Revision no.			
		TOTAL AMOUNT (Rs. in Lakh)			410.00

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नगर परिषद, बदनावर
जिला धार (म.प्र.)

Civil works Estimate for Beautification & Purification of Balwanti River, Badnawar District - Dhar [M.P.] Estimate No. 5										
Civil works Estimate for Retaining Wall										
Estimate prepared as per ISSR of Department of Urban Administration & Development, Government of Madhya Pradesh, in force from - 2 nd August 2021 - (VOLUME II) Building Works										
Sr. No.	Specifications of Item	SOR page no./sr.no.	No.	Length	Width	Depth/ Height	Total quantity	Unit	Rate (in INR)	Amount
Earth Work										
1.0	Surface Dressing of the ground including removing vegetation and in equalities not exceeding 15 cm deep and disposal of rubbish, lead upto 50m and lift upto 1.5m complete area	17 / 2.1	1.0	200.0	2.6		520.0	/100Sqm	1003.00	₹ 5,216
	Total Surface Dressing						5.2			
1.1	Earth work in excavation for foundation, trenches for pipes / cables or drains etc. by mechanical means / manual means (exceeding 30cm in depth.) including ramming of bottom, dressing of sides, disposal of excavated earth including of all lift and lead upto 50m. Disposed earth to be levelled and neatly dressed.	17 / 2.6.1								
1.2	In or under water and/or liquid mud, including pumping out water as required. (All water that may accumulate in excavations during the progress of the work from seepage, (not due to the negligence of the contractor), shall be bailed, pumped out or otherwise removed. The contractor shall take adequate measures for bailing and/or pumping out water from excavations and/or pumping out water from excavations and construct diversion channels, bunds, sumps, etc (20% extra of the rate of each item. The extra percentage in rate is applicable, to quantities of,	19/2.15.1								


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Excavation for Foundation Raft										
Key										
Total Excavation										
	1.0	200.0	2.6	1.6	832.0					
	1.0	200.0	0.4	0.3	24.0					
	cu.mt.									181.20
										₹ 1,55,107
1.3	Filling by available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.	19/2.16								
	Filling over Raft	1.0	200.00	2.60	1.20	624.00				
	Deduction for Wall	-1.0	84.00			-84.00				
	Total Filling					540.00			89.00	₹ 48,060
1.4	Supplying and filling in plinth under floors including, watering, ramming consolidating and dressing complete.	19 / 2.18								
	Moorum/Hard copra	19/2.18.1								
	Below Foundation Raft	1	200.00	2.60	0.30	156.00				
	Total Filling					156.00			478.00	₹ 74,563
	Total									₹ 2,82,951
2.0	Cement Concrete									
2.1	Providing and laying in position Cement Concrete of specific grade, excluding the cost of shuttering & centering. All works up to plinth level.	32/4.2/ 4.2.2								
	Cement concrete grade M-20 (Nominal Mix) with 20 mm maximum size of stone aggregate)		1	200.0	2.60	0.10	52.00			
	PCC for Raft									
	Total PCC					52.00			5417.00	₹ 2,81,684
	Total									₹ 2,81,684
3.0	Reinforced Cement Concrete									

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जिला धार (म.प्र.)

<p>3.1 Providing and laying in position machine batched and machine mixed and machine vibrated design mix cement concrete of M-25 grade mixed in a concrete mixer of not less than 0.2 cum capacity and appropriate weigh batcher using approved mix design, for reinforced cement concrete work including pumping of concrete to site of laying but excluding the cost of centering, shuttering, finishing and reinforcement. including Admixtures in recommended proportions as per IS 9103 to accelerate, retard setting of concrete, improve workability without impairing strength and durability as per direction of Engineer-in-charge. Upto Plinth Level</p> <p>49 / 5.21.1</p>										
	For Raft Foundation									
	Base	1	200.0	2.30	0.30	138.00				
	Key	1	200.00	0.40	0.30	24.00				
For Wall Below GL										
Wall @ thickness 400 mm at bottom and 300 mm at GL Avg width = $0.4 + 0.3/2 = 0.35$	1	200.00	0.35	1.20	84.00					
Total RCC in Below GL					246.00					
					cu.mt.	5547.00				₹ 13,64,562

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3.2	Providing and laying in position machine batched and machine mixed and machine vibrated design mix cement concrete of M-25 grade mixed in a concrete mixer of not less than 0.2 cum capacity and appropriate weigh batcher using approved mix design, for reinforced cement concrete work including pumping of concrete to site of laying but excluding the cost of centering, shuttering, finishing and reinforcement including Admixtures in recommended proportions as per IS 9103 to accelerate, retard setting of concrete, improve workability without impairing strength and durability as per direction of Engineer-in-charge. Above Plinth Level	49 / 5.21.2	1	200.00	0.25	3.00	150.00	5701.00	₹ 8,55,150	
				Avg width = 0.3+0.2/2=0.25						150.00
3.3	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding upto floor level including cost of binding wire, wastage and over laps upto 12mm horizontal/ inclined position of reinforcement bars in slab and beams, plinth, chajjas, lintels, upto 4.5m vertical length of reinforcement in wall columns (over laps shall be provided as per requirement of IS : 13920; IS 456 & SP : 34) etc. complete.	47/5.11		246.00	100.00		24600.00	58.00	₹ 24,83,850	
				150.00	122		18225.00			
			Thermo Mechanically Treated bars (Fe 500 D or more)				42825.00			₹ 47,03,562
			For Foundation Raft @ 100 Kg per cubic meter							
			For Wall @ 122 Kg per cubic meter							
			Total Reinforcements in RCC							
			Total							

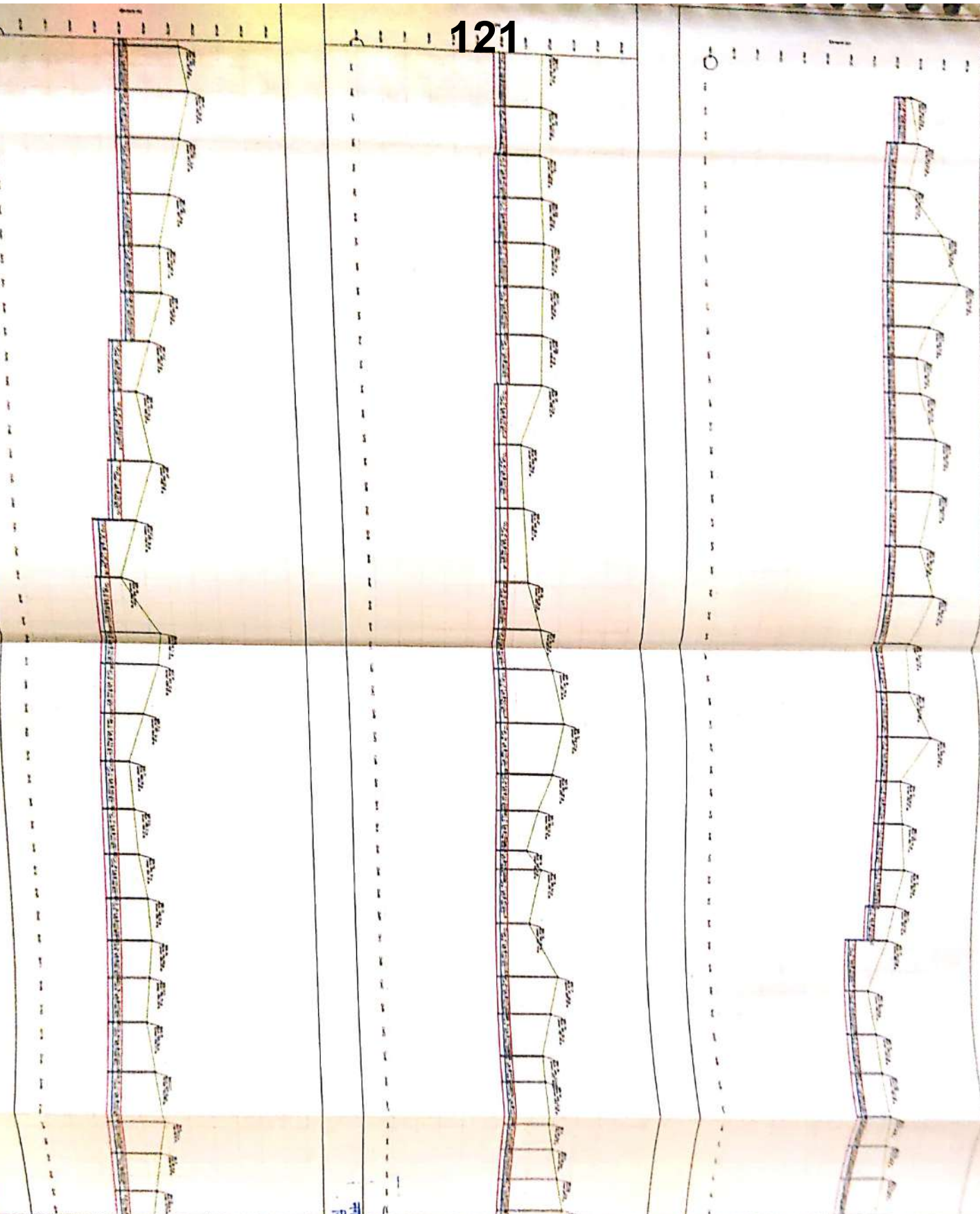
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जिला धार (म.प्र.)

Finishing									
4.0	15 mm cement plaster in two coats under layer 12 mm thick cement plaster 1:5 (1 cement 5 coarse sand) and a top layer 3 mm thick cement plaster 1:3 (1 cement 3 coarse sand) finished rough with sponge.	100 / 13.11	0	200.00	3.00	0.00	sq. mt.	22.4.00	₹ 0
Total Area of External plaster							sq. mt.	80.00	₹ 0
4.2	Finishing wall with deluxe multi surface paint system for interiors and exteriors using primer as per manufacturers specifications Two or more coats applied @ 1.25 ltr/ 10 sq.m. over and including one coat of special primer applied @ 0.75 ltr / 10 sq.m.	164 / 13.46					sq. mt.	Total	₹ 0
Total Painting area in plaster							sq. mt.	80.00	₹ 0
Formwork									
5.0	Centering and shuttering including struttings, propping stretching etc. complete for and removal of form work by sheet plate or ply wood shuttering for : Foundations, footings, bases of columns, etc. for mass concrete.	208 / 19.1					sq. mt.	160.00	₹ 25,000
5.1	Total sides of the footings For Foundation Raft	208 / 19.1.1	2	200.00	0.40		sq. mt.	160.00	₹ 25,000
5.2	Centering and shuttering including struttings, propping stretching etc. complete for and removal of form work by sheet plate or ply wood shuttering for : Walls (any thickness) including attached pilasters, buttresses, plinth and string courses etc	208 / 19.1.6	2	200.00	4.20		sq. mt.	168.00	₹ 26,880
Total Formwork in Walls							sq. mt.	168.00	₹ 26,880
Total Cost in Rs.							Total		₹ 51,880
Total Cost in (Rupees)							Total		₹ 51,880

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L-section Trunk Line of Badnawar, Dhar Madhya Pradesh



L-section Trunk Network

DATE	20/05/2019	PAGE	1
SCALE	AS SHOWN	PROJECT	L-section Trunk Network
DESIGNER	PROF. A. K. SINGH	CHECKED	PROF. A. K. SINGH
DRAWN	PROF. A. K. SINGH	DATE	20/05/2019

CLIENT: *A. K. Singh*
PROFESSOR (CIVIL ENGRG.)
UNANI ENGINEERING COLLEGE
(UNANI, I.I.T.)

