BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL,
CENTRAL ZONAL BENCH, BHOPAL (MP)

IN THE MATTER OF
O.A. NO. : 130/2025 (CZ)

DWARKANATH CHOUDHARY & ANR …**PETITIONERS**

//VERSUS//

STATE OF MADHYA PRADESH & ORS. …**RESPONDENTS**

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DATE : 10.01.2026
PLACE : BHOPAL

ROHIT SHARMA
COUNSEL FOR THE RESPONDENT NO. 4

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL, CENTRAL ZONAL BENCH, BHOPAL (MP)

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ACTION TAKEN REPORT ON BEHALF OF THE RESPONDENT NO.4 – MUNICIPAL COUNCIL, BALAGHAT IN COMPLIANCE OF THE ORDER DATED 10.10.2025 PASSED BY THIS HON'BLE TRIBUNAL

It is most respectfully submitted on behalf of the Respondent No. 4 – Municipal Council, Balaghat as under: -

1. That, the present Original Application has been filed raising an issue regarding encroachment over the water body and discharge of untreated water into the said water body.
2. That, after perusal of the Joint Committee Report, the Hon'ble Tribunal, qua the previous order, directed the authorities concerned to remove the encroachment and not to discharge any untreated water into the water body.
3. That, pursuant to the aforesaid order, notices have been issued to three parties who have constructed their respective structures over the nallah going towards the water body. With respect to the other encroachments, it is humbly submitted that the land in question, wherein

Devi Talab is situated, is disputed in terms of its claimants and owners. The situation is not clear in this regard, as there has been a wrongly drawn battle contested before the Hon'ble High Court of Madhya Pradesh regarding the ownership of the land in question. However, even otherwise, in order to channelize the inflow of untreated water into this water body, a Detailed Project Report has been prepared and the Work Order has also been issued for channelization of the untreated water. Copies of the Detailed Project Report and the Work Order dated 02.01.2026 are marked and annexed herewith as **Annexure R/4/1** and **Annexure R/4/2**, respectively.

4. That, major work regarding cleaning around the water body has been done by the Answering Respondent, and the recent photographs demonstrating the current situation of the solid waste dumped around the water body are collectively marked and annexed herewith as **Annexure R/4/3** (Colly).

5. That, apparently, various litigations have taken place regarding the water body in question before this Hon'ble Tribunal as well, and accordingly, in order to seek clarification regarding the ownership of the land, a detailed letter has been written by the Answering Respondent to the S.D.M. on 08.01.2026, a copy

of which is marked and annexed herewith as **Annexure R/4/4**.

6. That, working towards betterment of the environment is a collective and joint effort not only by the District Administration but also by the local residents, and accordingly, the work so done has been demonstrated qua the instant Action Taken Report, and further progress shall be appraised to the Hon'ble Tribunal as and when required.

7. That, the present Action Taken Report is being supported by way of affidavit.

PRAYER

It is therefore humbly prayed that in view of the aforesaid submissions, this Hon'ble Tribunal may kindly be pleased to allow the instant application and take the Action Taken Report on record and pass appropriate orders in the interest of justice and fair adjudication of the matter.

DATE : 10.01.2026
PLACE : BHOPAL

ROHIT SHARMA
COUNSEL FOR THE RESPONDENT NO. 4

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL,

CENTRAL ZONAL BENCH, BHOPAL (MP)

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AFFIDAVIT

I, B.D. katrolia, S/o Shri Makundi Lal, Age about 61 Years, Chief Municipal Officer, Nagar Palika Parishad, Balaghat, (MP) - 481001, do hereby solemnly affirm an oath as under:

1. That I am the Chief Municipal Officer (Respondent No. 4) in the instant matter and fully conversant with the facts of the case and hence competent to swear on this Affidavit.
2. That I am filing an Action Taken Report before the Hon'ble National Green Tribunal, the contents of which are true and correct to the best of my knowledge and belief.
3. That the said Report has been drafted by my Counsel on my instructions.

मुख्य नगरपालिका अधिकारी
नगरपालिका परिषद बालाघाट
जिला बालाघाट (म.प्र.) 481001

VERIFICATION

I the above-named Deponent do hereby verify that the contents of this Affidavit from Para 1 to 3 are correct to the best of my knowledge and belief.

Signed and verified on this 9 Day of January, 2026 at Bhopal.

B.D. katrolia आत्मज Makundi Lal Nagar Palika Parishad Balaghat
आज दिनांक 9/1/26 को मेरे समक्ष
शपथ ग्रहण की। ... श्री ...
ने शपथ ग्रहिता को पहचाना

प्रमाणित किया जाता है कि शपथ ग्रहिता को मेरे समक्ष शपथ पत्र सुनाया समझाया गया। उसने सही समझकर हस्ताक्षर अंगूठा मेरे समक्ष अंकित किया।
शपथ आयुक्त भोपाल

IDENTIFIED BY ME

DEPONENT
मुख्य नगरपालिका अधिकारी
नगरपालिका परिषद बालाघाट
जिला बालाघाट (म.प्र.) 481001

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL, CENTRAL ZONAL BENCH, BHOPAL (MP)

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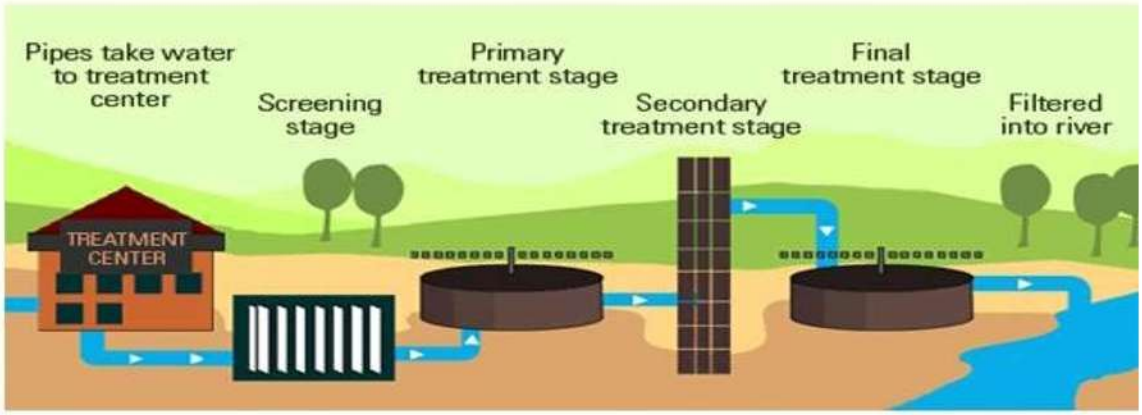
LIST OF DOCUMENTS

S. No.	Particulars	Annexure	Page No.
1.	Copy of the Detailed Project Report	R/4/1	7 - 135
2.	Copy of the Work Order dated 02.01.2026	R/4/2	130
3.	Copy of the recent photographs demonstrating the current situation of the solid waste dumped around the water body	R/4/3	131 -136
4.	Copy of the letter written by the Answering Respondent to the S.D.M. dated 08.01.2026	R/4/4	137

DATE : 10.01.2026
PLACE : BHOPAL

ROHIT SHARMA
COUNSEL FOR THE RESPONDENT NO. 4

URBAN ADMINISTRATION AND DEVELOPMENT DEPARTMENT (UADD), GOVT. OF M.P.



PREPARATION OF DRAFT PROJECT REPORT UNDER SBM-2.0, IN THE CITIES OF MADHYA PRADESH

BALAGHAT TOWN IN CLASS-

IIDRAFT PROJECT REPORT

PROJECT COST – 3637 LACS (INCLUDING GST)

CONSULTANT

ABR ARCHITECTURE & ASSOCIATES PVT. LTD.

BHOPAL (M.P.)

Table of Contents

Abbreviations

ASP : Activated Sludge Process

BOD : Biochemical oxygen demand

BOT : Built Operate Transfer

BPL : Below Poverty Line

BR : Biosphere Reserve

COD : Carbonaceous Oxygen Demand

CIP : Capital Investment Plan

DBO : Design Build Operate

EA : Extended Aeration

FOP : Financial Operating Plan

GIS : Geographical Information System

GSR : Ground Structure Reservoir

IHL : Individual household latrine

KL : Kiloliter

KM : Kilo Meter

LPCD : Liters per capita per day

LS : Lump Sum

M&E : Monitoring & Evaluation

M3 : Cubic Meter

MIS : Management Information System

MLD : Million Liters per Day

MSW : Municipal solid Waste

MSWM : Municipal solid Waste Management

NH : National Highway

NH3 : Ammonia

O&M : Operation & Maintenance

OG : Outer Growth

OHT : Overhead Tank

OSD : Open Sewerage Disposal

PPH : Persons per Hectare

PPP : Public Private Partnership

PRA : Participatory Rapid Assessment

SBR : Sequential batch Reactor

SH : State Highway

SPPF : Single-pit pour flush latrine

SS : Suspended solids

STP : Sewerage Treatment Plant

SWM : Solid Waste Management

SWOT : Strength, Weakness, Opportunity and Threat

TPPF : Twin-pit pour flush latrine

UASB : Upflow Anaerobic Sludge Blanket

ULB : Urban Local Body

VIP : Ventilated Improved Pit

WFPR : Work Force Participation Rate

WSP : Waste stabilization Pond

CHAPTER -1
INTRODUCTION AND SCOPE OF WORK

1.1 Project Background:

The Sustainable Development Goals (SDGs) place significant emphasis on sanitation, cleanliness and hygiene. There is evidence globally that better sanitation, hygiene and cleanliness helps in effective control of various vector borne diseases, parasite infections and nutritional deficiencies. There have been studies linking cleanliness and hygiene with reduction in respiratory disorders, gastrointestinal diseases (especially diarrhea), psychological issues and allergic conditions.

Swachh Bharat Mission (Urban) (SBM-U) had three major objectives: (a) achieving 100% Open Defecation Free (ODF) status, (b) ensuring 100% scientific Solid Waste Management (SWM), and (c) behavior change through 'Jan Andolan', by 2nd October 2019, in all statutory towns. The outlay of the Mission was `62,009 crores, including GoI share of 14,623 crores, and minimum State share of `4,874 crores. Balance funds (`42,535 crores) were to be generated through individual beneficiary contribution, PPP and other sources.

This Mission has achieved significant levels of success with massive engagement of citizens across all categories of society. Hence forth Mission is now being extended for a period of 5 (five) years, from 1st October 2021 to 1st October 2026, as Swachh Bharat Mission (Urban) 2.0 (SBM-U 2.0), for completing the work remaining, institutionalizing 'Swachh' behavior and making it sustainable. The Government of India in partnership with States/ UTs and ULBs is committed to make all cities 'Garbage Free' under SBM-Urban 2.0 in order to contribute to the

achievement of the Sustainable Development Goals (SDG) 2030, which will ultimately improve the quality of life and ease of living of urban populations, thus leading to urban transformation.

1.2 Objectives of SBM- U 2.0:

SBM-U 2.0 will be implemented with a vision of achieving "Garbage Free" status for all cities. This will involve the following:

• All households and premises segregate their waste into "wet waste" (from kitchen and gardens) and "dry waste" (including paper, glass, plastic, and domestic hazardous waste and sanitary waste wrapped separately);

• 100% door to door collection of segregated waste from each household/ premise.

• 100% scientific management of all fractions of waste, including safe disposal in scientific landfills.

• All legacy dumpsites remediated and converted into green zoneS.

• All used water including fecal sludge, especially in smaller cities are safely contained, transported, processed and disposed so that no untreated fecal sludge and used water pollutes the ground or water bodies.

1.3 Components of SBM-U 2.0:

1.3.1 Sustainable Solid Waste Management

• Ensuring cleanliness and hygiene in public places to make all cities clean and garbage free,

• Reducing air pollution arising out of SWM activities;

• Phased reduction in use of single-use plastic.

1.3.2 Sustainable Sanitation

• holistic Sanitation, with end-to end solutions (from discharge, containment, evacuation, transportation to safe disposal of all effluents from toilets).

• treatment of used water before discharge into water bodies, and maximum reuse of treated used water.

• eradication of hazardous entry into sewers and septic tanks, and sustaining elimination of manual scavenging through mechanization of sewer and septic tank cleaning operations.

1.3.3 Used water management

• desludging equipment, for scheduled and need-based desludging of all septic tanks;

• interception and diversion of drains (I&D) (including last mile connectivity for nearest sewer network).

• construction of Sewage Treatment Plants (STPs)/ STP cum Faecal Sludge Treatment plants (FSTPs) for used water treatment

1.3.4 Information, Education and Communication

National Level – A part of the overall IEC funds would be retained by MoHUA for the following:

• hiring of professional IEC/ BCC agency (on an outsourced basis) for developing IEC strategies, collaterals, content and tools and managing Social Media outreach.

• dissemination of national level campaigns regarding various components of SBM Urban.

• promotion of national level initiatives such as Swachh Survekshan, ODF+/ODF++/ Water+ and Garbage Free certifications etc;

• organisation of national level people centric events to raise advocacy for Garbage Free India.

State/ ULB level – the balance funds can be utilized at State/ULB for:

• dissemination of State/ ULB level campaigns regarding various components of SBM-U 2.0, including through interpersonal communication

• empanelment and engagement of NGOs/ CBOs/ CSOs for grassroots mobilization and sensitization regarding SBM-U 2.0;

• promotion of good practices at household/ individual level, collectives, RWAs, schools/ colleges, market associations etc;

• organization of promotional events (such as 'plog' runs, mass triggering activity, competitions etc.) related to SBM-U 2.0.

1.4 Scope of the project

Swachh Bharat urban 2.0 Scope is to make cities garbage free by 2026

1.5 Used water management project components:

• Sewage Treatment Plant

• Interception and diversion drains/ outfall sewer/ trunk main sewer

• Sewer & Septic tank cleaning machines

• Sewer Network

• Strengthening of Municipal drains

In this components Central funds will be released for STP, I&D , trunk main sewers, outfalls, septic tanks and cleaning equipments and components are fully funded by state government

1.6 Used water management Mission Implementation Strategy:

• City Sanitation Action Plan (CSAP) – part 2

o The CSAP Part 2 is expected to contain information on sewage management, specifically details of existing sewer networks, STPs, STP cum FSTPs, FSTPs and details of main municipal drains, etc,

along with gap analysis in respective infrastructure and proposed projects along with block cost estimate, as per standard template provided at Annex 3B

• Broad DPR preparation approach

o Sound foundation for sanitation in ULBs using sewer network based robust used water management approach followed by Sewage treatment facility.

o Where, States/ULBs, instead decides to adopt, municipal pucca drains based used water conveyance system, as interim arrangement, followed by I&D and Used Water and Septage treatment facility.