CONSULTANT:

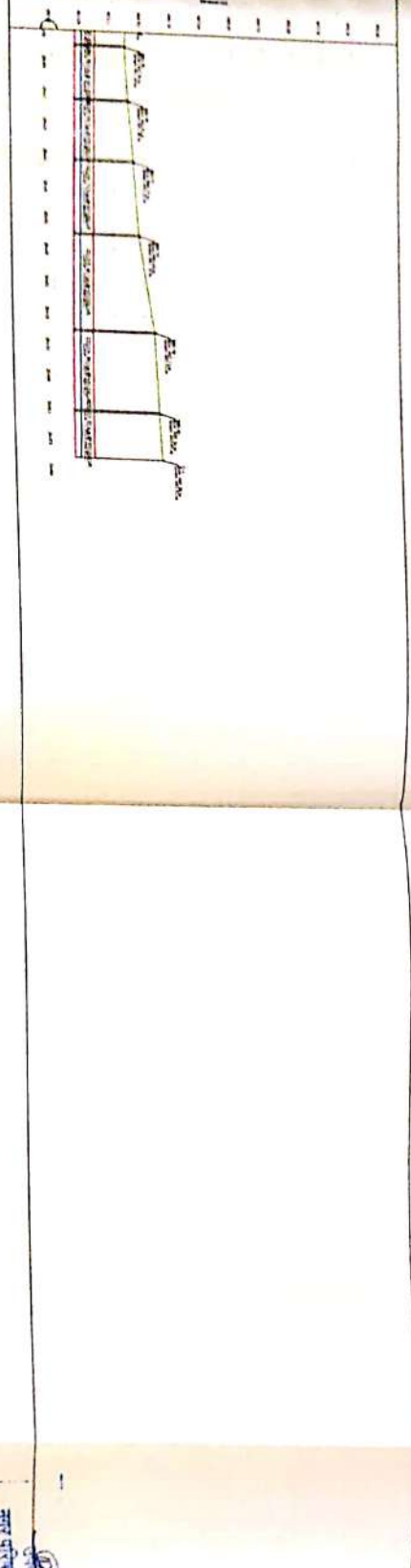
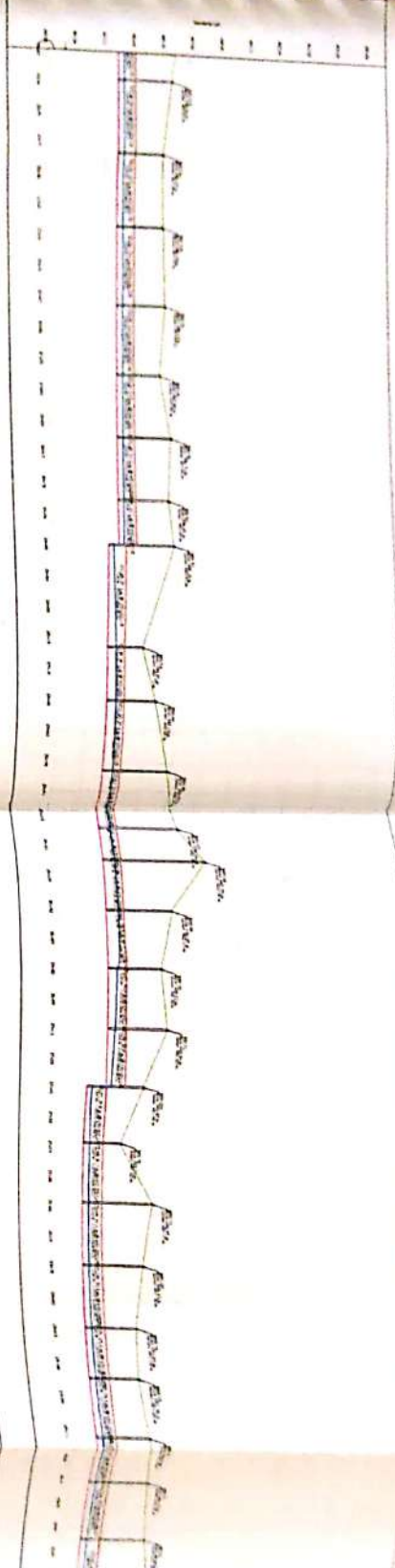
PROF. A. K. SINGH
 प्रा. अ. क. सिंघ
 फोरम (ए. ई.)

PROF. A. K. SINGH
 प्रा. अ. क. सिंघ, प्रोफेसर
 फोरम (ए. ई.)

Drawn Design Check Approved

Drawing No. -

L-section Trunk Line of Badnawar, Dhar Madhya Pradesh



Page No. 122

L-section Sewer Network

Sl. No.	Description	Quantity	Unit
1	Manhole	1	nos
2	Pipe	1	nos

Sl. No.	Description	Quantity	Unit
1	Manhole	1	nos
2	Pipe	1	nos

प्रो. अशोक कुमार
फोरम (म.प्र.)

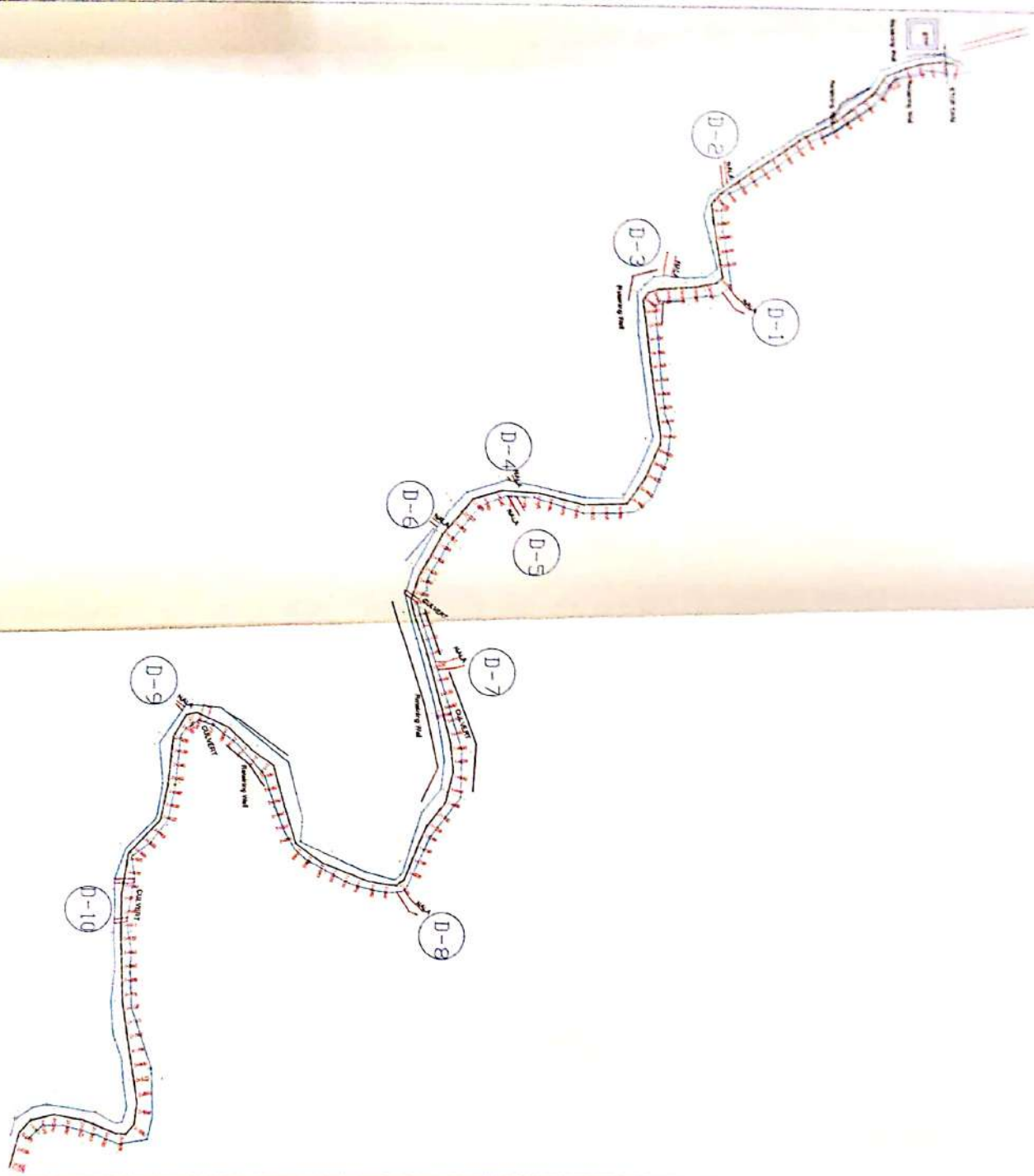
प्रो. अशोक कुमार
फोरम (म.प्र.)

CLIENT: *Anshu*
PROFESSOR (CIVIL ENGG.)
WAPIN ENGINEERING COLLEGE
WAPIN (M.P.)

CONSULTANT:



Drawn Design Check Approved
Drawing No. -



Project Title:
 Rejuvenation and
 Beautification of River
 Baramati at Badnawar
 Municipal Area

TITLE:-
 L-Section Sewer Network

LEGENDS

SNO	DESCRIPTION	SYMBOL
1	Riser Section	○
2	Manhole	⊙
3	Detail	△
4	Receiving Well	□
5	Draw (D)	—
6	Stop Box	—
7	STP	□

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 विता एअर (म.प.)
 नगर परिषद, बदनावर
 विता एअर (म.प.)

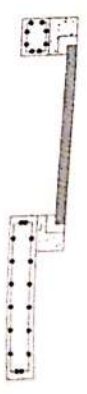
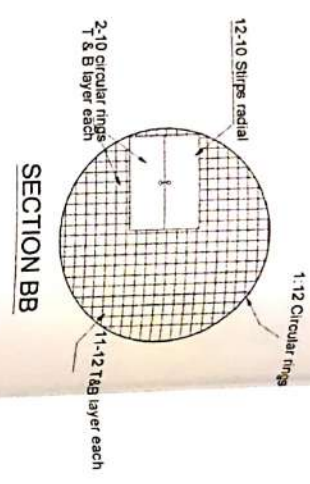
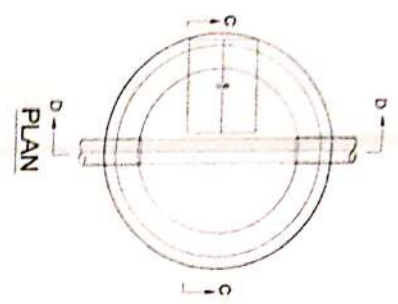
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 PROFESSOR (CIVIL ENGG.)
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 Umrutkashi Bldg,
 Nagar Parishad, Badnawar

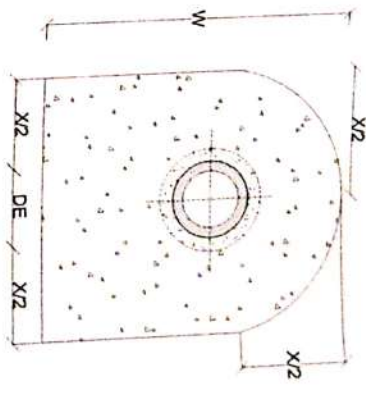
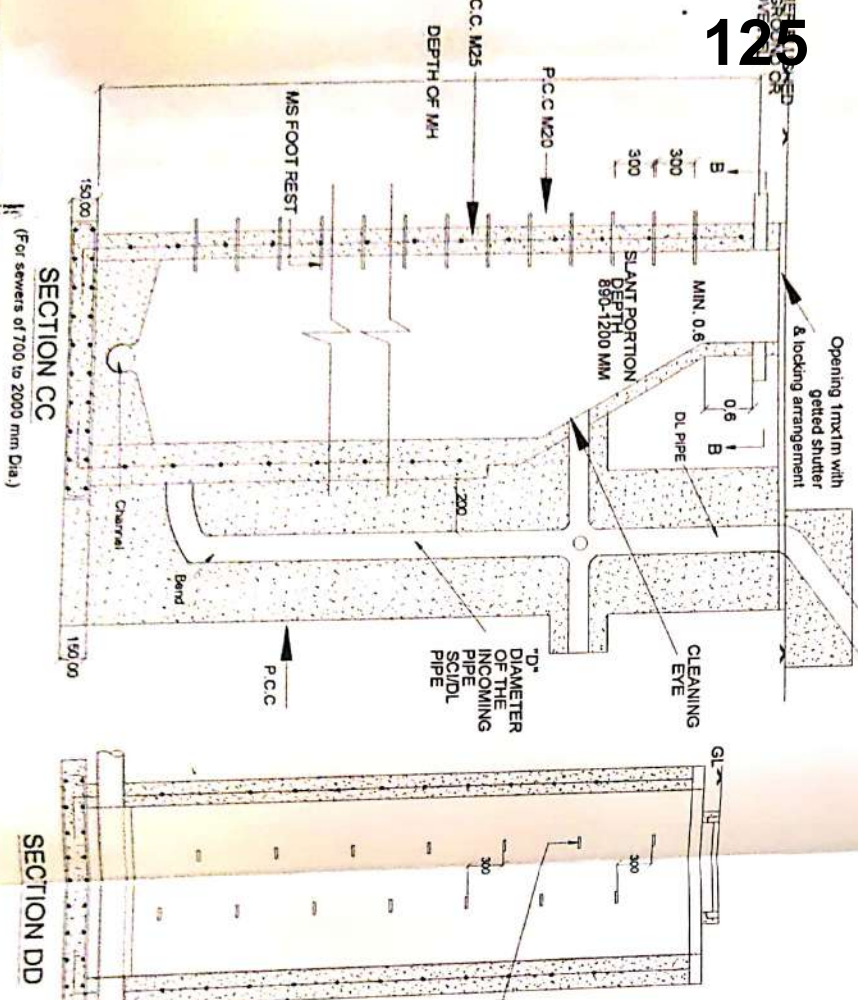
CONSULTANT :
 Eco & Environmental
 Environmental
 Services

Drawn Design Check Approved
 Drawing No. - Badnawar/ID/007

DRAWING FOR RCC SPECIAL TYPE MANHOLE (WITH DROP CONNECTION AND HIGH FLOOD PROTECTION SYSTEM)



125



NOTE
 X=40 FOR DEPTH UP TO 1.2 M
 X=40 CM FOR BEYOND 1.2 M
 CONCRETE AROUND HAUNCHES TO BE PROVIDE FOR
 LINES LIKELY TO BE EFFECTED DUE TO HIGH FLOOD

TABLE

Outgoing sewer in manhole	Dia (d) mm	900	1000	1200	1400	1600	1800	2000
Manhole internal Dia (MH ID) in mm	MH ID (in mm)	1500	1500	1750	2000	2200	2300	2500
Circumferential reinforcement in wall	0-3.5m Depth	#10 @ 250 c/c	#10 @ 250 c/c	#10 @ 250 c/c	#10 @ 250 c/c	#10 @ 250 c/c	#10 @ 250 c/c	#10 @ 250 c/c
Reinforcement in wall	0-3.5m Depth	#10 @ 140 c/c	#10 @ 140 c/c	#10 @ 140 c/c	#10 @ 140 c/c	#10 @ 140 c/c	#10 @ 140 c/c	#10 @ 140 c/c
Base slab	0-3.5m Depth	Top layer	Bottom layer	#12 @ 120 c/c both ways	#10 @ 200 c/c both ways	#10 @ 200 c/c both ways	#10 @ 200 c/c both ways	#10 @ 200 c/c both ways

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 CIVIL ENGINEER
 PUNJAB ENGINEERING COLLEGE
 PATIALA (P.N.)



30/A MAHARAJI NAGAR MAIN ROAD
 PHOENIX COLONY
 PATIALA (P.N.)
 PHONE NO. 9711-6095172

Drawing No. - Badnawar/ID/009
 Scale: 1/15

Project Title
 Rejuvenation and Beautification of River
 Badnawar at Badnawar Municipal Area dist
 Dhar (M.P.)

Sub Project Title
 Draft Detailed Project Report for
 Rejuvenation and Beautification of River
 Badnawar at Badnawar Municipal Area dist.
 Dhar (M.P.)

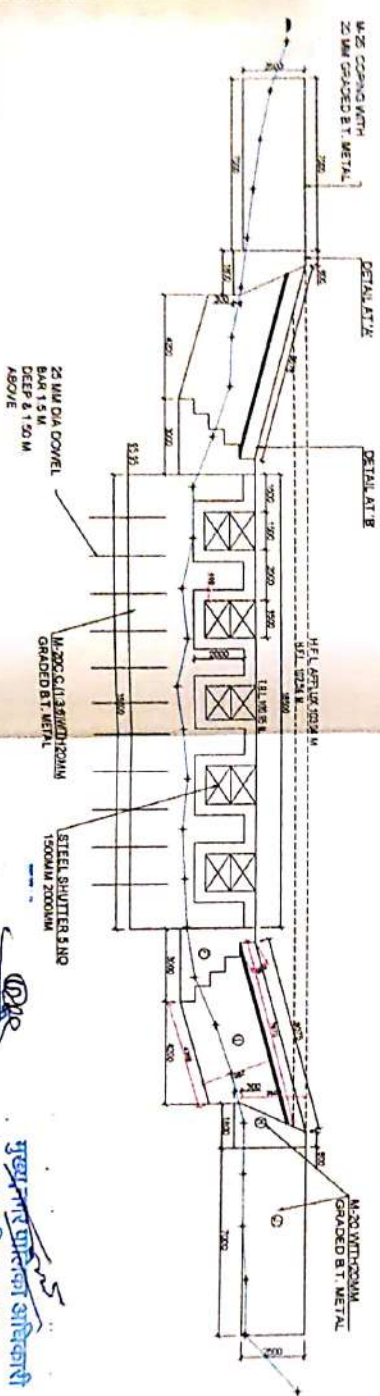
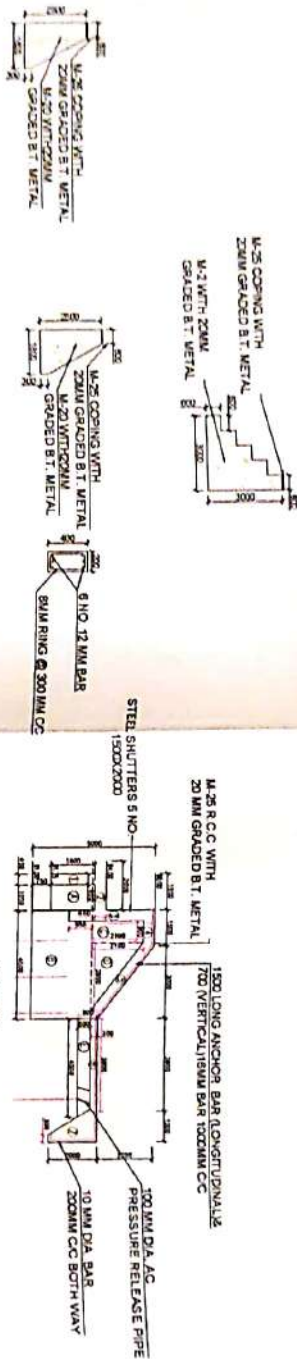
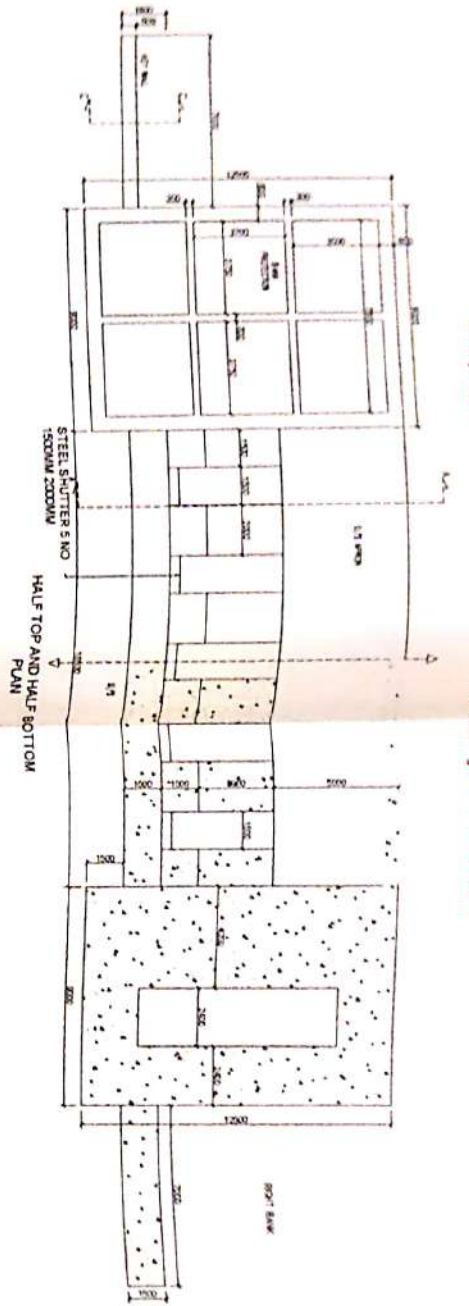
Typical Details:
 Drawing for RCC MANHOLE

CLIENT:
 Municipal Council Badnawar

TITLE :-
 Drawing for Sewer Laying

DATE :-
 15/07/2024

PROFESSOR (CIVIL ENGRG.)
 RAJESH K. SHARMA
 CIVIL ENGINEER



02 04 06 08 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54

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जिल्हा धार (प.प.)
नगर परिवार, बदनावर
जिल्हा धार (प.प.)