• DPR Preparation approach adopting sewer network & STP

o Sewer Network in Core Sanitation Zone

o Intercepting used water from open drains to Sewer network

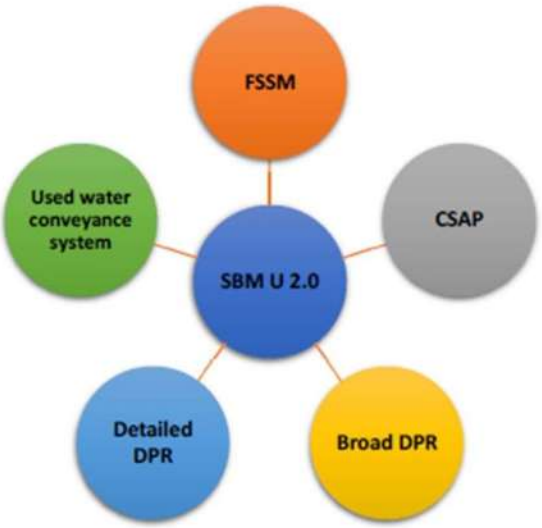
o Approach for Fringe Areas

o Provision for adequate Used Water Treatment Facility in each ULB

o STP Technology

• Municipal pucca drains based used water conveyance system, followed by I&D and Used Water Treatment Facility

Faecal sludge treatment approach



CHAPTER-2
ACTIVITY SCHEDULE

2.1 Activity 1 : Inception and Mobilization

The activity on Inception and Mobilization comprises the Team's assignment preparatory tasks and focusing on mobilizing team members and finalizing the Work Plan for assignment implementation.

a. Collection of Data and Conduct Reconnaissance Survey:

During the first few weeks period, field staff interacted with the officials, and made reconnaissance visits to the project site. During the visits, and held discussions with the concerned officials to understand and analyses the exiting situation of the municipality. The field staff held detailed discussions with concerned officials and the council in order to assess present status of ULB, understand deficiencies, needs and institutional arrangements etc. They have tried to collect documents available with ULB including base maps, and available secondary data on the city's demographics, master plan, Existing reports and other relevant documents etc

b. Finalize Methodology and Work Plan:

The methodology and work plan for preparation of the DPR was Updated and finalized based on the discussions with the officials and reconnaissance visits of ULB. The work plan detailing out all activities with timelines for each task with defined outputs and deliverables is enclosed as annexure I.

Outputs: The task on Inception and Mobilization will result in an ***CSAP-3B*** indicating approach, methodology, detailed work plan for implementation of the said Assignment along with the general discussion about macro level.

Staff Involved: All Field staff & Team Members

2.2 Activity 2: CSAP-3B

During this activity the team along with field staff will collect relevant data, carry out necessary Field Investigations, analyze & assess the data Collected, Undertake techno economic Feasibility analysis of various alternatives and preliminary costing, O&M and environment and social impacts.

a. Data Collection, Field Surveys.

The team will try to collect secondary level data available with various department concerned including base maps, demographics, master plan, Existing reports and other relevant documents etc.

b. Field Investigations

All the surveys, field investigations, testing's etc will be conducted as per the GoI norms with latest revisions

Topographical Surveys:

Field Teams will Carry out detailed topographic survey of the Project area and to prepare longitudinal sections of the system, contour maps and detailing all the temporary and permanent structures met within that width. All the structures and encroachments will also be marked with enough details. Take existing levels and preparation of drain network leading to the STP. The surveys shall done along with the Municipal Engineer. Temporary Bench Marks (TBM) will be established on all salient locations.

Water Quality

Water analysis for the present study is very important to investigate the water quality. It will be ensured that the Sample collection points are so that the overall water quality status is studied. Based on the reconnaissance survey the initial points for collection of sample will be identified. Efforts will be made to ensure that varied site locations are identified during the field visits. Necessary Geo Technical Investigations will be carried out for the proposed structures.

Review, analysis & Design

Analysis of Existing system records including the size, invert levels and ground levels of the Existing System; Reviewing the existing/ ongoing / proposed underground drainage arrangements in and around the project area, study of the underground drainage arrangement (both existing and proposed), identifying critical bottlenecks and problems of the existing system.

Meeting the following functional requirements:

o Sustainability

o Functionality (ease of maintenance, reliability of suggested measures)

o Cost effectiveness (maintenance, environmental benefits, balance between allowed damages vs. safety)

Based on the analysis, identification of the alternatives that may include liquid waste management system if any and Proposal of liquid waste management System in the areas where it is not existing, augmentation/extension, strengthening of existing structures etc will be done. The sewerage treatment and Disposal alternatives will be assessed and proposed.

Output: The output of this Activity will be ***CSAP-3B*** covering techno economic feasibility of various alternatives and preliminary cost etc.

Staff Involved: All Field staff & Team Members

2.3 Activity 3: Preparation of Draft Detailed Project Report

From the feasibility Report outcome the Team will compile the draft Detailed Project Report for the selected alternative including the preliminary design, drawings , estimates, survey plans, topographic maps, base maps.

Output: The output of this Activity will be ***Draft Detailed Project Report*** covering preliminary design, drawing, maps, cost estimate and implementation plans for each package, BOQ, financial analysis

Staff Involved: All Team Members

2.4 Activity 4: Preparation of Final Detailed Project Report

Based on the suggestions and Recommendations & Changes as Suggested by the Client the Team will finalize the Detailed Project Report including Final detailed design along with flow chart, site plan of STP, pumping station, lift stations etc. , L sections a plan of I&D network and major nala sewerage network , drawings, details of geo technical investigation, TBM details, cost estimates and BOQ. The Final DPR, Designs, etc., shall be in conformity to the IS / IRC / CPHEEO / MOUD requirements

Output: The output of this Activity will be Final Detailed Project Report covering Final detailed design , cost estimates and drawings

Staff Involved: All Team Members.

CHAPTER –3
SECONDARY DATA & FIELD INVESTIGATIONS

3.1 Collection of Data and Conduct Reconnaissance Survey:

The team has tried to collect secondary level data available with various departments concerned including base maps, demographics, master plan, Existing reports and other relevant documents etc. The details of the departments/Agencies and the data sort from the concerned is detailed below.

3.2 Reconnaissance & Field Investigations

Reconnaissance and Field Investigations are carried out to collect the information regarding the Balaghat Nagar palika, alignment of drains, geometry of the drains, details of cross drainage structures like culverts, bridges etc., encroachment details, tank details. The team visited the site and had a glance on general alignment, geography of the area, topography of the project area, details of frequent flooding areas, details of outfalls etc.

3.3 Field Investigations

All the surveys, field investigations, testings etc. are being conducted as per the GoI norms with latest revisions. The Activities of field investigation are elaborated below:

Topographic Survey

Topographic survey was carried out at 30 m interval as per IS codes, and to prepare longitudinal sections of the system, contour maps and detailing all the temporary and permanent structures met within that width. All the structures and encroachments were also marked with enough details. Take existing levels and preparation of drain network leading to the STP. Further Temporary Bench Marks (TBM) were established on all salient locations, one TBM at every strategic location.

Water Quality Sample Collection:

Collection of water Samples & Analysis of the Samples for Water quality – Physical and Chemical components such as BOD, COD, pH, Temperature, Suspended Sediment, Nutrients., and biological components like Coliforms, e-coli etc., as per the guidelines in the project area

Geo-Technical Investigations:

The geotechnical investigation was carried out as per IS codes to explore and determine the existing sub-strata conditions such as stratification, denseness or hardness of the strata, etc. and to evaluate approximate range of safe bearing capacity for the proposed structure using empirical formulas provided in the relevant IS codes. The goal of our investigation was to identify the key geotechnical issues that could potentially impact the proposed project and to develop geotechnical recommendations for design and construction of the project.

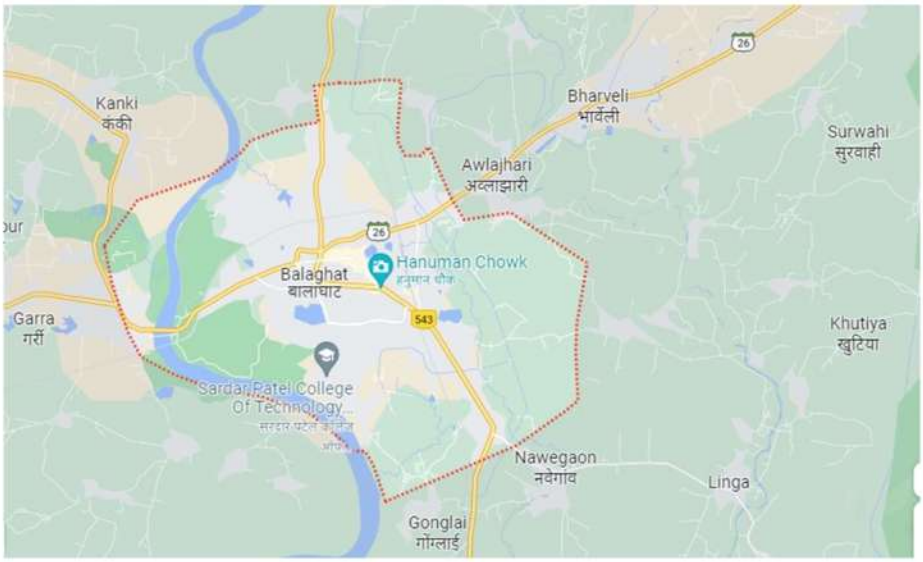
CHAPTER -4
INTRODUCTION & PRELIMINARY ANALYSIS OF THE TOWN

4.1 Salient Features:

1. Name of Town - Balaghat
2. District - Balaghat
3. Location - M.P.

Latitude 21°48'38.4"N

Longitude 80°11'42.5"E



Balaghat District is located in the southern part of Jabalpur Division. It occupies the south eastern portion of the Satpura Range and the upper valley of the Wainganga River. The district extends from 21°19' to 22°24' north latitude and 79°31' to 81°3' east longitude and the average elevation of 288 m. The total area of the district is 25 km^2. Balaghat District is bounded by Mandla District of Madhya Pradesh to the north, Dindori District to the northwest, Rajnandgaon. District of Chhattisgarh state to the east, Gondia and Bhandara districts of Maharashtra state to the south, and Seoni District of Madhya Pradesh to the west. The Main language spoken in district is Hindi, Gondi, Chattishgarhi and Pawari in Baihar & Ukwa, Pawari in Paraswada, Northern parts of Balaghat Tehsil and Bharveli, Kalari in Lanji & kirnapur, Pawari in western parts i.e. Waraseoni, Katangi & Lalbarra and Marathi in the southern part of the district.

Balaghat District was constituted during the years 1867 - 1873 by amalgamation of parts of the Bhandara, Mandla and Seoni districts. The headquarters of the district was originally called "Burha" or "बूढ़ा". Later, however, this name fell into disuse and was replaced by "Balaghat",

which was originally the name of the district only. Administratively, the district was divided into only two tehsils, Baihar tehsil in the north, which included the plateau region, and Balaghat tehsil in south, which included the more settled lowlands in the south. The new district was part of the Central Provinces Nagpur Division

- After Indian Independence in 1947, the Central Provinces became the Indian state of Madhya Pradesh. In 1956, Balaghat District became part of the Jabalpur Division of Madhya Pradesh
- Balaghat name signifies "above the ghats" and is due to the fact that the original purpose of Government in constituting the District was to effect the colonization of the tracts above the ghats

Divisions:

Administratively, the district is divided into eleven development blocks/Tehsils viz : Balaghat, Baihar, Birsa, Paraswada, Katangi, Waraseoni, Lalbarra, Khairlanji, Lanji, Kirnapur, and Tirodi.

4.2 Economy: About 33% of the manganese production in India comes from Balaghat District. The recently discovered copper deposit at Malanjkhand is regarded as the largest in the country. Bauxite, Kyanite, Marble, Dolomite, Clay and limestone are the other main minerals of the district.

In 2006 the Ministry of Panchayati Raj named Balaghat one of the country's 250 most backward districts (out of a total of 640). It is one of the 24 districts in Madhya Pradesh currently receiving funds from the Backward Regions Grant Fund Programme (BRGF).

4.3 Topography:

Balaghat captures the entire south eastern region of the Satpura Range, as well as the upper valley of the Wainganga River. It covers a vast land with covered with valleys and forests.Wainganga, Bawanthadi, Garhvi, and others are main rivers in the region. The Wainganga as well as its tributaries are the main rivers in this place, where the town of Balaghat is on the Wainganga, which flows north and south through the district. While, the Bagh as well as the Nahra and Uskal rivers are found to be the tributaries of the Wainganga. The southern lowlands in the region seems to be slightly flapping plain, are comparatively well-cultivated and deliberated by the Wainganga, the Son and Bagh, as well as the Deo and Ghisri rivers. There is a long narrow valley which is popular as the Mau Taluka, lying between the hills and the Wainganga river, that comprises a long, narrow, irregular-shaped lowland tract, crossed by the mountain ranges and peaks which were covered by the thick jungle, and runs generally from north to south. The lofty plateau, which is launched at the Raigarh Bichhia tract,

consists of many irregular hills, and were broken into several valleys, that flows from east to west. While the highest points in the district hills are the peaks that were above the Lanji. It is approximately about 2,300 to 2,500 feet (i.e, 760 m); while, Tepagarh hill is somewhat about 2,600 ft (i.e, 790 m), then Bhainsaghat range is somehow about 3,000 ft (910 m) above the sea. The Banjar, Halon and Jamunia rivers, as well as the tributaries of the Narmada, dried a part of the upper plateau.