गुण्य नगर विकास अधिकारी
नगर परिवार, बदनावर
जिल्हा धार (प.प.)

Project Title
Reveneration and Beautification of River
Balswari at Badnawar Municipal Area dist.
Dhar (M.P.)

Sub Project Title
Draft Detailed Project Report for
Reveneration and Beautification of River
Balswari at Badnawar Municipal Area dist.
Dhar (M.P.)

Typical Details:
Stop Dam

CLIENT:
Municipal Council Badnawar

TITLE :- Stop Dam

DATE :- 11/08/2024

PROFESSOR (CIVIL ENGINEER)
DIPAN KUMAR SINGH

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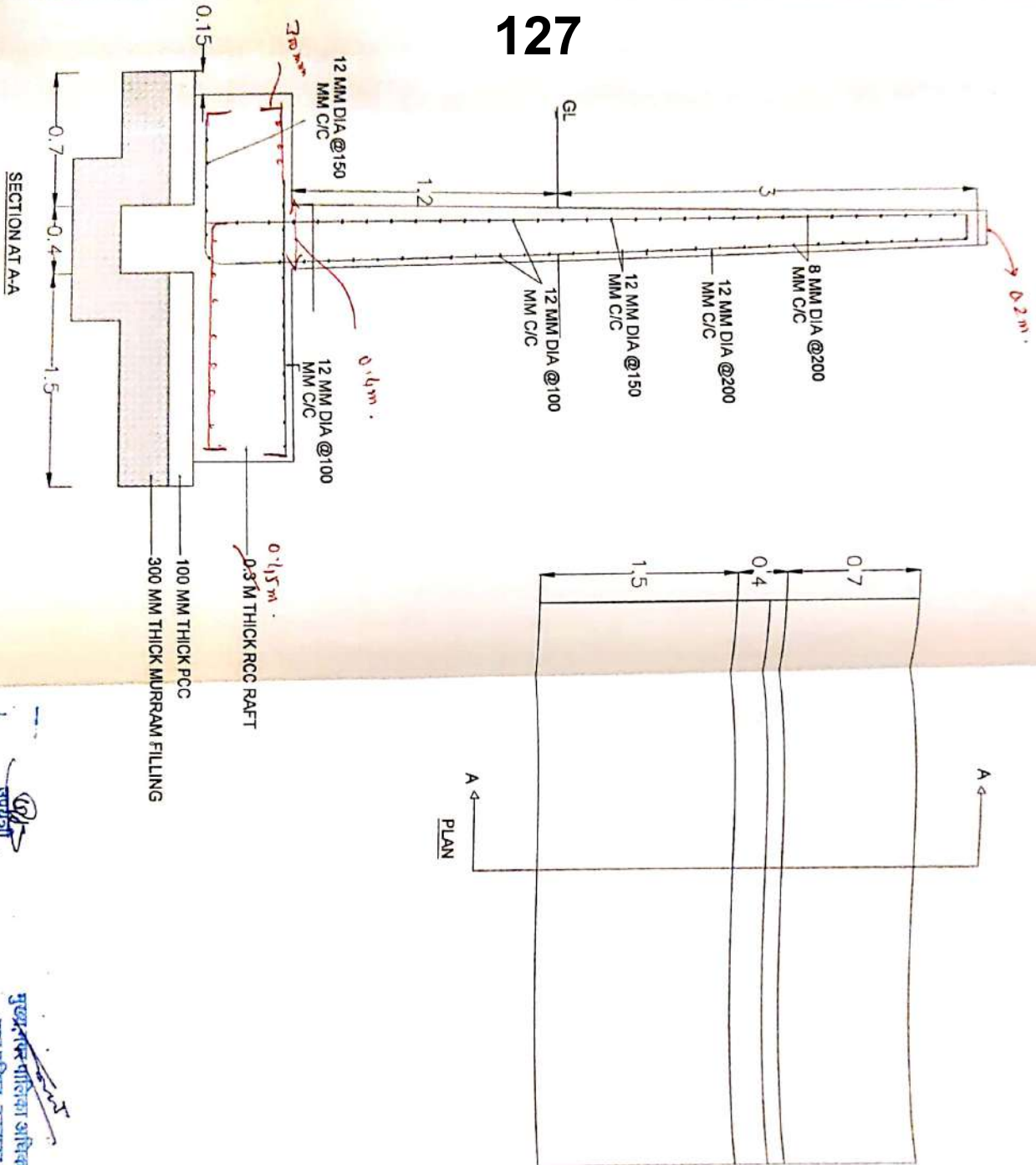
363-A, MAHALAXMI NAGAR MAIN ROAD, CHANDORE
PHONE No. 0731- 4655172

Drawn [Signature] **Design** [Signature] **Checked** [Signature] **Approved** [Signature]

Drawing No. - Badnawar/ID/001
Scale: 1:25

Retaining wall of Balwanti River at Badnawar, Dist-Dhar (Madhya Pradesh)

127



गणेश
शरदजी
शार परियोजना मन्तव्य
जिला धार (म.प्र.)

मुद्रांकित परियोजना अधिकारी
शार परियोजना मन्तव्य
जिला धार (म.प्र.)

Project Title
Rejuvenation and Beautification of River Balwanti at Badnawar Municipal Area Dist Dhar (M.P.)

Sub Project Title
Draft Detailed Project Report for Rejuvenation and Beautification of River Balwanti at Badnawar Municipal Area Dist Dhar (M.P.)

Typical Details:
Retaining Wall

CLIENT:
Municipal Council Badnawar

TITLE :- Retaining Wall

DATE :- 10/11/2023
PROFESSOR (CIVIL ENGINEER)
UPPER ENGINEERING COLLEGE
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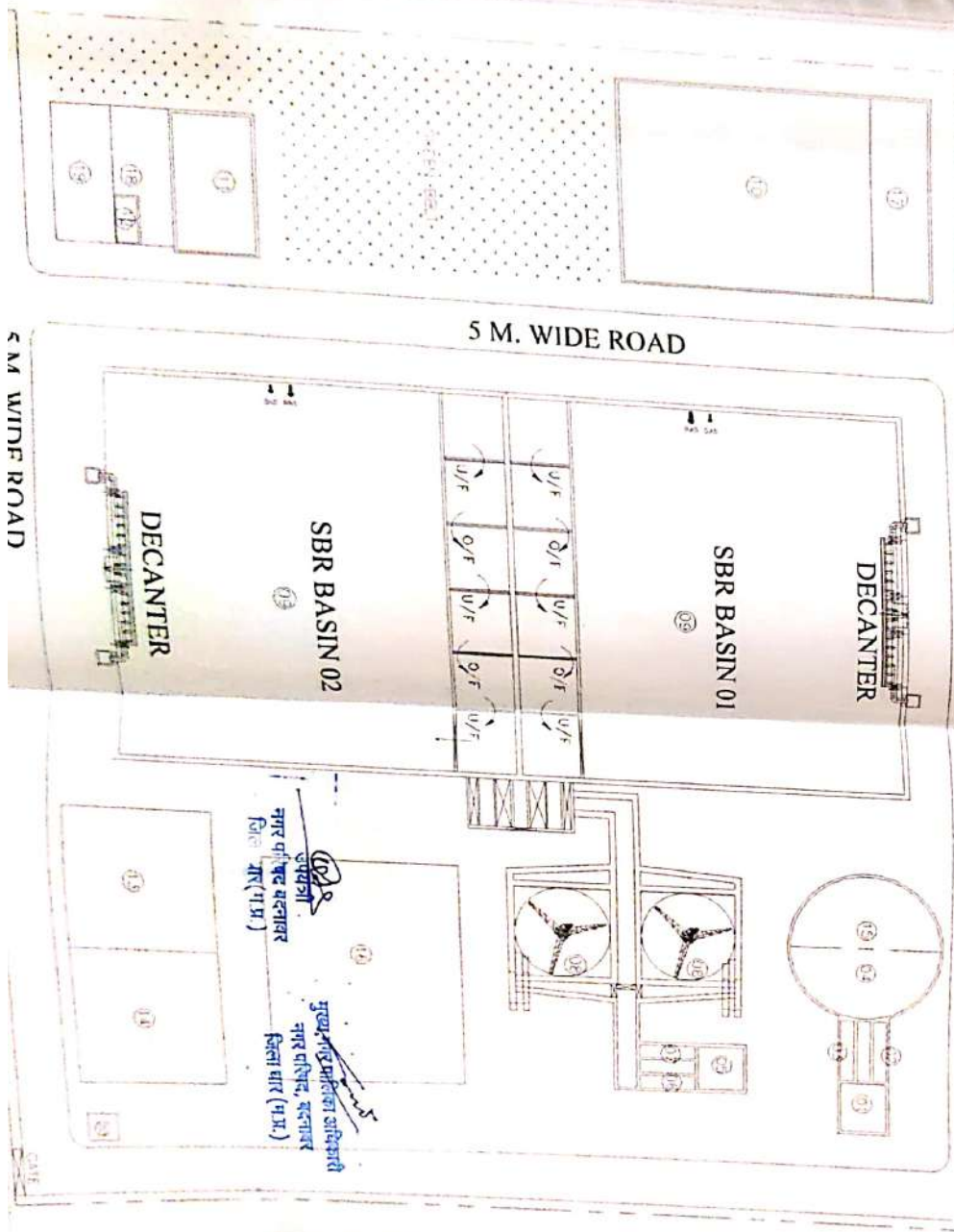
Eco Pro
Services
Environmental

36/A MAHATMA NAGAR MAIN ROAD, INDORE
PHONE NO: 0731-4925172

Drawing No - Badnawar/1D/002
Scale: 1:75

Drawn: N
Design: SJ
Checked: AJ
Approved: AV

EQUIPMENT LIST		BUILDS LIST	
Sl. No.	DESCRIPTION	QTY	REMARKS
01	1.25 M ³ / HOUR	01	
02	1.25 M ³ / HOUR	01	
03	1.25 M ³ / HOUR	01	
04	1.25 M ³ / HOUR	01	
05	1.25 M ³ / HOUR	01	
06	1.25 M ³ / HOUR	01	
07	1.25 M ³ / HOUR	01	
08	1.25 M ³ / HOUR	01	
09	1.25 M ³ / HOUR	01	
10	1.25 M ³ / HOUR	01	
11	1.25 M ³ / HOUR	01	
12	1.25 M ³ / HOUR	01	
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18	1.25 M ³ / HOUR	01	
19	1.25 M ³ / HOUR	01	
20	1.25 M ³ / HOUR	01	



Project Title
 Rejuvenation and Beautification of River
 Bahdar at Badnawar Municipal Area dist
 Dhar (M.P.).

Typical Details:
 Drawing for Sewer Laying work

CLIENT:
 Municipal Council Badnawar

TITLE :-
 General Layout of STP

DATE :-
 10/01/2024

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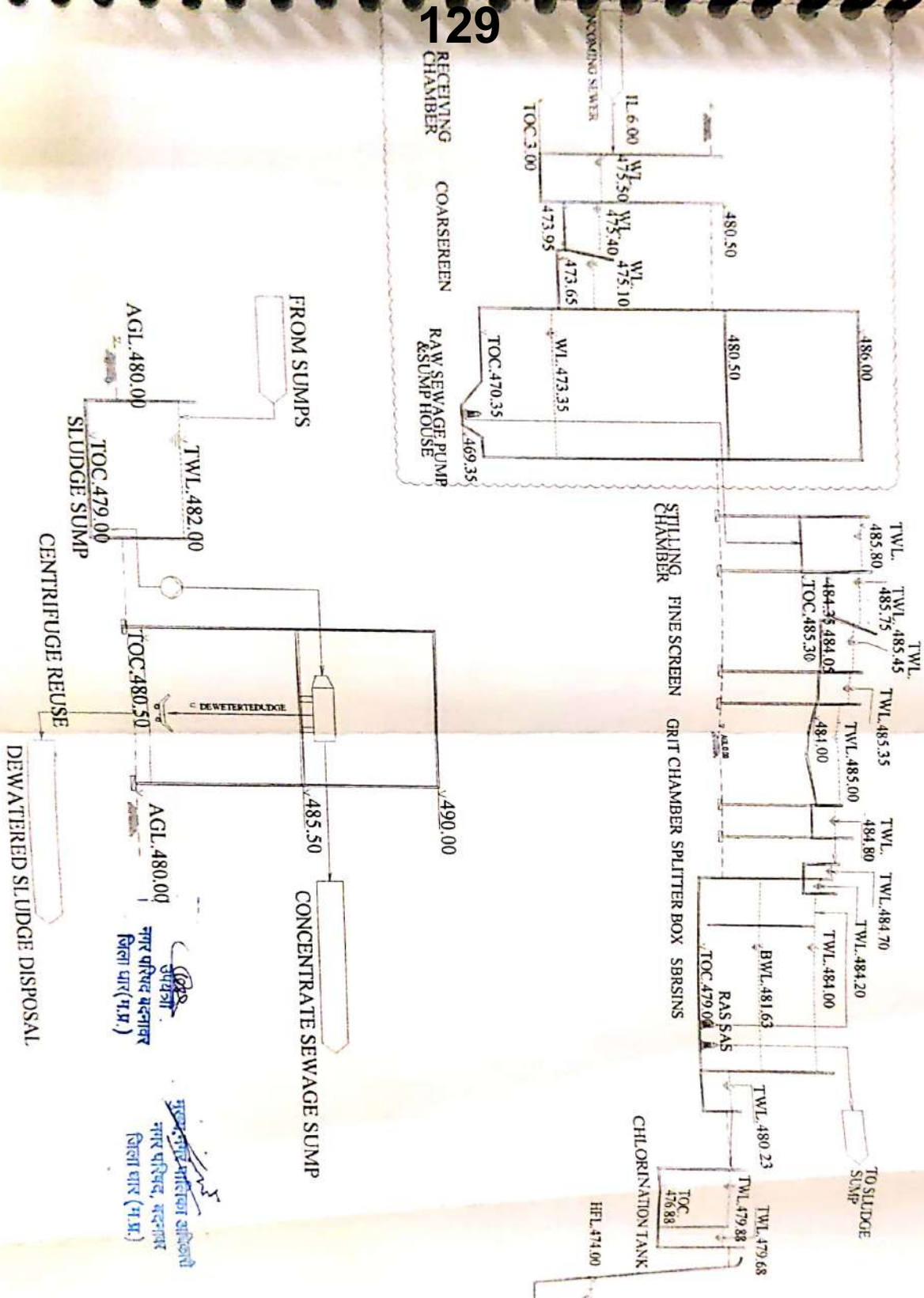
Eco Pro Environmental Services

30/A, MAHATMA JI NAGAR MAIN ROAD,
 PHONE NO. 0731-4065172

Drawn: SJ, Design: SJ, Checked: AJ, Approved: AW

Drawing No: Badnawar/ED/0010
 Scale: 1:25

CO-OP ENVIRONMENTAL SERVICES
 D.H. KHANDELKAR
 D.H. KHANDELKAR
 D.H. KHANDELKAR



Project Title
 Rejuvenation and Beautification of River
 Balwari at Badnawar Municipal Area dist
 Dhar (M.P.)

Typical Details:
 Drawing for Sewer Laying work

CLIENT:
 Municipal Council Badnawar

TITLE :-
 Hydraulic Flow Diagram of STP

DATE :- 27/11/2024

PROFESSOR (CIVIL ENGG.)
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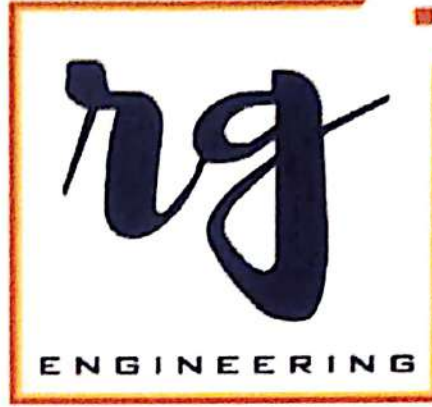
Drawn SJ
Design SJ
Checked AJ
Approved ZW

Drawing No. - Badnawar/ID/0011
 Scale: 1:15

GEOTECHNICAL INVESTIGATION REPORT FOR CONSTRUCTION OF ANICUT ACROSS
BALWANTI RIVER AT BADNAWAR, DISTT: - DHAR (MP)

CLIENT: - NAGAR PALIKA BADNAWAR

CONSULTANT: - M/S ECOPRO ENVIRONMENTAL SERVICES, INDORE (M.P.)



AN ISO 9001:2015 CERTIFIED COMPANY



RAJMI GEOEXPLORATION & ENGINEERING PVT. LTD

Consultancy Services For:-

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Reg. office: 106-109, M.L Tower 292-A, Scheme No. 91 near Malwa Mill Square Indore, Madhya Pradesh. 4520001.

Email: rajmigeoexploration@gmail.com

Land Line: 0731 2434588

Cell No: +919926845588, +919425460588, +919826645588, +919977035888


उपयंत्री
नगर परिषद बदनावर
जिला धार(म.प्र.)



मुख्य नगर पालिका अधिकारी
नगर परिषद, बदनावर
जिला धार (म.प्र.)


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2	• 2.0 Aims & Scope of Investigations • 2.1 Field & Lab Tests	5
3	• 3.0 Discussions	6
4	• 4.0 Computation of Safe Bearing Capacity	6
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6	• 6.0 References	11

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S. No.	Particulars	Page No
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जिला धार (म.प्र.)


मुख्य जगर प्रालिका अधिकारी
नगर परिषद, बदनावर
जिला धार (म.प्र.)

CERTIFICATE

We here by certify that Geotechnical Investigation for the construction of Anicut across Balwanti river at Badnawar, Distt:- Dhar (MP), was conducted by us as per the Soil & Rock Samples extracted one borehole and submitted by the contractor. This report consists of 12 pages (including the cover page).


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जिला धार(म.प्र.)


मुख्य, नगर पालिका अधिकारी
नगर परिषद, बदनावर
जिला धार (म.प्र.)



Authorized Signatory

Rajmi Geoexploration & Engineerig. Pvt. Ltd Indore

1.0 INTRODUCTION

The subject of load bearing capacity of soils is of great importance to Engineers who have to design foundations for buildings and structures which are heavy, large and tall. Such structures are required to be put to meet the varying requirements which have come about in the work of substantial. More important the structure is, greater is the need to give attention to design and construction of its foundation.


The design and construction of foundation of heavy structure is not an easy task. It calls for ability and experience. The most important factor which influences design of foundations is the load bearing capacity of soils met with. Therefore, in arriving at the safe load bearing capacity of soils, the properties and characteristics of the soil at site is required to be determined.

It has many times been experienced that not only the design of foundation is difficult task, the pre-requisite for which are the proper site investigation, field test and laboratory testing, but the actual construction of foundation also poses difficult problems. It is, therefore necessary to conduct the detail investigations at site before a design can be finalized. The object of subsurface and related site investigations is to provide the engineer / Architect with as much information as possible about the existing conditions, for example, the exposed overburden, the course of a stream nearby, a rock outcrop or a hillock, vegetation and other geological features of the area. It is equally important to know the sub soil conditions below a proposed structure.

The methods of sub surface investigation enable vertical sections of the strata to be drawn and samples to be tested, on the site or in a laboratory for determining shear strength parameters, bearing capacity of the soils, permeability, water table, type, classification and other geophysical information in the field. This information together with the normal topographical survey provides the Engineer with complete details of the site and enables him to know the complexity of natural deposits. No one method of exploration is best for all situations. Site reconnaissance would help in deriving program of field investigations that is to assess the need for preliminary or detailed investigations.

Nagar Palika, Badnawar has proposed the construction of Anicut across Balwanti River at Badnawar , Dist:- Dhare. **M/S Ecopro Environmental Services, Indore (M.P.)** has been awarded the work of consultancy. The Consultant has arranged the drilling agency for exploration of soil/rock samples from one borehole. They have explored borehole at one location. The rock samples extracted from the borehole have been duly arranged in the core boxes and have been submitted in the laboratory of **Rajni Geoexploration & Engg. Pvt. Ltd.** The Geological


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मुख्य नगर पालिका अधिकारी
नगर परिषद, बदनार
जिला धार (म.प्र.)

classifications and conduction of suitable tests for the determination safe bearing capacity and depth below the existing ground level to lay the foundations safely and economically has been undertaken by Rajmi Geoexploration & Engg. Pvt. Ltd.

2.0 AIMS & SCOPE OF INVESTIGATION

The present soil investigation work has been assigned to M/S Rajmi Geoexploration & Engg. Pvt. Ltd., Indore, by M/S Ecopro Environmental Services, Indore (M.P.).