Map of Balaghat

4.4 Climate:

Balaghat experiences tropical climate. There is very low rainfall during winter when compared to summer. During the month of April, the daytime temperatures are usually about 40°C or 104°F respectively. While in the night, the average minimum temperature gets reduced to 23°C, that's 74°F. However in recent years, the highest recorded temperature during the same month of April is said to be 45°C or 112°F, with the minimum recorded temperature of about 16°C or 61°F. Precipitation is very low in November (i.e, average 3 mm), and falls in the month of July with an average of 516 mm. With an average temperature of 35.0 °C, May is found to be the hottest month in the year. During the month of January, the average temperature is approximately 19.8 °C, which is the lowest average

temperature in the entire year. And between the driest and wettest months, the difference in the precipitation is 513 mm, and the average temperatures differ in the year by 15.2 °C.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Nov	Oct	Dec	Year
Record high °C (°F)	36.0 (96.8)	39.0 (102.2)	46.0 (114.8)	51.0 (123.8)	51.0 (123.8)	50.0 (122.0)	42.0 (107.6)	37.0 (98.6)	37.0 (98.6)	38.0 (100.4)	35.0 (95.0)	33.0 (91.4)	51.0 (123.8)
Average high °C (°F)	28.6 (83.48)	32.53 (90.55)	37.07 (98.73)	41.6 (106.88)	43.62 (110.52)	38.21 (100.78)	31.38 (88.48)	30.22 (86.4)	31.49 (88.68)	32.21 (89.98)	30.95 (87.71)	28.86 (83.95)	33.9 (93.02)
Daily mean °C (°F)	22.92 (73.26)	27.25 (81.05)	32.33 (90.19)	37.13 (98.83)	39.52 (103.14)	34.69 (94.44)	28.81 (83.86)	27.55 (81.59)	28.22 (82.8)	27.72 (81.9)	25.72 (78.3)	23.05 (73.49)	29.58 (85.24)
Average low °C (°F)	14.01 (57.22)	17.76 (63.97)	21.94 (71.49)	26.57 (79.83)	29.9 (85.82)	28.07 (82.53)	24.65 (76.37)	23.43 (74.17)	22.92 (73.26)	20.44 (68.79)	17.45 (63.41)	14.38 (57.88)	21.79 (71.22)
Record low °C (°F)	9.0 (48.2)	10.0 (50.0)	15.0 (59.0)	20.0 (68.0)	24.0 (75.2)	20.0 (68.0)	20.0 (68.0)	19.0 (66.2)	20.0 (68.0)	15.0 (59.0)	11.0 (51.8)	7.0 (44.6)	7.0 (44.6)
Average precipitation mm (inches)	22.57 (0.89)	19.84 (0.78)	19.0 (0.75)	6.16 (0.24)	6.67 (0.26)	195.35 (7.69)	546.53 (21.52)	471.08 (18.55)	267.79 (10.54)	84.58 (3.33)	6.42 (0.25)	8.2 (0.32)	137.85 (5.43)
Average precipitation days (≥ 1.0 mm)	2.55	2.91	3.18	2.27	2.45	16.36	27.64	28.45	19.36	8.73	1.36	1.27	9.71
Average relative humidity (%)	44.79	36.88	27.15	21.06	21.49	50.95	79.34	85.69	79.54	63.59	51.09	46.52	50.67
Mean monthly sunshine hours	8.58	11.24	11.43	12.65	13.1	12.86	11.4	11.24	11.67	8.41	8.65	8.62	10.82

4.5 Existing Water Supply Arrangements of Balaghat Municipal Council:

4.5.1 Existing Water Source

The present source of raw water source is surface water from river Wainganga. So, water drawn from this river to the town for complete supply.

Existing Water Supply Components of Balaghat WSS			
Sr. No.	**Components**	**Details**	Data regarding existing water supply component has provided by ULB Balaghat and they confirmed that all existing components are in Good Condition and accordingly the same have been considered in this scheme. (Except 11 MLD WTP, Raw water clear water pump to be replaced due to proposed head and
1	Water Source	Wainganga River	
2	Intake well:	2 Nos. Each 8 M dia and 25 M Height	
3	Raw water pump	2 Nos. (1W+1S) 67.5Hp, discharge 114 LPS, Head 30M @ 9.25 MLD Intake well 2 Nos. (1W+1S) 75Hp, discharge 127 LPS, Head 30M @ 11 MLD Intake well	
4	WTP	2 Nos. 9.25 MLD & 11 MLD	
5	Clear water pump	2 Nos. (1W+1S) 120Hp, discharge 127 LPS, Head 50M @ 9.25 MLD WTP	

<table>
<tr><td>6</td><td>Raw water rising main</td><td colspan="2">Dia 400 mm dia. DI K9 pipeline of length 173 m from 11 MLD Intake welllength 173 m from 9.25 MLD Intake well
Dia 400 mm dia. DI K9 pipeline of length 173 m from 11 MLD Intake well</td><td>discharge)</td></tr>
<tr><td>7</td><td>Clear water rising main</td><td colspan="2">200 mm Dia having 255 m length, 250 mm Dia having 5156 m length, 350 mm Dia having 480 m length, 400 mm Dia having 3370 m length and 450 mm Dia having 2130 m length of DI-K9 Pipe, Total 11351 m length of DI K9 pipe</td><td></td></tr>
<tr><td>8</td><td>Overhead Tanks</td><td colspan="2">6 nos. OHT's of capacity 1800 KL (Ward-22), 1800 KL (Ward-14), 850 KL(Ward-24), 850 KL(Ward-31), 450 (Ward-6), and 1100 KL(Ward-3)</td><td></td></tr>
<tr><td>9</td><td>Distribution Network</td><td>
<table>
<tr><th>Outer Dia(mm)</th><th>Inner Dia(mm)</th><th>Length HDPE (m)</th></tr>
<tr><td>90</td><td>80.4</td><td>1,53,864</td></tr>
<tr><td>110</td><td>96.8</td><td>24,510</td></tr>
<tr><td>125</td><td>112</td><td>1,573</td></tr>
<tr><td>140</td><td>125</td><td>6,605</td></tr>
<tr><td>160</td><td>142.8</td><td>6,061</td></tr>
<tr><td>180</td><td>160.8</td><td>1913</td></tr>
<tr><td>200</td><td>178.6</td><td>3,127</td></tr>
<tr><td>225</td><td>201</td><td>867</td></tr>
<tr><td>240</td><td>223.4</td><td>2,920</td></tr>
<tr><td>280</td><td>250.4</td><td>784</td></tr>
<tr><td>250</td><td></td><td>816</td></tr>
<tr><td>300</td><td></td><td>2493</td></tr>
<tr><td>350</td><td></td><td>1,316</td></tr>
<tr><td>400</td><td></td><td>99</td></tr>
</table>
</td><td colspan="2"></td></tr>
</table>

			450		31		
			Total		206,980		
10	Existing Water supplied (LPCD)*	106.5 LPCD					

Source- City Water Balance Plan

Existing Water Treatment Plant

Existing Water Treatment Plant

4.5.2 Gaps in Existing Water Supply System

Component	Present Status	CPHEEO Norms	Gap
Water Supply Rate (LPCD)	106.50	135	-53.63
No. of House Service Connections	24884	25194	-310

Source: - City Water Balance Plan

CHAPTER-5
Population Projection

5.1 Project Area

The project area will constitute of the entire Municipal Council of Balaghat as well as future growth areas outside the present limit. Hence per capita water supply 135 LPCD has been taken for the town.

5.2 Population Forecast

POPULATION PROJECTIONS					
year	Population	Average Increase	Incremental Increase	Decadel Growth Rate	Percentage Increase
1971	33346				
1981	53183	19837		0.48	0.59
1991	67151	13968	-5869	0.24	0.26
2001	75997	8846	-5122	0.12	0.13
2011	84261	8233	-613	0.10	0.11
		50884	-11604	0.94	0.00
Value of 'N'	5	4	3	4	4
Average		12721	-3868	0.24	0.22
		(Mean)	(Inc. mean)	(Dec. rate)	(Geo. rate)
Reference		X	Y	r_d	r_g
Population P_1	84230				(Negative Excluded)
CALCULATION OF PROJECTED POPULATION BY DIFFERENT METHODS					
Source: Analysis by the consultant					

ADOPTED POPULATION	
year	Population
2022	98223
2025	102039
2040	121121
2055	140202

5.3 Conclusion

1. Arithmetical method projects population between Incremental and Decadal/ Geometrical Growth Rate Method.

2. Geometrical or decadal growth method give the higher side of the Population forecast in the coming thirty to fifty years.

3. Incremental increase method gives the higher side of the Population forecast in the coming thirty to fifty years.

4. Adopted Population Projections: Arithmetical method of Population Projection gives more realistic value.

Arithmetical population gives a realistic value which shows the increase growth of town. Growth of this town is limited as many populations belong to the rural area and migrate to other towns and cities in search of employment. Because of this we have used Arithmetical population by all method.

5.4 Used Water Generation

Sr. No.	Parameter	Rate	Unit	Year			
				2022	2026	2040	2055
1	Population		nos	98223	103312	121121	140202
2	Water Demand	0.000135	mld	13.26	13.95	16.35	18.93
3	Total waste water generation (in MLD)	0.7	mld	7.52	7.81	9.16	10.60

5.5 Ward wise Population Forecasting

STP NO.1 GONGLAI					
Used Water Generation of Zone- 1,2,7					
Ward No.	**Ward Name**	**Covered%**	**2026**	**2024**	**2055**
4	Ward No. 4	100	3734	4377	5067
5	Ward No. 5	100	3082	3614	4183
6	Ward No. 6	100	3831	4491	5198
7	Ward No. 7	100	1618	1897	2195
8	Ward No. 8	100	1635	1917	2219
9	Ward No. 9	100	1818	2131	2467
16	Ward No. 16	100	1785	2092	2422
17	Ward No. 17	100	1781	2088	2417
18	Ward No. 18	100	1682	1971	2282
19	Ward No. 19	100	1935	2269	2627
20	Ward No. 20	100	1570	1841	2131
26	Ward No. 26	10	2924	3428	3968
27	Ward No. 27	50	1043	1223	1416
28	Ward No. 28	50	1717	2013	2330
29	Ward No. 29	100	1901	2229	2580
30	Ward No. 30	100	3155	3698	4281
31	Ward No. 31	100	2863	3356	3885
32	Ward No. 32	100	6599	7736	8955
Total Population			**46699**	**54395**	**62678**
Wast water generation 80% of 135 LPCD (MLD)			**5.04**	**5.87**	**6.76**
STP Capacity 70% of Wast Water Ganeration @ 2026			**3.528**	**4.109**	**4.732**

5.6 Zone wise Waste water Generation

STP NO.2 AHP SITE					
Used Water Generation of Zone- 3					
Ward No.	**Ward Name**	**Covered**	**2026**	**2040**	**2055**
1	Ward Name 1	100%	7467	8754	10134
2	Ward Name 2	100%	5023	5889	6816
3	Ward Name 3	100%	3627	4252	4922
13	Ward Name 13	50%	3851	4515	5226
Total Population			19968	23410	27098
Wast water generation 80% of 135 LPCD (MLD)			**2.15**	**2.52**	**2.92**
70% FOR STP			**1.5**	**1.76**	**2.04**

STP NO. 3 BUDHI TALABH					
Used Water Generation of Zone- 4					
Ward No.	**Ward Name**	**Covered**	**2026**	**2040**	**2055**
10	Ward Name 10	100	3726	4369	5057
11	Ward Name 11	100	4084	4788	5543
12	Ward Name 12	50	1054	1236	1431
14	Ward Name 14	100	1909	2237	2590
15	Ward Name 15	100	1704	1997	2313
Total Population			**12477**	**14627**	**16934**
Wast water generation 80% of 135 LPCD (MLD)			**1.34**	**1.57**	**1.82**
70% FOR STP			**0.93**	**1.09**	**1.27**

STP NO. 4 MOTI TALABH					
Used Water Generation of Zone- 5,6					
Ward No.	**Ward Name**	**Covered**	**2026**	**2040**	**2055**
21	Ward Name 21	50	913	1071	1239
22	Ward Name 22	100	1571	1842	2132
23	Ward Name 23	100	3460	4057	4696
24	Ward Name 24	100	4205	4929	5706
25	Ward Name 25	100	2007	2353	2723
Total Population			**12156**	**14252**	**16496**
Wast water generation 80% of 135 LPCD (MLD)			**1.31**	**1.53**	**1.78**
70% FOR STP			**0.91**	**1.07**	**1.24**

5.7 Zone Summary

Zone Wise Population Forecasting & Used Water Generation								
SL.NO.	**Zo ne**	**Populati on 2026**	**Used Wate r Gene ratio n (80% of 135 LPC D)**	**STP Capacity as Per SB M-2.0, 70% of use d Water**	**STP**	**STP LOCATION**	**STP IN MLD**	**Re mar ks**
1	ZONE-1,2,7	46699	5.04	3.528	3.96	KRISH UPAZ MANDI	4.00	Combine zone (1,2,7)
2	ZONE-3	19968	2.15	1.5	2.04	AHP SITE	2.00	-
3	ZONE-4	12477	1.34	0.93	1.63	BUDHI TALAB	1.00	-
4	ZONE-5,6	12156	1.31	0.91	1.02	MOTI TALAB	1.00	Combine zone (5,6)
TOTAL			**9.84**	**6.86**			**8.00**	

CHAPTER -6
DESIGN ASPECTS

6.1 Sewerage System

The sewerage system or water carriage system can be separate system or combined system or partially separate system depending on domestic sewage and rain water are drained through two separate set of pipes or through single set of piping. However, the combined system is not quite suitable in tropical Indian conditions as i) heavy and concentrated rainfall occurs during the monsoon period and thus there is a large variation in the quantity of sewage during different months of the year, ii) Dry weather flow is generally a very small proportion of the total flow and hence sewers are likely to get silted up due to low velocity of flow in lean periods, iii) capital funds are limited, iv) treatment costs and pumping costs are significantly reduced in separate system due to reduction in quantity.

Hence for the Current Project area a separate drainage System has been Proposed for the Collection and Conveyance of Sewerage. Further, The pipes for collection have been proposed using the Zonal pattern in which entire City/Town is divided into suitable zones and a separate interceptor is provided for each Zone.