The proposed work includes the geological core logging and Engineering Classification of the rock and to conduct the laboratory tests to ascertain the depth of foundation and the Safe Bearing Capacity at one location of the Anicut. The drillinconsultant. The geological core logging and the engineering classification of the rock has been done by the officials of M/s Rajmi Geoexploration & Engg. Pvt. Ltd, Indore. *This core logging, classification and subsequent recommendations are based upon the core samples extracted, presented and submitted for laboratory testing by the officials of M/s Ecopro Environmental Services, Indore (M.P.).*

The following was the Geotechnical Investigation Program:

On the Soil sample the following tests have been performed

1. Grain Size Ananalysis
2. Atterbeg's Limit
3. Specific Gravity
4. Triaxial Compression Test (UU)
5. Natural Moisture Content

2.1 FIELD & LABORATORY TESTS

2.1.1 Field Tests/work:-

The following field works have been planned

(i) **Standard Penetration Test (SPT)** - It is the most popular and economical means to obtain subsurface information. It is estimated that 85 to 90 percent of the conventional foundation design in North and South America is made using SPT. The conduction of SPT test has been done is accordance with IS 2131 (1981) – "Method of standard penetration test for Soils". A split spoon sampler 50.8 mm outer diameter and 35 mm internal diameter is driven into the undisturbed soil at the bottom of borehole under a hammer of 65 kg weight falling through a height of 75 cm. The number of blows required to drive the sampler 30 cm beyond sitting drive of 15 cm is termed as Standard Penetration Resistance denoted by N.

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3.0 DISCUSSIONS

Geotechnical investigation work has been carried out at the site of Nagar Palika, Badnawar. One borehole for machine drilling was decided by client and drilled by the drilling agency.

4.0 COMPUTATIONS OF SAFE BEARING CAPACITY

For Soil

(I) BASED ON SHEAR CONSIDERATION

Various kinds of Shear tests are there to get shear parameters for all samples. The Safe Bearing Capacity is calculated as per IS: 6403- 1981 (determination of bearing capacity of shallow foundations). For local and general shear failure the net safe bearing capacity is given as follows:

$$Q_{ns} = [C N_c S_c d_c i_c + q (N_q - 1) S_q d_q i_q + \frac{1}{2} B \gamma N_\gamma d_\gamma i_\gamma W] / F \quad (\text{In case of General shear failure})$$

$$Q_{ns} = [2/3 C N'_c S_c d_c i_c + q (N'_q - 1) S'_q d'_q i'_q + \frac{1}{2} B \gamma N'_\gamma S_\gamma d_\gamma i_\gamma W] / F \quad (\text{In case of local shear failure})$$

Where q_{ns} = Net Safe Bearing Capacity

C = Cohesion (for Non cohesive material $C = 0$)

Φ = Angle of internal friction

Φ' = $\tan^{-1}(0.67 \tan(\Phi))$ for local shear failure

γ = Average density of over burden

N_c, N_q, N_γ = Bearing Capacity factors for General Shear Failure

N'_c, N'_q, N'_γ = Bearing Capacity factors for Local Shear Failure

S_c, S_q, S_γ = Shape factors

d_c, d_q, d_γ = depth factors

i_c, i_q, i_γ = inclination factors (1 in the case of vertical loads)

q = Effective surcharge at depth of "X" Mt below ground level.


W = Water Table correction factor is $\frac{1}{2}$ (When WT is at base of footing)


B = Width of footing in m

F = Factor of safety

BH - 1 (At 2.00 m depth below existing ground level)

$c = 53 \text{ kPa}$, $\Phi = 10^\circ$, $\gamma = 16.3 \text{ kN/m}^3$ Assuming a footing of 6.0 m X 6.0 m, $D = 2.00 \text{ m}$


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नगर परिषद, बदनार
जिला धार (म.प्र.)

Considering local shear failure. To find the Φ' value corresponding to this value of $\Phi = 10.0^\circ$ we know that $\tan \Phi' = (2/3 \tan \Phi)$. Substitute the value of $\Phi = 10.0^\circ$ we get $\Phi' = 6.70^\circ$. Now the values of N_c , N_q and N_γ shall be respectively 7.12, 1.88 and 0.71. Substitute in the equation we get $q_{nu} = 381.504 \text{ kN/m}^2$. Using a factor of safety of 3, we get $q_{ns} = 127.16 \text{ kN/m}^2$.

$D = 3.0 \text{ m}$

Considering local shear failure. To find the Φ' value corresponding to this value of $\Phi = 10.0^\circ$ we know that $\tan \Phi' = (2/3 \tan \Phi)$. Substitute the value of $\Phi = 10.0^\circ$ we get $\Phi' = 6.70^\circ$. Now the values of N_c , N_q and N_γ shall be respectively 7.12, 1.88 and 0.71. Substitute in the equation we get $q_{nu} = 402.067 \text{ kN/m}^2$. Using a factor of safety of 3, we get $q_{ns} = 134.022 \text{ kN/m}^2$.

4.2.1 (For Rock)

According to the Indian Standard Code (IS: 12070 -1987 reaffirmed in 2005) the safe bearing capacity of the rock can be obtained by any of the following methods

By Rock Mass rating

By Core Strength

By Pressure meter

By conducting plate load test

It has been shown that the choice of the method depend upon the quality of the rock. For the good rock quality with wide (1m to 3m) or very wide ($>3\text{m}$) spacing of discontinuity RMR criteria should be adopted. Rock mass with closed discontinuity at moderately close (0.3 to 1m) spacing the criteria of core strength should be adopted.

In our case we have adopted RMR criteria.

4.2 Rock Mass Rating:-

For computation of bearing capacity of rock formation the geological observations for joints faults, shear zone etc are important. The Rock Mass Rating (RMR) Value is obtained based upon many factors as follows

Strength of Rock: - The RMR value depends upon the Unconfined Compressive Strength (UCS) of the rock. Depending upon the value of Strength of rock core the rating points from 0 to 15 are awarded. Table shows the RMR increment for UCS values as follows

उपयंत्र
नगर परिषद बदनावर
जिला धार(म.प्र.)

मुख्य नगर मालिका अधिकारी
नगर परिषद, बदनावर
जिला धार (म.प्र.)

Unconfined Compressive Strength (MPa)	RMR Increment	
> 200	15	* Do not use this rock
100 – 200	12	
50 – 100	7	
25 – 50	4	
10 – 25	2*	
3 – 10	18	
<3	0*	

Drill Core Quality: - The drill quality is related to the Rock Quality Designation (RQD). Depending upon RQD value the rock is given rating points ranging from 3 to 20 is awarded. Table shows the RMR increment for UCS values as follows;

RQD (%)	91 – 100	76 – 90	51 – 75	25 – 50	<25
Rating Increment	20	17	13	8	3

Joint Spacing: - The RMR value depends upon the spacing of joints. The rating increment should reflect the joint set which is the most critical for a particular application. If the rock mass has fewer sets of joints, the rating is increased. Depending upon the spacing of joints the rock is given rating points ranging from 5 to 30 is awarded. Table shows the RMR increment for UCS values as follows;

Joint Spacing (m)	>3	1- 3	0.3 – 1	0.005 – 0.3	< 0.005
Rating Increment	30	25	20	10	5

Joint Characteristics: - The condition of the joint sets most likely to influence a particular application should be considered for the rating. The increment of RMR for joint characteristics depends upon the roughness of the joint. Based upon the joint conditions such as very rough surface smooth surface etc. rock is given rating points from 0 to 25. Table shows the RMR increment for UCS values as follows;

उपयंत्र
उपयंत्र
नगर परिषद बदनावर
जिला धार(म.प्र.)


मुख्य नगर पालिका अधिकारी
मुख्य नगर पालिका अधिकारी
नगर परिषद, बदनावर
जिला धार (म.प्र.) 8


Joint Description	Rating increment
Very rough surface of limited extent; hard wall rock	25
Slightly rough surface aperture less than 1 mm; hard wall rock	20
Slightly rough surface; aperture less than 1 mm; soft wall rock	12
Smooth surface, or gauge filling 1.5 mm thick or aperture of 1.5 mm, joints extending more than several meters	6
Open joints filled with more than 5 mm of gauge, or more than 5 mm; joint extending more than several meters	0

Ground water conditions: - Ground water condition can influence the rock mass behavior to a large extent. The RMR value depends upon the general condition of the rock, which, in turn, depends upon the ground water. Depending upon the ground water condition the rock is given rating points ranging from 1 to 10 are given. Table shows the RMR increment for UCS values as follows;

General Condition	Inflow per 10 m tunnel length (lit/min)	Joint water pressure divide by major principal stress	Rating Increment
Completely dry	None	0	10
Moist	25	0 - 0.2	7
Water under Moderate pressure	25 - 125	0.2 - 0.5	4
Severe water problems	125	0.5	1

Based upon the RMR value (obtained by adding the rating points of the entire five criterion as above the rock classified as very poor (RMR 0- 20), poor (RMR 21-40), fair (RMR 41-60), good (RMR 61-80 and very good (RMR 81-100). As per IS 12070 the Safe Bearing Capacity can be obtained based upon rock classification.


उपेन्द्र
नगर परिषद बदनावर
जिला धार(म.प्र.)


मुख्य नगर पालिका अधिकारी
नगर परिषद, बदनावर
जिला धार (म.प्र.)

5A RECOMMENDATIONS

From the field observations and based upon the test results following are the conclusions.

- (1) Raft Footings may be provided at a Minimum depth of 2.0m to depth. The safe bearing capacity at this depth is recommended as 80 kN/m². While at depth of 3.0m safe bearing capacity is recommended as 100 kN/m².


 ॐ
 नगर अभियंता, बटनाकर
 जिला बाग (म.प्र.)

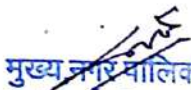

 मुख्य नगर अभियंता
 नगर अभियंता, बटनाकर
 जिला बाग (म.प्र.)



6.0 REFERENCE CODES & STANDARDS

Sr. No.	CODE NO	TITLE OF CODE
1.	IS 1892:1979	Code practice for subsurface investigations for foundations
2.	IS 2131:1981	Method of standard penetration test for soils
3.	IS2132:1986	Code practice for thin walled tube sampling of soils
4.	IS:2720 (part IV)-1995	Grain Size Analysis
5	IS2720 (part V)-1995	Consistency limits
6	IS 2720 (part III/Sec 2)-1997	Specific gravity
7	IS 2720 (part II)-1997	Natural moisture content
8	IS 2720 (Part XI) - 1997	Triaxial compression Test
9	IS 2720 IS 2720 (part-XIII)-1997	Direct Shear Test
10	IS6403:1997	Code of practice for determination of bearing capacity of shallow foundations
11	IS 8009 (part-I)-1993	Code of practice for calculation of settlement of foundations


 उपयंत्री
 नगर परिषद बदनावर
 जिला धार (म.प्र.)


 मुख्य नगर मालिका अधिकारी
 नगर परिषद, बदनावर
 जिला धार (म.प्र.)



ECO-PRO ENVIRONMENTAL SERVICES

363-A Mahatma Gandhi Marg, More Road, New Delhi, India - 110011
Tel: 011-40651172, Mobile: 9754929475, email: ecopro@ecoproindia.com

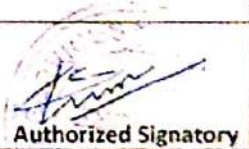
Certificate of Analysis


To
Chief Municipal Officer
Badnawar Municipal Council
Distt Badnawar , M.P.