6.2 Design Criteria

The 'Design Criteria' have been finalized primarily on the basis of recommendations of the 'Manual on Sewerage and Sewage Treatment' (2013) by CPHEEO under the ministry of Urban Development, Government of India. The Design Criteria for the major system components of the 'Sewerage Project' are described below:

6.3 Per Capita Sewerage flow

The Per capita Sewerage has been calculated as per Clause 3.5 of the CPHEEO Manual. As in arid regions, mean sewage flows may be as little as 40% of water consumption and in well developed areas; flows may be as high as 90%. However, the conventional sewers shall be designed for a minimum sewage flow of 108 litres per capita per day or higher as the case may be, Hence in the Current Case as the Municipality is a fastly developing area waste generated is assumed to be 90 % of the water supplied

6.4 Estimation of Quantity of Sewage

The total quantity of Waste water has been Estimated for the Municipality Considering the Domestic Sewerage, Sewerage from Commercial, Institutions & certain flows due to infiltration of ground water through joints. The sanitary sewers are not expected to receive storm water and industrial effluent hence are not Considered

Domestic Sewerage

The quantity of domestic sewage design flow is calculated by projecting present population for design year by using population projection figures and applying adopted per capita sewerage flow rate for projected population.

Sewerage from Commercial Institutions

The industries and commercial buildings often use water other than the municipal supply and may discharge their liquid wastes into the sanitary sewers. Estimates of such flows have been made separately

Infiltration

Estimate of flow in sanitary sewers may include certain flows due to infiltration of Ground water through joints. Since sewers are designed for peak discharges, allowances for Ground water infiltration for the worst condition in the area should be made. The design infiltration value shall be limited to a maximum of 10% of the design value of sewage flow.

Ground water infiltration

	Minimum	**Maximum**
Litres/ha/day	5000	50000
Litres/km/day	500	5000
Litres/day/manhole	250	500

6.5 Design period of sewerage components

The project components will be designed to meet the following periods :

S.no.	Design Components	Design period (Year from base year)
1	Land acquisition	30
2	Conventional sewers (A)	30
3	Pumping mains	30
4	Pumping station civil work	30
5	Pumping machinery	15
6	Sewerage treatment plants	15
7	Effluent disposal	30
8	Effluent utilization	15

6.6 Design period

Sewerage Project may be designed normally to meet the requirement over a 30 years period. Hence the project horizons are decided as given below.

- Base year : 2025
- Intermediate year : 2040
- Ultimate Year : 2055

6.7 Peak Factors

The peak factors with respect to contributing population for domestic waste water are furnished below. The peak factors are applied to the projected population for the design year considering an average per capita waste water flow based on allocation. The flow in sewers varies from hour to hour and seasonally. However, for the purpose of hydraulic design estimated peak flows are adopted. The details of peak factor considered as indicated in Table below

Contributory Population	Peak factor
Upto 20,000	3.0

Above 20,001 Upto 50,000	2.50
Above 50,000 Upto 7,50,000	2.25
Above 7,50,000	2.0

CPHEEO- Manual on Sewerage and Sewage Treatment (2013)

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 / odour, Ease of access to components of the system for repairs and maintenance, Safety / Hazardous conditions at the plant.

Although, the degree of treatment is set by state and central level regulatory agencies and applicable norms are to be strictly adhered selecting an appropriate sewage treatment technology requires proper consideration. Advance technology will achieve very high treatment standard and provide for reusing the treated sewage for beneficial purposes. Sewage treatment technology evaluated are listed below:

1. ASP with Extended Aeration (EAS)
2. Sequential Batch Reactor Process (SBR)
3. Moving Bed Bioreactor (MBBR)
4. Up-flow Anaerobic Sludge Blanket Process with Extended Aeration (USAB -EAS)
5. Membrane Bio Reactor (MBR)
6. DEWATS

CHAPTER -7
SEWERAGE STATUS – STUDY AREA

7.1 Existing Sewerage System

At present there is no underground sewerage system for town. This results in a very unhygienic state of the town as far as sewage disposal is concerned. There is no organized sewerage system in the entire town for safe disposal of the sewerage generated in the town. The waste water and the effluent from the septic tanks flow through the open gutters, flows in low level areas and get stagnated in open areas thereby creating nuisance. The town does not have a comprehensive system for safe disposal of waste water which results in the environmental pollution, contamination of water and other critical issues related to health of the people of the town. For all kinds of waste water disposal, two types of disposal systems are used in the town. Soak pit / Pit based toilets for soil waste and open drainage for kitchen, bath & Storm water disposal. In some area's sewage generated directly flows through open drains and its finally drained into water bodies and in open land area. There is an immediate need to develop an effective sewage system for the ULB.


GPS Map Camera
Balaghat, Madhya Pradesh, India
Q6P2+X7P, Balaghat, Madhya Pradesh
481001, India
Lat 21.78685°
Long 80.200915°
17/03/23 03:24 PM GMT +05:30
Google


GPS Map Camera
Balaghat, Madhya Pradesh, India
Q6P2+X7P, Balaghat, Madhya Pradesh
481001, India
Lat 21.786883°
Long 80.200975°
17/03/23 03:25 PM GMT +05:30
Google


GPS Map Camera
Balaghat, Madhya Pradesh, India
Q5MX+2J6, Balaghat, Madhya Pradesh
481001, India
Lat 21.783128°
Long 80.19762°
17/03/23 03:34 PM GMT +05:30
Google


GPS Map Camera
Gonglai, Madhya Pradesh, India
Q5HW+MJG, Gonglai, Madhya Pradesh
481001, India
Lat 21.779818°
Long 80.195271°
17/03/23 03:54 PM GMT +05:30
Google

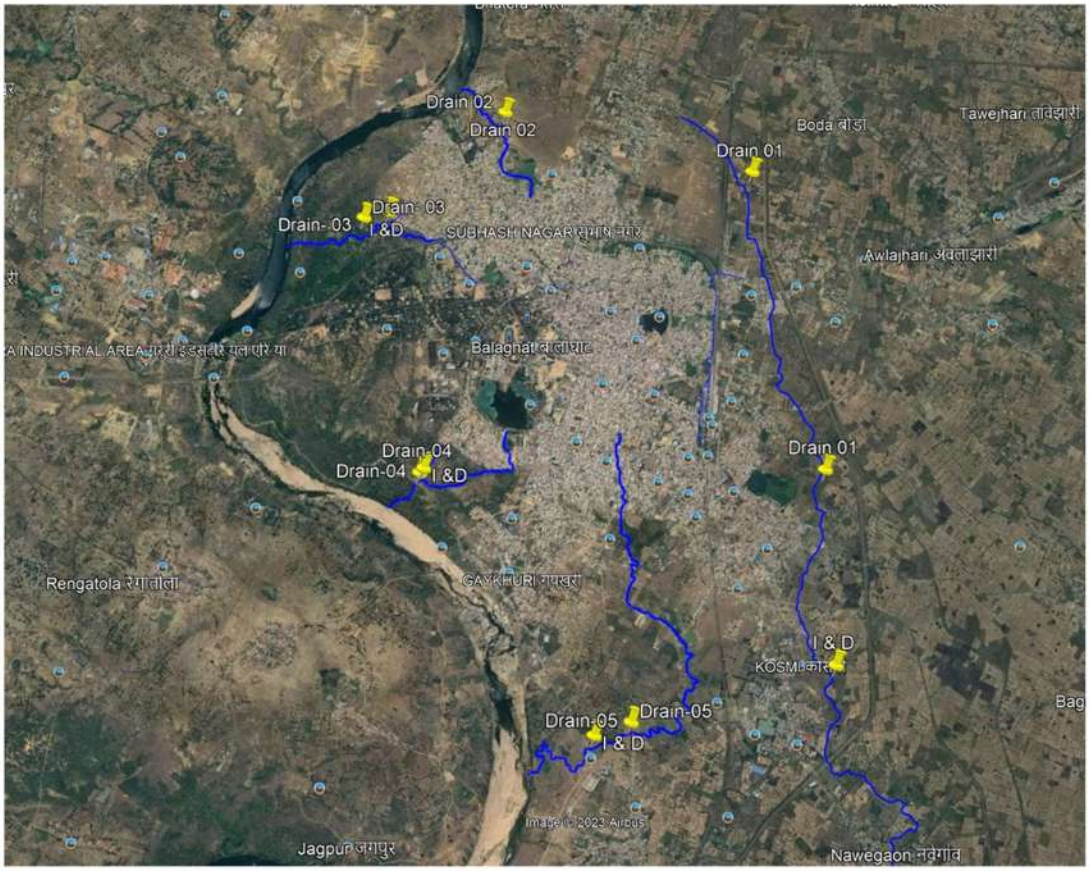
STP SITE PICTURE-


Network: 29-May-2024 2:10:12 pm IST
Local: 29-May-2024 2:10:10 pm IST


Network: 29-May-2024 1:08:49 pm IST
Local: 29-May-2024 1:08:48 pm IST


Network: 29-May-2024 3:09:27 pm IST
Local: 29-May-2024 3:09:26 pm IST
21°46'38.74"N 80°11'49.908"E
Geoglat
Jabalpur Division
Madhya Pradesh

7.2 Major Drains:



Balaghat don't have existing Underground Sewer network. There are total 5 nos. of drains Major Drains are present in the town of varying lengths.

Drain no. 01 kosmi nala

Drain no. 02 AHP site nala

Drain no. 03 Budhee nala

Drain no. 04 Power house nala

Drain no. 05 Moti nager nala

VENUS TESTING & RESEARCH LABORATORY

(Accredited as per ISO / IEC-17025:2017)
Khurai Road, Industrial Area, Bina, Distt. Sagar (M.P.) Pin - 470113
Mob. 9425644099, 9425425893
Email : vtrlbina@yahoo.co.in

TEST REPORT

Description of Sample: Sewage Water (1 Litre)
Sub: Testing of Sewage Water
Name of Work: Analysis of Sewage Water Sample.

Report No: VTRL/BINA/4912(A)/19/2022
Date of Receipt: 13/04/25
Date of Report: 18/04/25

Issued to,

The Chief Municipal Officer,
Nagar Palika Parishad- Balaghat,
Distt- Balaghat (M.P)

Location:Drain No- KOSMI

S. No.	Test Parameters	Result	Acceptable Limits	Test-Method
1.	PH Value	7.60	6.8-8.5	APHA, 4500-H+B,4-91 to 4-96
2.	Bio-Chemical Oxygen Demand as BOD,Mg/l	58	30	APHA, 5210 B, 5-5 to 5-16
3.	Total Suspended Soilids as TSS,mg/l	854	100	APHA, 2540 D, 2-66 to 2-67
4.	Chemical Oxygen Demand as Cod,Mg/l	202	250	APHA, 5520 B, 5-17 to 5-18
5.	Total Dissolved Solid ,TDS mg/l	763	2100	APHA, 2540 C, 2-65
6.	Chloride (as Cl),mg/l	94	1000	APHA, 4500 B, 4-73 to 4-73

----------End of the report----------

(Authorised Signatory)

T&C : 1. The result listed refer only to the tested samples and applicable parameters endorsement of product is neither inferred nor implied.
2. Total Liability of our Lab is limited to the invoiced amount 3.Samples will be destroyed after Ten Days from the date of issue of test report.
4. This report is not to be reproduce wholly or in part and cannot be used as evident in the court of law and should not be used in any advertising media without our special permission in writing.

VENUS TESTING & RESEARCH LABORATORY

(Accredited as per ISO / IEC-17025:2017)

Khurai Road, Industrial Area, Bina, Distt. Sagar (M.P.) Pin - 470113

Mob. 9425644099, 9425425898

Email : vtrlbina@yahoo.co.in

TEST REPORT

Description of Sample: Sewage Water (1 Litre)
Sub: Testing of Sewage Water
Name of Work: Analysis of Sewage Water Sample.

Report No: VTRL/BINA/4911(A)/35/2022
Date of Receipt: 12 /04/25
Date of Report: 17/ 04/25

Issued to,

The Chief Municipal Officer,
Nagar Palika Parishad- Balaghat,
Distt- Balaghat (M.P)

Location:Drain Ahp Site

S. No.	Test Parameters	Result	Acceptable Limits	Test-Method
1.	PH Value	7.62	6.8-8.5	APHA, 4500-H+B,4-91 to 4-96
2.	Bio-Chemical Oxygen Demand as BOD,Mg/l	57	30	APHA, 5210 B, 5-5 to 5-16
3.	Total Suspended Soilids as TSS,mg/l	826	100	APHA, 2540 D, 2-66 to 2-67
4.	Chemical Oxygen Demand as Cod,Mg/l	198	250	APHA, 5520 B, 5-17 to 5-18
5.	Total Dissolved Solid ,TDS mg/l	749	2100	APHA, 2540 C, 2-65
6.	Chloride (as Cl),mg/l	92	1000	APHA, 4500 B, 4-73 to 4-73

----------End of the report----------

VENUS TESTING & RESEARCH LABORATORY

(Accredited as per ISO / IEC-17025:2017)

Khurai Road, Industrial Area, Bina, Distt. Sagar (M.P.) Pin - 470113
Mob. 9425644099, 9425425898
Email : vtrlbina@yahoo.co.in

TEST REPORT

Description of Sample: Sewage Water (1 Litre)
Sub: Testing of Sewage Water
Name of Work: Analysis of Sewage Water Sample.

Report No: VTRL/BINA/4908(A)/18/2022
Date of Receipt: 08/04/25
Date of Report: 13/04/25

Issued to,

The Chief Municipal Officer,
Nagar Palika Parishad- Balaghat,
Distt- Balaghat (M.P)

Location:Drain No-04, Near Balaghat Hospital

S. No.	Test Parameters	Result	Acceptable Limits	Test-Method
1.	PH Value	7.58	6.8-8.5	APHA, 4500-H+B,4-91 to 4-96
2.	Bio-Chemical Oxygen Demand as BOD,Mg/l	55	30	APHA, 5210 B, 5-5 to 5-16
3.	Total Suspended Soilids as TSS,mg/l	810	100	APHA, 2540 D, 2-66 to 2-67
4.	Chemical Oxygen Demand as Cod,Mg/l	196	250	APHA, 5520 B, 5-17 to 5-18
5.	Total Dissolved Solid ,TDS mg/l	738	2100	APHA, 2540 C, 2-65
6.	Chloride (as Cl),mg/l	90	1000	APHA, 4500 B, 4-73 to 4-73

----------End of the report----------


SWACHH BHARAT

7.3 Means of sewerage disposal

Presently, the total sewerage generated is being disposed into river through open nallas in an unscientific manner. The sewerage of major portion of the houses, is disposed into open nalas (kaccha and pucca). This untreated sewerage drained into water bodies and other open land area creating an unhygienic condition and deteriorating the environment.

7.4 Sanitation facilities

The town is ODF+ as per Swachh Bharath. The data shows that 70% of the households have both toilets and septic tank facilities.

7.5 Present and Future Used Water generation:

Present estimated demand stands at 11.16 MLD (80% of water supply demand Per Capita Supply @ of 135 LPCD for base year 2026.

Sr. No.	Parameter	Rate	Unit	Year			
				2022	2026	2040	2055
1	Population		nos	98223	103312	121121	140202
2	Water Demand	0.000135	mld	13.26	13.95	16.35	18.93
3	Used water Rate (80 % water Supply Rate)	0.000108	mld	10.61	11.16	13.08	15.14

7.6 Disposal and treatment facility:

Currently there is No sewage treatment available at the Municipal level. Sewerage is being directly disposed into the open drain without any treatment.

CHAPTER –8
PROJECT PROPOSAL

8.1 Proposed Conveyance System

Liquid waste management system for Balaghat Nagar Palika consist of Sewerage demand 15.14 MLD (2055). Based on the analysis, identification of the alternatives that may include liquid waste management system if any and Proposal of liquid waste management System in the areas where it is not existing, augmentation/extension, strengthening of existing structures etc. will be done. The sewerage treatment and Disposal alternatives will be assessed and proposed.

Further, the city has been proposed using the Zonal pattern in which entire town is divided into five zones.

The zone map drawing has been attached separately.

8.2 Salient Features of Liquid waste management system

S.NO.	Description	Proposed
1	Type of system	Liquid waste management system
2	Design Period	• Base Year : 2026 • Intermediate Year : 2040 • Ultimate Year : 2055
3	Designed Wastewater flow	8.50 MLD (2026)
4	Total number of zones	7
5	Major Water bodies	Wainganga
6	Primary nallas	11
7	I&D	Separate interceptor is provided
8	Septage conveyance	Open channel
9	Sewer network	Open nallas carry waste water

8.3 Details of sewerage network- proposed

The liquid waste management system is designed for a total Demand of 15.14 MLD. The project area divided into 5 zones based on the ground topography. The entire town is divided into 5 zones i.e Zone-I, Zone-II, zone-III, zone-IV & Zone-V.

In Zone-II, zone-III, zone-IV & Zone-V areas, outfalls are in the river. The waste water will be collected from these channels before outfall and will divert to our collection well and STP.

8.4 Sewage Treatment Plant

The degree of treatment set by state and central level regulatory agencies and applicable norms are to be strictly adhered selecting an appropriate sewage treatment technology requires proper consideration.

8.5 STP Capacity Requirement

Parameter		
STP Capacity Required	MLD	11.16 MLD (2026) 15.14 MLD (2055)
STP Capacity Proposed as per SBM guidelines	MLD	8.0
Existing Capacity of STPs	MLD	0
Proposed STP capacity required to be developed now -	MLD	8.00
STP Technology for 4.0 MLD STP	MLD	SBR
STP Technology for 2.0 MLD STP	MLD	RMBR
STP Technology for 1.0 MLD STP	MLD	RMBR
STP Technology for 1.0 MLD STP	MLD	Construction wetland

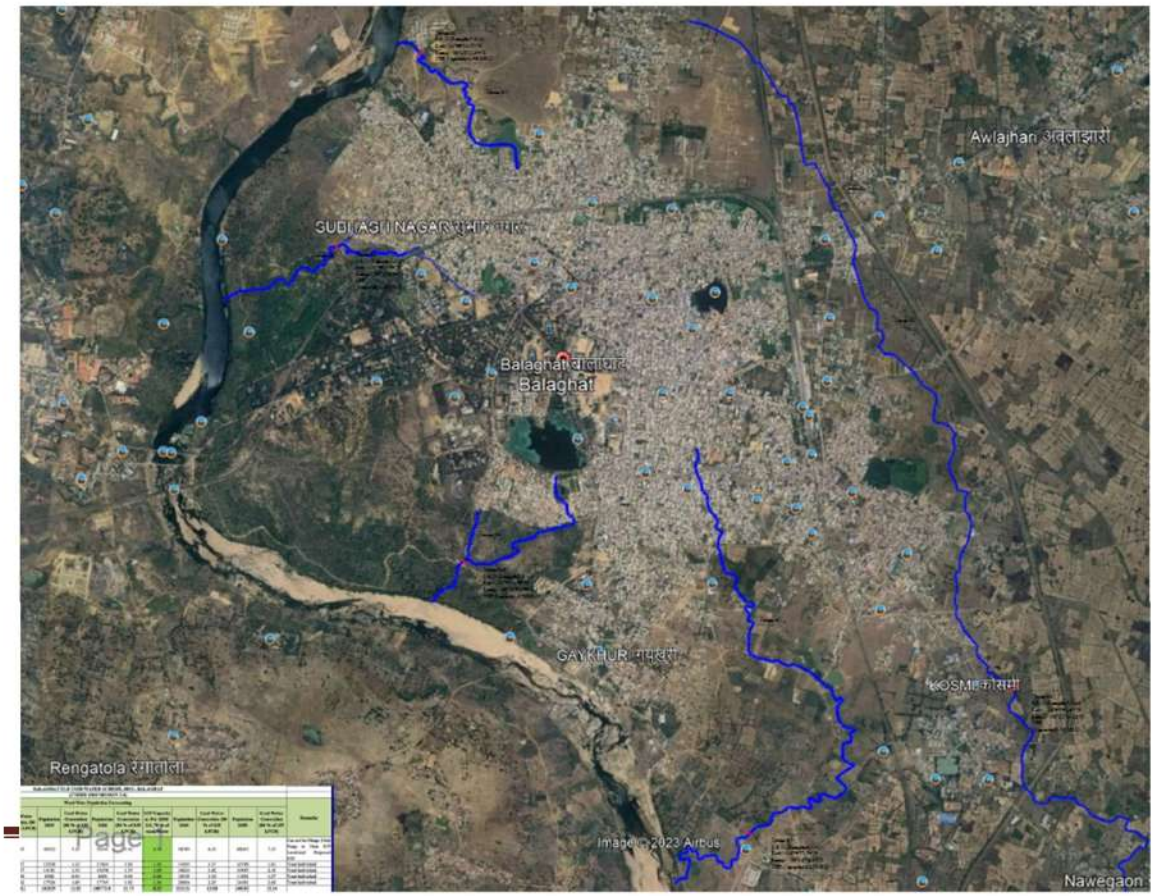
CHAPTER - 14

8.8 Proposed STP s I&D details:

each drain to collect water from open nalas to our proposed STP. estimate of which has been attached separately at end.

Balaghat don't have existing Underground Sewer network. There are total 5 nos. of drains Major Drains are present in the town of varying lengths.

Drain no. 01 kosmi nala
Drain no. 02 AHP site nala
Drain no. 03 Budhee nala
Drain no. 04 Power house nala
Drain no. 05 Moti nager nala



CHAPTER - 15
COST ESTIMATE

9.1 Rates

The Total Project cost has been arrived based on the Revised Standard Data of Government of Madhya Pradesh .The basic rates for the rate analysis are taken from the Common Standard Schedule of Rates for the year 2021-22 of Government of Madhya Pradesh. The rates not covered in SSR 2021-22 are adopted based on quotations.

9.2 Project components

Liquid waste management system planned and designed for the project area consists of sewer treatment plant, Interception and Diversion, intermittent pumping stations and necessary civil, mechanical and electrical components. Component wise summary of the cost is detailed Below

9.3 Project Cost

The proposals as outlined have been worked out into detailed cost. The cost for the proposed project of preparation of Detailed Project Reports for Liquid waste management with STPs in Balaghat Nagar Palika is detailed below. Wherein costs of each and every element necessary for taking up the work and completing the project have been considered. Details of the various Project components have been worked out and enclosed below.

CHAPTER - 10
FINANCING AND IMPLEMENTATION PLANS

For effective and time bound implementation of various components under the project, separate implementation mechanism and financial strategy have to be evolved. In the following sections a suitable implementation mechanism and financial strategy is proposed so that the project becomes self-sustaining.

The project duration period is 2 years for which the financing pattern of the same as detailed in the table:

10.1 Financing

The investment required for the proposed design and development of the area Liquid waste management system for Balaghat Nagar palika is 2.5 Crores. The Tentative

Financing plan would be:

- External Funding Agency / Share of GOI & State Government - 90 %
- Share of Balaghat Municipality - 10 %

10.2 Implementation Plan

Project Duration/Phasing:

It is proposed to complete the project in 2 years (24 Months) duration in a phased manner.

Implementing Authority:

Balaghat Nagar Palika will be the Implementing Agency. Works will be executed by registered contractors selected through tendering process.

Project Management:

The overall responsibility of the project management will be with the ULB and specifically with the Engineering Wing of Balaghat Nagar Palika. Single Combined Tender for all the Components of the total Project Scheme

BALAGHAT USED WATER SCHEME, DIST.-BALAGHAT

(Under Swachh Bharat Mission 2.0)

ECONOMICAL DESIGN OF PUMPING MAIN

IPS TO J-1

Nature of fluid: Portable Water

	Year	Discharge	
1) Water requirement :			
Initial	2026	1.86	mld
Intermediate	2040	2.19	mld
Ultimate	2055	2.53	mld
2) Length of pumping main		1640	m
3) Static head for pump		4.5	m
4) Design period		30	yrs.
5) Combined eff. of pump set		80	%
6) Cost of pumping unit		22000	Rs/kw
7) Interest rate		8.5	%
8) Life of elec. motor & pumps		15	yrs.
9) Energy charges		500	pa/unit
10) Pumping hrs.		22	hrs.
11) Residual head		5	mtrs.

INPUT DATA

PIPE DATA

NOM. DIA.MM	INTERNAL DIA.MM	TYPE/CLASS	WALL 'T' MM	HWC"	RATE Rs./m
100	100.0	DI,K7	5.0	140	1209.00
150	150.0	DI,K7	5.0	140	1686.00
200	200.0	DI,K7	5.0	140	2236.00
250	250.0	DI,K7	5.3	140	2906.00
300	300.0	DI,K7	5.6	140	3571.00
350	350.0	DI,K7	6.0	140	4465.00
400	400.0	DI,K7	6.3	140	5328.00
450	450.0	DI,K7	6.6	140	6346.00
500	500.0	DI,K7	7.0	140	7392.00
600	600.0	DI,K7	7.7	140	9765.00

SOLUTION :

	1st 15 years		2nd 15 years		IPS LEVEL	298.90
1) Discharge at installation	1.864330059	mld	2.185704672	mld	J-1	303.40
2) Discharge at the end of 15 years	2.185704672	mld	2.530033326	mld	Higest Level	-
3) Average discharge	2.025017366	mld	2.357868999	mld		
4) Ave. hours of pumping ave. discharge	20.38	hrs.	20.50	hrs.		
5) Kw required at the above combined efficiency of pumping set	0.34	*H1	0.39	*H2		
6) Annual cost (Rs.) of electrical Energy	37222.74	*Kw1	37442.47	*Kw2		

TABLE 1 - VELOCITY AND HEAD LOSS FOR DIFFERENT PIPE SIZES

Sl. No.	Pipe Size in mm.	Frictional Head loss per 1000m: 1st Stage flow	Frictional Head loss per 1000m: 2nd Stage flow	Velocity in m/sec: 1st Stage flow	Velocity in m/sec: 2nd Stage flow	Total head loss(m): 1st stage flow: Frictional loss	Total head loss(m): 1st stage flow: Other* losses	Total Head H1(m)	Total head loss(m): 2nd stage flow: Frictional loss	Total head loss(m): 2nd stage flow: Other* losses	Total Head H2(m)	Line Pressure Kg/ cm2
1.	100	108.99	142.91	3.52	4.07	178.75	17.87	206.12	234.37	23.44	267.31	26.73
2.	150	15.12	19.83	1.56	1.81	24.80	2.48	36.79	32.52	3.25	45.28	4.53
3.	200	3.73	4.88	0.88	1.02	6.11	0.61	16.22	8.01	0.80	18.31	1.83
4	250	1.26	1.65	0.56	0.65	2.06	0.21	11.77	2.70	0.27	12.47	1.25
5	300	0.52	0.68	0.39	0.45	0.85	0.08	10.43	1.11	0.11	10.72	1.07
6	350	0.24	0.32	0.29	0.33	0.40	0.04	9.94	0.52	0.05	10.08	1.01
7	400	0.13	0.17	0.22	0.25	0.21	0.02	9.73	0.27	0.03	9.80	0.98
8	450	0.07	0.09	0.17	0.20	0.12	0.01	9.63	0.15	0.02	9.67	0.97
9	500	0.04	0.06	0.14	0.16	0.07	0.01	9.58	0.09	0.01	9.60	0.96
10	600	0.02	0.02	0.10	0.11	0.03	0.00	9.53	0.04	0.00	9.54	0.95

>>>>> * Other losses = 10% of frictional loss.