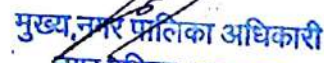
Nature of Sample: Waste Water	Work Order No.: NA
Collected From: Nallah No.2	Your Ref. No.: Waste Water
Collected BY: Company	Date of Receipt: 20/04/2023
Quantity: 1 Liter	Date of Certificate: 27/04/2023
Sealed (Y/N): N	Sample Code: 016

RESULTS OF ANALYSIS ENVIRONMENT PROTECTION ACT, 1986

S.No	Test Name	Results
1	Ph	6.4
2	Total dissolved solid, mg/Lit	2285.12
3	Total suspended solid, mg/Lit	165.13
4	Chemical oxygen demand, mg/Lit	395.0
5	Biochemical oxygen demand, mg/Lit	72.0
6	Dissolve Oxygen, mg/Lit	4.9
7	Chloride as Cl mg/Lit	385.0
8	Oil & Grease mg/Lit	8.2


Authorized Signatory


नगर परिषद बदनावर
जिला धार (म.प्र.)


मुख्य नगर पालिका अधिकारी
नगर परिषद, बदनावर
जिला धार (म.प्र.)

Note: This report cannot be used as an evidence in the court of law and cannot be used in part or fully in any media without prior permission. Perishable samples will be destroyed after testing. This test report is only for the sample tested. Subject to Indore Jurisdiction.

Note: This report should be used as an advisory to the extent of the information provided. It is not intended to be used as a legal document. The user should consult with a professional engineer or other expert for the proper interpretation of this report.

S.No	Test Name	Results
1	PH	5.2
2	Total dissolved solids, mg/Ltr	2315.25
3	Total suspended solid, mg/Ltr	125.51
4	Chemical oxygen demand, mg/Ltr	419.0
5	Biochemical oxygen demand, mg/Ltr	21.0
6	Dissolve Oxygen, mg/Ltr	5.7
7	Chloride as Cl mg/Ltr	350.0
8	Oil & Grease mg/Ltr	9.5




(Signature)
 (Signature)
 (Signature)

Nature of Sample: Waste Water
 Work Order No.: NA
 Collected From: Nallah No. 1
 Your Ref. No.: Waste Water
 Collected By/Company
 Date of Receipt: 20/04/2023
 Quantity: 1 liter
 Date of Certificate: 27/04/2023
 Sample Code: 015
 Sealed (Y/N): N
 RESULTS OF ANALYSIS
 ENVIRONMENT PROTECTION ACT, 1986

To
 Chief Municipal Officer
 Badnawar Municipal Council
 Dist Badnawar, M.P.

Certificate of Analysis



ECO-PRO ENVIRONMENTAL SERVICES

B-204, Sector-10, Gurgaon, Haryana
 Tel: 0129-4000171, 4000172, 4000173, 4000174, 4000175, 4000176, 4000177, 4000178, 4000179, 4000180
 Email: info@ecoproindia.com

144 Annexure 5

क्षेत्रीय कार्यालय, म.प्र.प्रदूषण नियंत्रण बोर्ड
विकास भवन, सेक्टर-2, पीथमपुर जिला धार (म.प्र.)

Email ID-repithampurmpch@gmail.com

क्रमांक 750 /क्षेकाधार/प्रनिबो/2023 पीथमपुर, दिनांक 18/09/23
प्रति,

**कलेक्टर,
कलेक्टर कार्यालय,
जिला धार/अलीराजपुर/झाबुआ (म.प्र.)**

विषय :- जिला अंतर्गत आने वाली समस्त नगर पालिका/नगर परिषद पर अधिरोपित पर्यावरण क्षतिपूर्ति राशि की भू-राजस्व में वसूली करने बाबत।

संदर्भ :- 1. बोर्ड मुख्यालय का पत्र क्रमांक 2043 दिनांक 11.08.2023.
2. इस कार्यालय का ई-मेल दिनांक 13.08.2023.

माननीय राष्ट्रीय हरित अधिकरण, प्रिंसिपल बेंच, दिल्ली में प्रचलित प्रकरण क्रमांक 606/2018 के अनुपालन में बोर्ड द्वारा संदर्भित पत्रों के माध्यम से अधिरोपित पर्यावरण क्षतिपूर्ति राशि जमा करने हेतु जिले की समस्त नगर पालिका/नगर परिषद के मुख्य नगर पालिका अधिकारियों को 15 दिवस के भीतर जमा करने हेतु निर्देशित किया गया था, परंतु आज दिनांक तक अधिरोपित पर्यावरण क्षतिपूर्ति की राशि जमा नहीं कराई गई है, जिसका विवरण निम्नानुसार है:-

क्रमांक	स्थानीय निकाय का नाम	पर्यावरण क्षतिपूर्ति की राशि (लाख रु.)
धार		
1	नगर पालिका परिषद धार	132
2	नगर पालिका परिषद पीथमपुर	186
3	नगर पालिका परिषद मनावर	102
4	नगर परिषद मांडव	42
5	नगर परिषद कुक्षी	102
6	नगर परिषद धरमपुरी	66
7	नगर परिषद धामनोद	66
8	नगर परिषद डही	42
9	नगर परिषद बदनावर	96
10	नगर परिषद राजगढ़	132
11	नगर परिषद सरदारपुर	42
झाबुआ		
1	नगर पालिका परिषद झाबुआ	132
2	नगर परिषद मेघनगर	102
3	नगर परिषद पेटलावद	102
4	नगर परिषद राणापुर	42
5	नगर परिषद थादला	102
अलीराजपुर		
1	नगर पालिका परिषद अलीराजपुर	102
2	नगर परिषद चन्द्र शेखर आजाद नगर	42
3	नगर परिषद जोबट	102

(2)

अतः आपसे अनुरोध है कि उपरोक्त विवरण अनुसार जिला अंतर्गत समस्त नगर पालिका/नगर परिषद के विरुद्ध अधिरोपित पर्यावरणीय क्षतिपूर्ति की वसूली भू-राजस्व के रूप में कर **Member Secretary, MPPCB Environment Protection Fund, NGT Account No. - 6310001200000043, IFSC Code - PUNB0631000** में जमा कराने का कष्ट करें। पर्यावरण क्षतिपूर्ति की राशि उपरोक्तानुसार जमा न करने की स्थिति में माननीय राष्ट्रीय हरित अधिकरण के आदेश अवहेलना होगी, इस कारण बोर्ड द्वारा मुख्य नगर पालिका/नगर परिषद अधिकारियों के विरुद्ध राष्ट्रीय हरित अधिकरण अधिनियम 2010 की धारा 26 सहपठित धारा 30 के तहत अपराधिक प्रकरण दर्ज किये जावेंगे।

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क्षेत्रीय अधिकारी

धार

पृ.क्रमांक ७५१ /क्षेकाधार/प्रनिबो/2023
प्रतिलिपि:-

पीथमपुर, दिनांक 18/09/23

1. आयुक्त नगरीय प्रशासन एवं विकास विभाग, शिवाजी नगर, भोपाल (म.प्र.) की ओर सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित।
2. सदस्य सचिव, म.प्र. प्रदूषण नियंत्रण बोर्ड ओर सूचनार्थ प्रेषित।
3. समस्त संबंधित मुख्य नगर पालिका अधिकारी, नगर पालिका/नगर परिषद की ओर बोर्ड मुख्यालय के पत्र क्रमांक 174 दिनांक 24.12.2021, पत्र क्रमांक 2043 दिनांक 11.08.2023 एवं इस कार्यालय के ई-मेल दिनांक 13.08.2023 के परिप्रेक्ष्य में सूचनार्थ एवं लेख है कि, उपरोक्तानुसार पर्यावरण क्षतिपूर्ति की राशि जमा करें।

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क्षेत्रीय अधिकारी

धार



क्षेत्रीय कार्यालय, धार
म. प्र. प्रदूषण नियंत्रण बोर्ड



स्कीम न. 78/सी, पार्ट 2, अरण्य, विजयनगर, इन्दौर-452010 (म.प्र.)
/क्षे.का.धार/2026, इन्दौर, दिनांक 12/3/26

क0 466
प्रति

कलेक्टर,
कलेक्टर कार्यालय,
जिला धार/अलीराजपुर/झाबुआ (म.प्र.)


विषय :- जिला अंतर्गत आने वाली समस्त नगर पालिका/परिषद पर अधिरोपित पर्यावरणीय क्षतिपूर्ति राशि की भू-राजस्व के रूप में वसूली करने बाबत।

संदर्भ :- कार्यालय का पत्र क्रमांक 750 दिनांक 18.09.2023.

उपरोक्त विषयांतर्गत संदर्भित पत्र के माध्यम से माननीय हरित अधिकरण, प्रिंसिपल बेंच, दिल्ली में प्रचलित प्रकरण क्रमांक 606/2018 के अनुपालन में बोर्ड द्वारा अधिरोपित पर्यावरण क्षतिपूर्ति राशि जमा करने हेतु जिले की समस्त नगर पालिका/नगर परिषद के मुख्य नगर पालिका अधिकारियों से 15 दिवस के भीतर जमा करवाने की कार्यवाही करने हेतु अनुरोध किया गया था, परन्तु आज दिनांक तक किसी भी नगरीय निकाय द्वारा अधिरोपित पर्यावरणीय क्षतिपूर्ति की राशि जमा नहीं कराई गई है। पत्र की प्रति सुलभ संदर्भ हेतु संलग्न है।

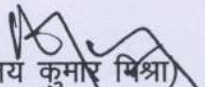
उक्त प्रकरण में आगामी सुनवाई दिनांक 23.03.2026 को नियत है। अतः आपके जिले अंतर्गत समस्त नगरीय निकायों के विरुद्ध अधिरोपित पर्यावरणीय क्षतिपूर्ति की राशि भू-राजस्व के रूप में वसूल कर बोर्ड के आधिकारिक बैंक खाते में जमा कराये जाने का अनुरोध है, जिससे माननीय अधिकरण के आदेशों का अनुपालन सुनिश्चित कर जानकारी प्रस्तुत की जा सके।

संलग्न:- उपरोक्तानुसार।


(अजय कुमार मिश्रा)
क्षेत्रीय अधिकारी

क0 467 /क्षे.का.धार/2026, इन्दौर, दिनांक 12/3/26
प्रतिलिपि -

1. आयुक्त, नगरीय प्रशासन एवं विकास विभाग, शिवाजी नगर, भोपाल की ओर सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित।
2. युनिट हेड (नगरीय ठोस अपशिष्ट), म.प्र. प्रदूषण नियंत्रण बोर्ड, भोपाल की ओर सूचनार्थ प्रेषित।
3. जिला धार/अलीराजपुर/झाबुआ के क्षेत्रांतर्गत स्थित संबंधित नगर पालिका/परिषद की ओर सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित।


(अजय कुमार मिश्रा)
क्षेत्रीय अधिकारी



क्षेत्रीय कार्यालय, धार
म. प्र. प्रदूषण नियंत्रण बोर्ड



स्कीम न. 78/सी, पार्ट 2, अरण्य, विजयनगर, इन्दौर-452010 (म.प्र.)