TABLE 2 - KILOWATTS, COST OF PUMP SETS REQUIRED FOR DIFFERENT PIPE SIZES AND PIPE COST

			1st stage flow of				2nd stage flow of					
			2.185704672	million liters/day			2.5300333	million liters/day				
Sl. No.	Pipe Size in mm.	Class of Pipe	H1 Total head in	Kw req'd plus 100	Pump Cost @ Rs. 22000.00 per kw	Pipe Material	H2 Total head in	Kw req'd plus 100	Pump Cost @ Rs. 22000.00 per kw	Cost of pipe per unit length	Cost of entire pipeline in THS	

			meters	% Standby	in THS		meters		% Standby	in THS		(Rs.)	(Rs.)	
1.	100	DI,K7	206	139	3067	DI,K7	267		209	4604		1209	1983	
2.	150	DI,K7	37	25	547	DI,K7	45		35	780		1686	2765	
3.	200	DI,K7	16	11	241	DI,K7	18		14	315		2236	3667	
4	250	DI,K7	12	8	175	DI,K7	12		10	215		2906	4766	
5	300	DI,K7	10	7	155	DI,K7	11		8	185		3571	5856	
6	350	DI,K7	10	7	148	DI,K7	10		8	174		4465	7323	
7	400	DI,K7	10	7	145	DI,K7	10		8	169		5328	8738	
8	450	DI,K7	10	7	143	DI,K7	10		8	167		6346	10407	
9	500	DI,K7	10	6	143	DI,K7	10		8	165		7392	12123	
10	600	DI,K7	10	6	142	DI,K7	10		7	164		9765	16015	

TABLE 3 : COMPARATIVE STATEMENT OF OVERALL STRUCTURE OF PUMPING MAIN FOR DIFFERENT PIPE SIZES

			2.185704672	mld		2nd stage flow		**2.530033326**	mld.					
Sl. No.	Cost of pump sets in THS (Rs)	Annual Energy Cost in THS (Rs)	Capita-lised Energy Cost in THS (Rs)	Capita-lised Total Cost in THS (Rs)		Cost of pump sets in THS (Rs)	Annual Energy Cost in THS (Rs)	Capita-lised Energy Cost in THS (Rs)	Initial investmts for pump and Annual Energy Cost in THS (Rs)	Total of Capitalised Cost for 30 yrs. in THS (Rs)	Pipe Diameter in (mm)	Pipe Material		
1	3067.26	2594.8102	21547.92	24615.17		4604.41	3918.1956	32537.62326	10924.95	37522.89	100	DI,K7		
2	547.40	463.0842952	3845.56	4392.96		779.89	663.66274	5511.212441	1850.47	9008.47	150	DI,K7		
3	241.37	204.1932331	1695.67	1937.04		315.42	268.41049	2228.944215	748.40	6352.48	200	DI,K7		
4	175.10	148.1263305	1230.08	1405.17		214.83	182.81244	1518.117771	509.73	6680.74	250	DI,K7		
5	155.25	131.3336803	1090.63	1245.87		184.70	157.17489	1305.217483	438.24	7540.56	300	DI,K7		
6	147.92	125.1346291	1039.15	1187.07		173.58	147.71072	1226.624777	411.86	8921.52	350	DI,K7		
7	144.79	122.4851286	1017.15	1161.93		168.83	143.6657	1193.033925	400.58	10300.43	400	DI,K7		
8	143.29	121.222817	1006.66	1149.96		166.56	141.73851	1177.030108	395.20	11952.60	450	DI,K7		
9	142.52	120.5688365	1001.23	1143.75		165.39	140.74007	1168.738824	392.42	13659.05	500	DI,K7		
10	141.84	119.9948861	996.47	1138.31		164.36	139.86381	1161.462176	389.98	17542.89	600	DI,K7		

	The minimum capitalised cost observed is	**6352.478961**	
	So the most economical pipe diameter is	200	
	ECONOMICAL SIZE OF RISING MAIN IS 200 mm Dia. DI K-7		
	PROPOSED RISING MAIN 200MM DI K7 CONSIDERED AS A ECONOMIC SIZE OF RISING MAIN		

CALCULATION FOR SURGE PRESSURE:

SL No	Pipe size	Type of pipe	Wall thickness	E value for pipe	Velocity 1st stage	Velocity 2nd stage	C 1st stage	C 2nd stage	Hmax 1st stage	Hmax 2nd stage	Allowable head for pipe (including surge)	Max. Total head with	Remarks
1	100	DI,K7	5.00	17000000000	3.52	4.07	1271.6597	1271.66	455.86	527.67	125.00	794.98	
2	150	DI,K7	5.00	17000000000	1.56	1.81	1211.4794	1211.48	193.02	223.42	125.00	268.70	SAFE
3	200	DI,K7	5.00	17000000000	0.88	1.02	1159.1068	1159.11	103.88	120.24	125.00	138.55	
4	250	DI,K7	5.30	17000000000	0.56	0.65	1125.4787	1125.48	64.55	74.72	125.00	87.19	
5	300	DI,K7	5.60	17000000000	0.39	0.45	1097.8029	1097.80	43.73	50.61	125.00	61.34	
6	350	DI,K7	6.00	17000000000	0.29	0.33	1078.491	1078.49	31.56	36.53	125.00	46.61	
7	400	DI,K7	6.30	17000000000	0.22	0.25	1058.6782	1058.68	23.72	27.46	125.00	37.26	
8	450	DI,K7	6.60	17000000000	0.17	0.20	1041.583	1041.58	18.44	21.34	125.00	31.01	
9	500	DI,K7	7.00	17000000000	0.14	0.16	1030.2217	1030.22	14.77	17.10	125.00	26.70	

CALCULATION FOR SURGE PRESSURE:

SL No	Pipe size	Type of pipe	Wall thickness	E value for pipe	Velocity 1st stage	Velocity 2nd stage	C 1st stage	C 2nd stage	Hmax 1st stage	Hmax 2nd stage	Allowable head for pipe (including surge)	Max. Total head with	Remarks
1	100	DI,K9	6.00	17000000000	3.52	4.07	1293.8045	1293.80	463.80	536.86	770.00	804.17	
2	150	DI,K9	6.00	17000000000	1.56	1.81	1240.4761	1240.48	197.64	228.77	770.00	274.05	SAFE
3	200	DI,K9	6.30	17000000000	0.88	1.02	1201.8226	1201.82	107.71	124.67	740.00	142.99	
4	250	DI,K9	6.80	17000000000	0.56	0.65	1175.3012	1175.30	67.41	78.03	650.00	90.50	
5	300	DI,K9	7.20	17000000000	0.39	0.45	1151.0213	1151.02	45.85	53.07	590.00	63.79	
6	350	DI,K9	7.70	17000000000	0.29	0.33	1133.2569	1133.26	33.16	38.39	540.00	48.46	
7	400	DI,K9	8.10	17000000000	0.22	0.25	1115.6765	1115.68	25.00	28.93	510.00	38.74	
8	450	DI,K9	8.60	17000000000	0.17	0.20	1103.0291	1103.03	19.53	22.60	480.00	32.27	
9	500	DI,K9	9.00	17000000000	0.14	0.16	1089.631	1089.63	15.62	18.09	460.00	27.69	

DESIGN OF FIRST STAGE PUMP AT IPS-1

Total Head in 'm' at the end of first stage		11.00
Discharge at first stage in MLD		1.86
Hour of Pumping		22.00
Discharge in lps		23.54
	Say	24.00
Combined efficiency of motor & pump 'n'		0.70
HP of pump = QH /(75n)		4.93
	Say HP	5.00
Provide 2 pumps each of KW		3.73
(with 100% as stand by)	Say	4.00
	HP	**5.36**
	Say	**6**

Provide two nos. of pump at Ist Stage(1 working+1 standby) of each of 6 HP having discharge 24 LPS & Head 11m

BALAGHAT USED WATER SCHEME, DIST.-BALAGHAT

(Under Swachh Bharat Mission 2.0)

ECONOMICAL DESIGN OF PUMPING MAIN

IPS TO J-1 — **INPUT DATA**

Nature of fluid: Portable Water

1) Water requirement :	Year	Discharge	
Initial	2026	0.58	mld
Intermediate	2040	0.68	mld
Ultimate	2055	0.79	mld
2) Length of pumping main		1230	m
3) Static head for pump		7	m
4) Design period		30	yrs.
5) Combined eff. of pump set		80	%
6) Cost of pumping unit		22000	Rs/kw
7) Interest rate		8.5	%
8) Life of elec. motor & pumps		15	yrs.
9) Energy charges		500	pa/unit
10) Pumping hrs.		22	hrs.
11) Residual head		5	mtrs.

PIPE DATA

NOM. DIA.MM	INTERNAL DIA.MM	TYPE/CLASS	WALL 'T' MM	HWC"	RATE Rs./m
100	100.0	DI,K7	5.0	140	1209.00
150	150.0	DI,K7	5.0	140	1686.00
200	200.0	DI,K7	5.0	140	2236.00
250	250.0	DI,K7	5.3	140	2906.00
300	300.0	DI,K7	5.6	140	3571.00
350	350.0	DI,K7	6.0	140	4465.00
400	400.0	DI,K7	6.3	140	5328.00
450	450.0	DI,K7	6.6	140	6346.00
500	500.0	DI,K7	7.0	140	7392.00
600	600.0	DI,K7	7.7	140	9765.00

SOLUTION :

	1st 15 years		2nd 15 years		
1) Discharge at installation	0.5797657	mld	0.679706146	mld	IPS LEVEL 315.00
2) Discharge at the end of 15 years	0.679706146	mld	0.786784795	mld	J-1 322.00
3) Average discharge	0.629735923	mld	0.73324547	mld	Higest Level -
4) Ave. hours of pumping ave. discharge	20.38	hrs.	20.50	hrs.	
5) Kw required at the above combined efficiency of pumping set	0.11	*H1	0.12	*H2	
6) Annual cost (Rs.) of electrical Energy	37222.74	*Kw1	37442.47	*Kw2	

TABLE 1 - VELOCITY AND HEAD LOSS FOR DIFFERENT PIPE SIZES

Sl. No.	Pipe Size in mm.	Frictional Head loss per 1000m: 1st Stage flow	Frictional Head loss per 1000m: 2nd Stage flow	Velocity in m/sec: 1st Stage flow	Velocity in m/sec: 2nd Stage flow	Total head loss(m): 1st stage flow: Frictional loss	Total head loss(m): 1st stage flow: Other* losses	Total Head H1(m)	Total head loss(m): 2nd stage flow: Frictional loss	Total head loss(m): 2nd stage flow: Other* losses	Total Head H2(m)	Line Pressure Kg/ cm2
1.	100	12.53	16.43	1.09	1.27	15.41	1.54	28.95	20.21	2.02	34.23	3.42
2.	150	1.74	2.28	0.49	0.56	2.14	0.21	14.35	2.80	0.28	15.08	1.51
3.	200	0.43	0.56	0.27	0.32	0.53	0.05	12.58	0.69	0.07	12.76	1.28
4	250	0.14	0.19	0.17	0.20	0.18	0.02	12.20	0.23	0.02	12.26	1.23
5	300	0.06	0.08	0.12	0.14	0.07	0.01	12.08	0.10	0.01	12.11	1.21
6	350	0.03	0.04	0.09	0.10	0.03	0.00	12.04	0.05	0.00	12.05	1.20
7	400	0.01	0.02	0.07	0.08	0.02	0.00	12.02	0.02	0.00	12.03	1.20
8	450	0.01	0.01	0.05	0.06	0.01	0.00	12.01	0.01	0.00	12.01	1.20
9	500	0.00	0.01	0.04	0.05	0.01	0.00	12.01	0.01	0.00	12.01	1.20
10	600	0.00	0.00	0.03	0.04	0.00	0.00	12.00	0.00	0.00	12.00	1.20

>>>>> * Other losses = 10% of frictional loss.

TABLE 2 - KILOWATTS, COST OF PUMP SETS REQUIRED FOR DIFFERENT PIPE SIZES AND PIPE COST

1st stage flow of **0.679706146** million liters/day — 2nd stage flow of **0.7867848** million liters/day

Sl. No.	Pipe Size in mm.	Class of Pipe	H1 Total head in	Kw req'd plus 100	Pump Cost @ Rs. 22000.00 per kw	Pipe Material	H2 Total head in	Kw req'd plus 100	Pump Cost @ Rs. 22000.00 per kw	Cost of pipe per unit length	Cost of entire pipeline in THS

			meters	% Standby	in THS		meters		% Standby	in THS		(Rs.)	(Rs.)	
1.	100	DI,K7	29	6	134	DI,K7	34		8	183		1209	1487	
2.	150	DI,K7	14	3	66	DI,K7	15		4	81		1686	2074	
3.	200	DI,K7	13	3	58	DI,K7	13		3	68		2236	2750	
4	250	DI,K7	12	3	56	DI,K7	12		3	66		2906	3574	
5	300	DI,K7	12	3	56	DI,K7	12		3	65		3571	4392	
6	350	DI,K7	12	3	56	DI,K7	12		3	65		4465	5492	
7	400	DI,K7	12	3	56	DI,K7	12		3	64		5328	6553	
8	450	DI,K7	12	3	56	DI,K7	12		3	64		6346	7806	
9	500	DI,K7	12	3	56	DI,K7	12		3	64		7392	9092	
10	600	DI,K7	12	3	56	DI,K7	12		3	64		9765	12011	

TABLE 3 : COMPARATIVE STATEMENT OF OVERALL STRUCTURE OF PUMPING MAIN FOR DIFFERENT PIPE SIZES

			0.679706146	mld		2nd stage flow		**0.786784795**	mld.					
Sl. No.	Cost of pump sets in THS (Rs)	Annual Energy Cost in THS (Rs)	Capita-lised Energy Cost in THS (Rs)	Capita-lised Total Cost in THS (Rs)		Cost of pump sets in THS (Rs)	Annual Energy Cost in THS (Rs)	Capita-lised Energy Cost in THS (Rs)	Initial investmts for pump and Annual Energy Cost in THS (Rs)	Total of Capitalised Cost for 30 yrs. in THS (Rs)	Pipe Diameter in (mm)	Pipe Material		
1	133.98	113.3431735	941.23	1075.21		183.35	156.02028	1295.629294	435.03	2997.30	100	DI,K7		
2	66.42	56.18770658	466.60	533.01		80.80	68.760304	571.0018331	191.72	2798.52	150	DI,K7		
3	58.21	49.24636412	408.95	467.17		68.35	58.162869	482.998224	162.17	3379.62	200	DI,K7		
4	56.44	47.743108	396.47	452.91		65.65	55.867829	463.9396681	155.77	4183.06	250	DI,K7		
5	55.90	47.29286637	392.73	448.63		64.84	55.180439	458.2314223	153.86	4994.82	300	DI,K7		
6	55.71	47.12665847	391.35	447.06		64.55	54.926688	456.1242083	153.15	6092.16	350	DI,K7		
7	55.62	47.05562052	390.76	446.38		64.42	54.818233	455.2235762	152.85	7152.67	400	DI,K7		
8	55.58	47.02177564	390.48	446.06		64.36	54.766562	454.7944846	152.70	8404.35	450	DI,K7		
9	55.56	47.00424123	390.33	445.90		64.33	54.739792	454.5721801	152.63	9690.69	500	DI,K7		
10	55.54	46.98885257	390.21	445.75		64.30	54.716298	454.3770799	152.56	12609.26	600	DI,K7		

	The minimum capitalised cost observed is	**2798.515715**	
	So the most economical pipe diameter is	150	
	ECONOMICAL SIZE OF RISING MAIN IS 150 mm Dia. DI K-7		
	PROPOSED RISING MAIN 200MM DI K7 CONSIDERED AS A ECONOMIC SIZE OF RISING MAIN		