क0 664
प्रति

/क्षे.का.धार/2026,

इन्दौर, दिनांक 12/3/26

मुख्य नगर पालिका अधिकारी,
नगर परिषद, बदनावर,
जिला धार (म.प्र.)

विषय :- जल (प्रदूषण निवारण एवं नियंत्रण) अधिनियम 1974 एवं पर्यावरण (संरक्षण) अधिनियम 1986 में निहित प्रावधानों के उल्लंघन बाबत कारण बताओ नोटिस।

संदर्भ :- कार्यालय का प.पृ.कमांक 751 दिनांक 18.09.2023.

उपरोक्त विषयांतर्गत क्षेत्रीय कार्यालय, म.प्र. प्रदूषण नियंत्रण बोर्ड, धार द्वारा आपको निम्नलिखित सूचना दी जाती है :-

1. यह कि, म.प्र. प्रदूषण नियंत्रण बोर्ड का गठन जल (प्रदूषण निवारण तथा नियंत्रण) अधिनियम 1974 की धारा 4 के अंतर्गत किया गया है तथा बोर्ड को जल अधिनियम के साथ-साथ वायु (प्रदूषण निवारण एवं नियंत्रण) अधिनियम 1981, पर्यावरण (संरक्षण) अधिनियम 1986 एवं ठोस अपशिष्ट (प्रबंधन एवं हथालन) नियम 2016 को राज्य में लागू करने का दायित्व सौंपा गया है।
2. यह कि, अपशिष्ट (प्रबंधन एवं हथालन) नियम 2016 के नियम 15 के अनुसार नगरीय निकायों से जनित घरेलू ठोस अपशिष्ट के एकत्रण, स्रोत पर पृथक्करण, परिवहन, भण्डारण, उपचार एवं निष्पादन की शक्तियां एवं उत्तरदायित्व नगरीय निकायों को सौंपा गया है।
3. यह कि, नगरीय निकाय, बदनावर की जनसंख्या 2011 की जनगणना के आधार पर 20,917 थी, जिसके वर्तमान में लगभग 25,000 होने का अनुमान है।
4. यह कि, नगरीय निकाय द्वारा नगरीय क्षेत्र से उत्पन्न होने वाले घरेलू दूषित जल के संग्रहण हेतु सीवरेज सिस्टम एवं उपचार हेतु दूषित जल उपचार संयंत्र की स्थापना एवं संचालन का कार्य वर्तमान दिवस तक पूर्ण नहीं किया गया है।
5. यह कि, नगरीय क्षेत्र में घरेलू दूषित जल के उपचार की समुचित व्यवस्था स्थापित एवं संचालित न होने के कारण अनुपचारित दूषित जल नालियों के माध्यम से नदी में मिलने एवं नगरीय क्षेत्र से उत्पन्न नगरीय ठोस अपशिष्ट के निपटान की समुचित व्यवस्था न होने के कारण शिकायतें समय-समय पर प्राप्त होती रही है।
6. यह कि, पर्यावरणीय अधिनियमों के उल्लंघन के कारण माननीय राष्ट्रीय हरित अधिकरण द्वारा प्रकरण कमांक 606/2018 में समय-समय पर पारित आदेशों के परिपालन में नगरीय निकाय के विरुद्ध रु. 96 लाख की पर्यावरणीय क्षतिपूर्ति अधिरोपित की गई है, जो कि निकाय द्वारा आज दिनांक तक जमा नहीं की गई है।

E: \MPPCB Dhar\Letters -Hindi

0/c



क्षेत्रीय कार्यालय, धार
म. प्र. प्रदूषण नियंत्रण बोर्ड



स्कीम न. 78/सी, पार्ट 2, अरण्य, विजयनगर, इन्दौर-452010 (म.प्र.)

उक्त से स्पष्ट है कि, निकाय द्वारा जल (प्रदूषण निवारण एवं नियंत्रण) अधिनियम 1974 एवं पर्यावरण (संरक्षण) अधिनियम 1986 के प्रावधानों का उल्लंघन किया जा रहा है।

अतः आपको सूचित किया जाता है कि, उपरोक्त के संबंध में 07 दिवस में अपना पक्ष इस कार्यालय में प्रस्तुत करें, अन्यथा नगरीय निकाय के विरुद्ध जल (प्रदूषण निवारण एवं नियंत्रण) अधिनियम 1974 एवं पर्यावरण (संरक्षण) अधिनियम 1986 के प्रावधानों के अंतर्गत कार्यवाही प्रस्तावित की जावेगी, जिसकी समस्त जवाबदारी निकाय की होगी।

संलग्न:- उपरोक्तानुसार।

o/c

(अजय कुमार मिश्रा)
क्षेत्रीय अधिकारी

क0 465
प्रतिलिपि -

/क्षे.का.धार/2026,

इन्दौर, दिनांक 12/3/26

1. कलेक्टर, जिला धार की ओर सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित।
2. परियोजना अधिकारी, जिला शहरी विकास अभिकरण, जिला धार की ओर सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित।

(अजय कुमार मिश्रा)
क्षेत्रीय अधिकारी



क्षेत्रीय कार्यालय, धार
म. प्र. प्रदूषण नियंत्रण बोर्ड



स्कीम न. 78/सी, पार्ट 2, अरण्य, विजयनगर, इन्दौर-452010 (म.प्र.)

क0 518 /क्षे.का.धार/2026,
प्रति

इन्दौर, दिनांक 28/03/26

मुख्य नगर पालिका अधिकारी,
नगर परिषद, बदनावर,
जिला धार (म.प्र.)

विषय :- जल (प्रदूषण निवारण एवं नियंत्रण) अधिनियम 1974 एवं पर्यावरण (संरक्षण) अधिनियम 1986 में निहित प्रावधानों के उल्लंघन बाबत कारण बताओ नोटिस।

संदर्भ :- 1. कार्यालय का प.पू.कमांक 751 दिनांक 18.09.2023.

2. इस कार्यालय का पत्र कमांक 464, दिनांक 12.03.2026

उपरोक्त विषयांतर्गत क्षेत्रीय कार्यालय, म.प्र. प्रदूषण नियंत्रण बोर्ड, धार द्वारा आपको निम्नलिखित सूचना दी जाती है :-

1. यह कि, म.प्र. प्रदूषण नियंत्रण बोर्ड का गठन जल (प्रदूषण निवारण तथा नियंत्रण) अधिनियम 1974 की धारा 4 के अंतर्गत किया गया है तथा बोर्ड को जल अधिनियम के साथ-साथ वायु (प्रदूषण निवारण एवं नियंत्रण) अधिनियम 1981, पर्यावरण (संरक्षण) अधिनियम 1986 एवं ठोस अपशिष्ट (प्रबंधन एवं हथालन) नियम 2016 को राज्य में लागू करने का दायित्व सौंपा गया है।
2. यह कि, अपशिष्ट (प्रबंधन एवं हथालन) नियम 2016 के नियम 15 के अनुसार नगरीय निकायों से जनित घरेलू ठोस अपशिष्ट के एकत्रण, स्रोत पर पृथक्करण, परिवहन, भण्डारण, उपचार एवं निष्पादन की शक्तियां एवं उत्तरदायित्व नगरीय निकायों को सौंपा गया है।
3. यह कि, नगरीय निकाय, बदनावर की जनसंख्या 2011 की जनगणना के आधार पर 20,917 थी, जिसके वर्तमान में लगभग 25,000 होने का अनुमान है।
4. यह कि, नगरीय निकाय द्वारा नगरीय क्षेत्र से उत्पन्न होने वाले घरेलू दूषित जल के संग्रहण हेतु सीवरेज सिस्टम एवं उपचार हेतु दूषित जल उपचार संयंत्र की स्थापना एवं संचालन का कार्य वर्तमान दिवस तक पूर्ण नहीं किया गया है।
5. यह कि, नगरीय क्षेत्र में घरेलू दूषित जल के उपचार की समुचित व्यवस्था स्थापित एवं संचालित न होने के कारण अनुपचारित दूषित जल नालियों के माध्यम से नदी में मिलने एवं नगरीय क्षेत्र से उत्पन्न नगरीय ठोस अपशिष्ट के निपटान की समुचित व्यवस्था न होने के कारण शिकायतें समय-समय पर प्राप्त होती रही है।
6. यह कि, पर्यावरणीय अधिनियमों के उल्लंघन के कारण माननीय राष्ट्रीय हरित अधिकरण द्वारा प्रकरण कमांक 606/2018 में समय-समय पर पारित आदेशों के परिपालन में नगरीय निकाय के विरुद्ध रु. 96



क्षेत्रीय कार्यालय, धार
म. प्र. प्रदूषण नियंत्रण बोर्ड



स्कीम न. 78/सी, पार्ट 2, अरण्य, विजयनगर, इन्दौर-452010 (म.प्र.)

लाख की पर्यावरणीय क्षतिपूर्ति अधिरोपित की गई है, जो कि निकाय द्वारा आज दिनांक तक जमा नहीं की गई है।

7. यह कि, कार्यालय द्वारा संदर्भित पत्र क्रमांक 02 के माध्यम से आपको पत्र भेजा गया था, जिसका आपके द्वारा आज दिनांक तक उत्तर प्रस्तुत नहीं किया गया है।

उक्त से स्पष्ट है कि, निकाय द्वारा जल (प्रदूषण निवारण एवं नियंत्रण) अधिनियम 1974 एवं पर्यावरण (संरक्षण) अधिनियम 1986 के प्रावधानों का उल्लंघन किया जा रहा है।

अतः आपको सूचित किया जाता है कि, उपरोक्त के संबंध में 03 दिवस में अपना पक्ष इस कार्यालय में प्रस्तुत करें, अन्यथा नगरीय निकाय के विरुद्ध जल (प्रदूषण निवारण एवं नियंत्रण) अधिनियम 1974 एवं पर्यावरण (संरक्षण) अधिनियम 1986 के प्रावधानों के अंतर्गत कार्यवाही प्रस्तावित की जावेगी, जिसकी समस्त जवाबदारी निकाय की होगी।

संलग्न:- उपरोक्तानुसार।

(अजय कुमार मिश्रा)
क्षेत्रीय अधिकारी

क0 /क्षे.का.धार/2026, इन्दौर, दिनांक
प्रतिलिपि -

1. कलेक्टर, जिला धार की ओर सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित।
2. परियोजना अधिकारी, जिला शहरी विकास अभिकरण, जिला धार की ओर सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित।

(अजय कुमार मिश्रा)
क्षेत्रीय अधिकारी

151 Annexure 9

Photographs of Joint Inspection Dated – 11.03.2026 O.A. 28/2026 CZ) Earlier listed as OA No. 13/2026 (PB)