CALCULATION FOR SURGE PRESSURE:

SL No	Pipe size	Type of pipe	Wall thickness	E value for pipe	Velocity 1st stage	Velocity 2nd stage	C 1st stage	C 2nd stage	Hmax 1st stage	Hmax 2nd stage	Allowable head for pipe (including surge)	Max. Total head with	Remarks
1	100	DI,K7	5.00	17000000000	1.09	1.27	1271.6597	1271.66	141.76	164.10	125.00	198.32	
2	150	DI,K7	5.00	17000000000	0.49	0.56	1211.4794	1211.48	60.02	69.48	125.00	84.56	SAFE
3	200	DI,K7	5.00	17000000000	0.27	0.32	1159.1068	1159.11	32.30	37.39	125.00	50.15	
4	250	DI,K7	5.30	17000000000	0.17	0.20	1125.4787	1125.48	20.07	23.24	125.00	35.49	
5	300	DI,K7	5.60	17000000000	0.12	0.14	1097.8029	1097.80	13.60	15.74	125.00	27.85	
6	350	DI,K7	6.00	17000000000	0.09	0.10	1078.491	1078.49	9.81	11.36	125.00	23.41	
7	400	DI,K7	6.30	17000000000	0.07	0.08	1058.6782	1058.68	7.38	8.54	125.00	20.56	
8	450	DI,K7	6.60	17000000000	0.05	0.06	1041.583	1041.58	5.73	6.64	125.00	18.65	
9	500	DI,K7	7.00	17000000000	0.04	0.05	1030.2217	1030.22	4.59	5.32	125.00	17.33	

CALCULATION FOR SURGE PRESSURE:

SL No	Pipe size	Type of pipe	Wall thickness	E value for pipe	Velocity 1st stage	Velocity 2nd stage	C 1st stage	C 2nd stage	Hmax 1st stage	Hmax 2nd stage	Allowable head for pipe (including surge)	Max. Total head with	Remarks
1	100	DI,K9	6.00	17000000000	1.09	1.27	1293.8045	1293.80	144.23	166.95	770.00	201.18	
2	150	DI,K9	6.00	17000000000	0.49	0.56	1240.4761	1240.48	61.46	71.14	770.00	86.23	SAFE
3	200	DI,K9	6.30	17000000000	0.27	0.32	1201.8226	1201.82	33.49	38.77	740.00	51.53	
4	250	DI,K9	6.80	17000000000	0.17	0.20	1175.3012	1175.30	20.96	24.27	650.00	36.52	
5	300	DI,K9	7.20	17000000000	0.12	0.14	1151.0213	1151.02	14.26	16.50	590.00	28.61	
6	350	DI,K9	7.70	17000000000	0.09	0.10	1133.2569	1133.26	10.31	11.94	540.00	23.99	
7	400	DI,K9	8.10	17000000000	0.07	0.08	1115.6765	1115.68	7.77	9.00	510.00	21.02	
8	450	DI,K9	8.60	17000000000	0.05	0.06	1103.0291	1103.03	6.07	7.03	480.00	19.04	
9	500	DI,K9	9.00	17000000000	0.04	0.05	1089.631	1089.63	4.86	5.62	460.00	17.63	

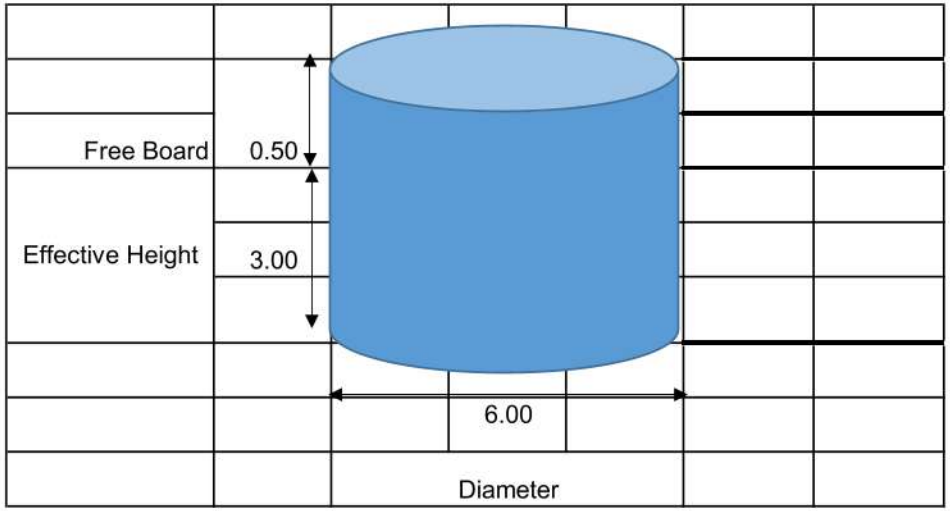
DESIGN OF FIRST STAGE PUMP AT IPS-3

Total Head in 'm' at the end of first stage		14.35
Discharge at first stage in MLD		0.68
Hour of Pumping		22.00
Discharge in lps		8.58
	Say	9.00
Combined efficiency of motor & pump 'n'		0.70
HP of pump = QH /(75n)		2.35
	Say HP	3.00
Provide 2 pumps each of KW		2.24
(with 100% as stand by)	Say	3.00
	HP	**4.02**
	Say	**5**

Provide two nos. of pump at Ist Stage(1 working+1 standby) of each of 5 HP having discharge 9 LPS & Head 14.3524868829638m

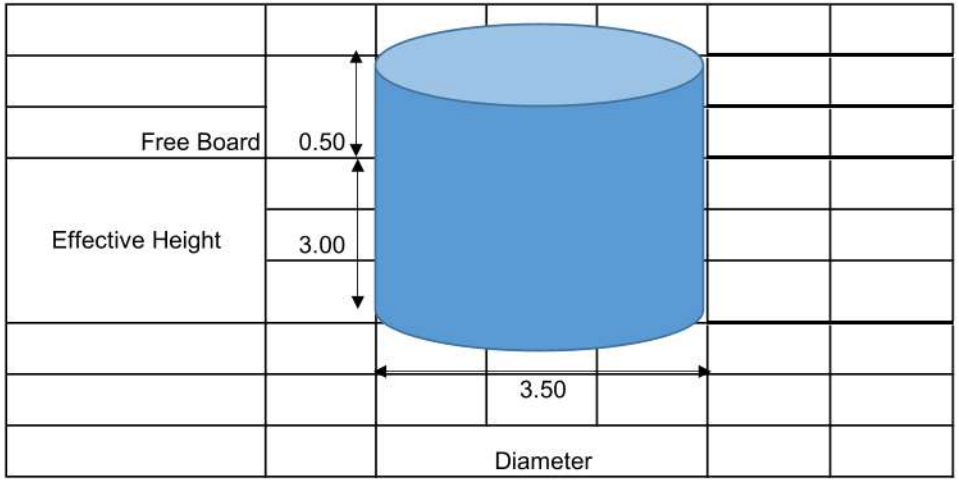
1	***Sump well at IPS-1***			
	Assume 30 min capacity			
	Total quantity of water	=	2.60	MLD
	Volume required	=	54166.70	lit
	Say Volume required	=	55000.00	lit
		or	55.00	m^3
	Proposing 80KL Capacity of sump		80.00	m^3
	Assuming effective Water Depth	=	3.00	m
	Area required	=	26.67	m^2
	Required Diameter	=	5.83	m
	Provide diameter	=	6.00	m

Detention Time	30	min.
Ultimate Year Water Demand	2600	KLD
GL of Sump	318	m



1	***Sump well at IPS-2***			
	Assume 30 min capacity			
	Total quantity of water	=	0.60	MLD
	Volume required	=	12500.00	lit
	Say Volume required	=	13000.00	lit
		or	13.00	m^3
	Proposing 25 KL Capacity of sump		25.00	m^3
	Assuming effective Water Depth	=	3.00	m
	Area required	=	8.33	m^2
	Required Diameter	=	3.26	m
	Provide diameter	=	3.50	m

Detention Time	30 min.
Ultimate Year Water Demand	600 KLD
GL of Sump	327 m



कार्यालय नगरपालिका परिषद बालाघाट
जिला बालाघाट (म.प्र.)
Phone No. 07632-241377 E-mail cmobalaghat@mpurbun.gov.in

//प्रमाण पत्र//

प्रमाणित किया जाता है कि नगरपालिका परिषद बालाघाट जिला बालाघाट क्षेत्रांतर्गत शासन की योजना अंतर्गत लिक्वीड वेस्ट मेनेजमेन्ट हेतु सीवरेज ट्रीटमेन्ट प्लांट नगरपालिका परिषद बालाघाट को आवंटित भूमि निम्नानुसार है–

1. STP साईट नं.1 ए.एच.पी. (प्रधान मंत्री आवास) भटेरा शासकीय भूमि खसरा नं. 2/11 रक्बा 0.1340 हेक्ट.
2. STP साईट नं.2 बुढी तालाब शासकीय भूमि नजूल खसरा नं. 42 रक्बा 0.5260 हेक्ट.
3. STP साईट नं.3 मोती तालाब शासकीय भूमि खसरा नं. 354(S) रक्बा 2.3670 हेक्ट.
4. STP साईट नं.4 गोंगलाई शासकीय भूमि खसरा नं.2/9/2/2 एस.टी.पी. रक्बा 1.5580 हेक्ट.

उपरोक्त उल्लेखित खसरा/नजूल शीट भूमि पर STP (Severag treatment plant) निर्माण कार्य किया जाना प्रस्तावित है।

मुख्य नगरपालिका अधिकारी
नगरपालिका परिषद बालाघाट

मध्यप्रदेश कम्प्यूटरीकृत भू-अभिलेख

खसरा

प्ररूप एक (नियम 6 देखिए)

मध्यप्रदेश भू-राजस्व संहिता (भू-सर्वेक्षण तथा भू-अभिलेख) नियम, 2020

ग्राम:भटेरा			पटवारी हल्का:भटेरा			तहसील:बालाघाट			जिला:बालाघाट		वर्ष: 2024-2025
भूमि के भाग की यूनिक आईडी	भूमि के भाग का प्रकार (सर्वेक्षण संख्यांक/ ब्लॉक संख्यांक)	भू-खण्ड संख्यांक(ब्लॉक की दशा में)	1. क्षेत्रफल (हेक्टेयर/ वर्ग मीटर में) 2. भूमि उपयोग जिसके लिए निर्धारण किया गया है 3. भू-राजस्व/ भू-भाटक (रु. में)	1. भूमिस्वामी का नाम, उसकी माता/ पिता/पति का नाम तथा निवास का पता 2. शासकीय भूमि	प्रत्येक भूमिस्वामी का अंश	1. सरकारी पट्टेदार का नाम, उसकी माता/ पिता/ पति का नाम तथा निवास का पता 2. पट्टे की अवधि 3. पट्टे के अधीन क्षेत्र	मौरूषी कृषक (यदि कोई हो) का नाम, उसकी माता/ पिता/ पति का नाम तथा निवास का पता	भूमि पर विल्लंगम तथा प्रभार 1. बंधक 2. दृष्टिबंधक 3. भू-अर्जन प्रक्रियाधीन	फसल के ब्यौरे		1. भूमि के सिंचाई संबंधी प्रास्थिति 2. भूमि पर संरचना / वृक्ष 3. अन्य अभियुक्तियाँ 4. वर्ष के दौरान कॉलम संख्या (1) से (9) तक में प्रविष्टियों में सुधार के आदेश
									फसल 1. खरीफ 2. रबी 3. जायद 4. अन्य	फसल के अधीन क्षेत्रफल	
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1002053046 7DQN1EDD5H41H0	2/1 (S)		0.1340 हेक्टेयर	(शासकीय) मध्यप्रदेश शासन शासकीय	1						सरकार घांस

			चरागाह .134भू-जल 0.0000								
			रु.0.00								

नोट :-

1. यह प्रपत्र केवल प्रार्थी की जानकारी के लिये है |
2. इसका उपयोग किसी भी न्यायालय में साक्ष्य के रूप में नही किया जा सकता है |
3. डिजिटली साइंड कॉपी के लिए लोक सेवा केंद्र से, एम. पी. ऑनलाइन से अथवा ऑनलाइन आवेदन करें |
4. प्रविष्टियों में सुधार/संशोधन हेतु संबंधित जिला/तहसील कार्यालय में संपर्क करें |

प्रिंट

मध्यप्रदेश कम्प्यूटरीकृत भू-अभिलेख

नक़्शा की प्रतिलिपि

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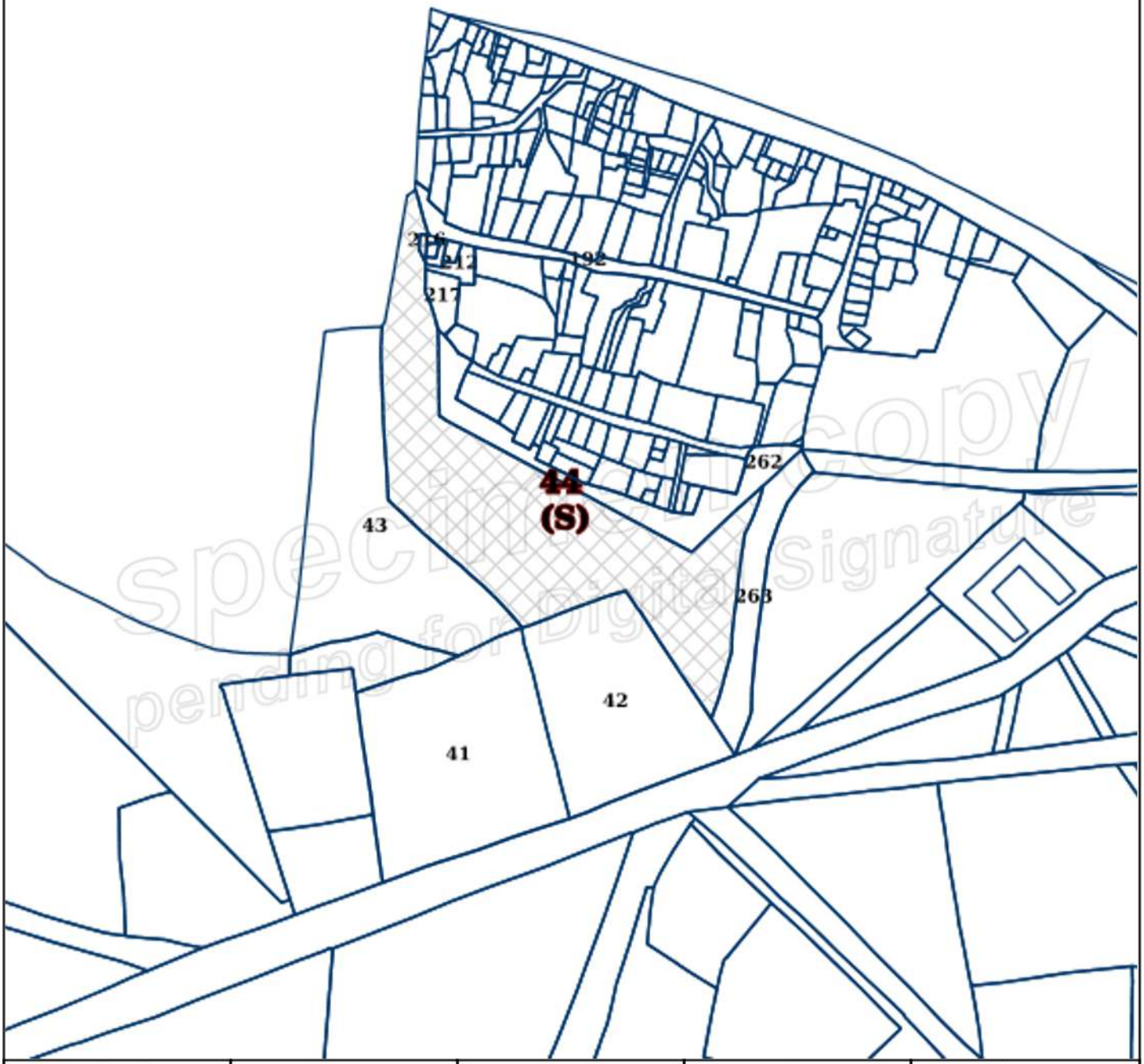
N W E S



ब्लॉक सं.	ग्राम	हल्का	तहसील	जिला
	बालाघाट नजुल	बूढ़ी बाला0नजूल	बालाघाट	बालाघाट
सर्वेक्षण सं.	क्षेत्रफल	भू-राजस्व	मापांक 1:4000 (पृष्ठ आकार A4)	
44(S)	0.0000(हेक्ट.)	0.00	0 20 40 60 80 120 160 200m	

भूस्वामी : मध्यप्रदेश शासन शासकीय

(हस्ताक्षर)

नोट :-
1. यह प्रपत्र केवल प्रार्थी की जानकारी के लिये है।
2. इसका उपयोग किसी भी न्यायालय में साक्ष्य के रूप में नही किया जा सकता है।
3. डिजिटली साइंड कॉपी के लिए आई. टी. सेंटर से अथवा ऑनलाइन आवेदन करें।

मध्यप्रदेश कम्प्यूटरीकृत भू-अभिलेख

नक़्शा की प्रतिलिपि

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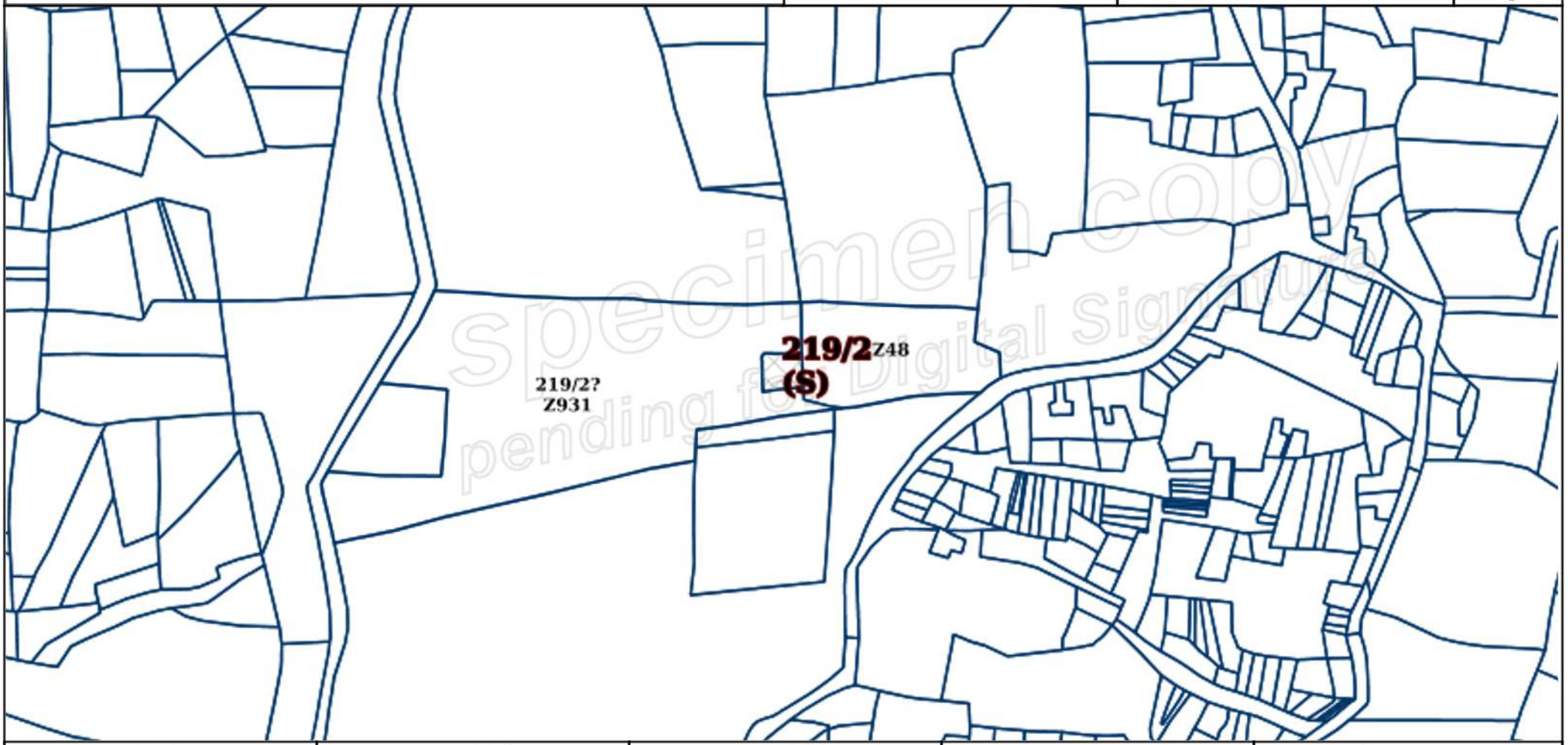


ब्लॉक सं.:	ग्राम:गोगंलई	हल्का:गोगंलई	तहसील:बालाघाट	जिला:बालाघाट
सर्वेक्षण सं.: 219/2(S)	क्षेत्रफल:0.5260(हेक्ट.)	भू-राजस्व:0	मापांक 1:4000 (पृष्ठ आकार A4)	0 20 40 60 80 100 120 160m

भूस्वामी : (शासकीय) मध्यप्रदेश शासन शासकीय

(हस्ताक्षर)

नोट :-
1. यह प्रपत्र केवल प्रार्थी की जानकारी के लिये है |
2. इसका उपयोग किसी भी न्यायालय में साक्ष्य के रूप में नही किया जा सकता है |
3. डिजिटली साइंड कॉपी के लिए आई. टी. सेंटर से अथवा ऑनलाइन आवेदन करें |

मध्यप्रदेश कम्प्यूटरीकृत भू-अभिलेख

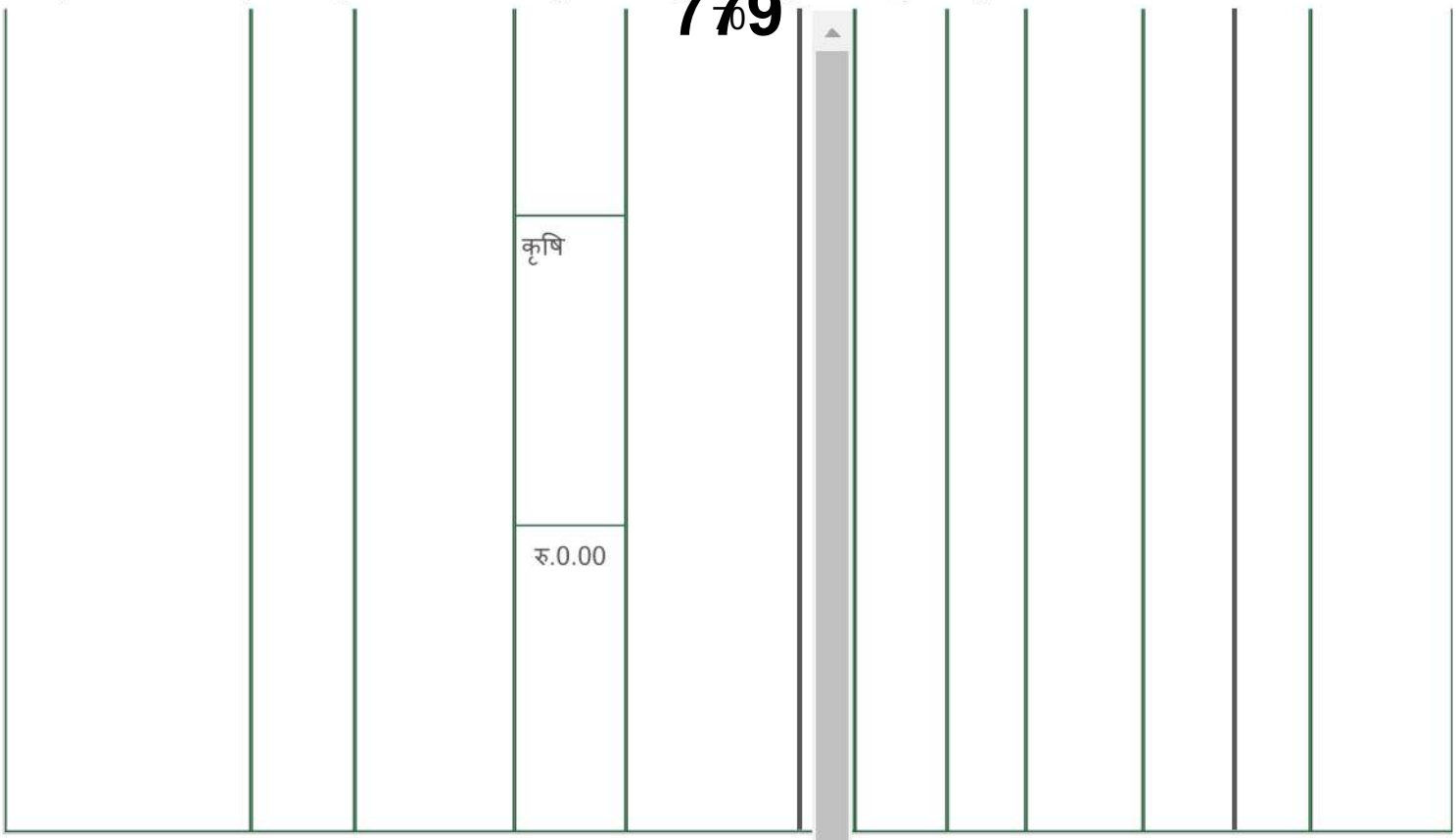
खसरा

प्ररूप एक (नियम 6 देखिए)

मध्यप्रदेश भू-राजस्व संहिता (भू-सर्वेक्षण तथा भू-अभिलेख) नियम, 2020

ग्राम:बालाघाट नजुल			पटवारी हल्का:बूढ़ी बाला0नजूल			तहसील:बालाघाट			जिला:बालाघाट		वर्ष: 2024-2025
भूमि के भाग की यूनिक आईडी	भूमि के भाग का प्रकार (सर्वेक्षण संख्यांक/ ब्लॉक संख्यांक)	भू-खण्ड संख्यांक(ब्लॉक की दशा में)	1. क्षेत्रफल (हेक्टेयर/ वर्ग मीटर में) 2. भूमि उपयोग जिसके लिए निर्धारण किया गया है 3. भू-राजस्व/ भू-भाटक (रु. में)	1. भूमिस्वामी का नाम, उसकी माता/ पिता/पति का नाम तथा निवास का पता 2. शासकीय भूमि	प्रत्येक भूमिस्वामी का अंश	1. सरकारी पट्टेदार का नाम, उसकी माता/ पिता/ पति का नाम तथा निवास का पता 2. पट्टे की अवधि 3. पट्टे के अधीन क्षेत्र	मौरुषी कृषक (यदि कोई हो) का नाम, उसकी माता/ पिता/ पति का नाम तथा निवास का पता	भूमि पर विल्लगम तथा प्रभार 1. बंधक 2. दृष्टिबंधक 3. भू-अर्जन प्रक्रियाधीन	फसल के ब्यौरे		1. भूमि के सिंचाई संबंधी प्रास्थिति 2. भूमि पर संरचना /वृक्ष 3. अन्य अभियुक्तियाँ 4. वर्ष के दौरान कॉलम संख्या (1) से (9) तक में प्रविष्टियों में सुधार के आदेश
									फसल 1. खरीफ 2. रबी 3. जायद 4. अन्य	फसल के अधीन क्षेत्रफल	
1	2	3	4	5	6	7	8	9	10	11	12
1054374783 7DPY28DD5J2LH0	44 (S)		0.0000 हेक्टेयर	मध्यप्रदेश शासन शासकीय							शा.न.देखो खसरा नजूल में,खसरा न.44 से 159 तक

779



नोट :-

1. यह प्रपत्र केवल प्रार्थी की जानकारी के लिये है ।
2. इसका उपयोग किसी भी न्यायालय में साक्ष्य के रूप में नही किया जा सकता है ।
3. डिजिटली साइंड कॉपी के लिए लोक सेवा केंद्र से, एम. पी. ऑनलाइन से अथवा ऑनलाइन आवेदन करें ।
4. प्रविष्टियों में सुधार/संशोधन हेतु संबंधित जिला/तहसील कार्यालय में संपर्क करें ।

प्रिंट

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मध्यप्रदेश कम्प्यूटरीकृत भू-अभिलेख

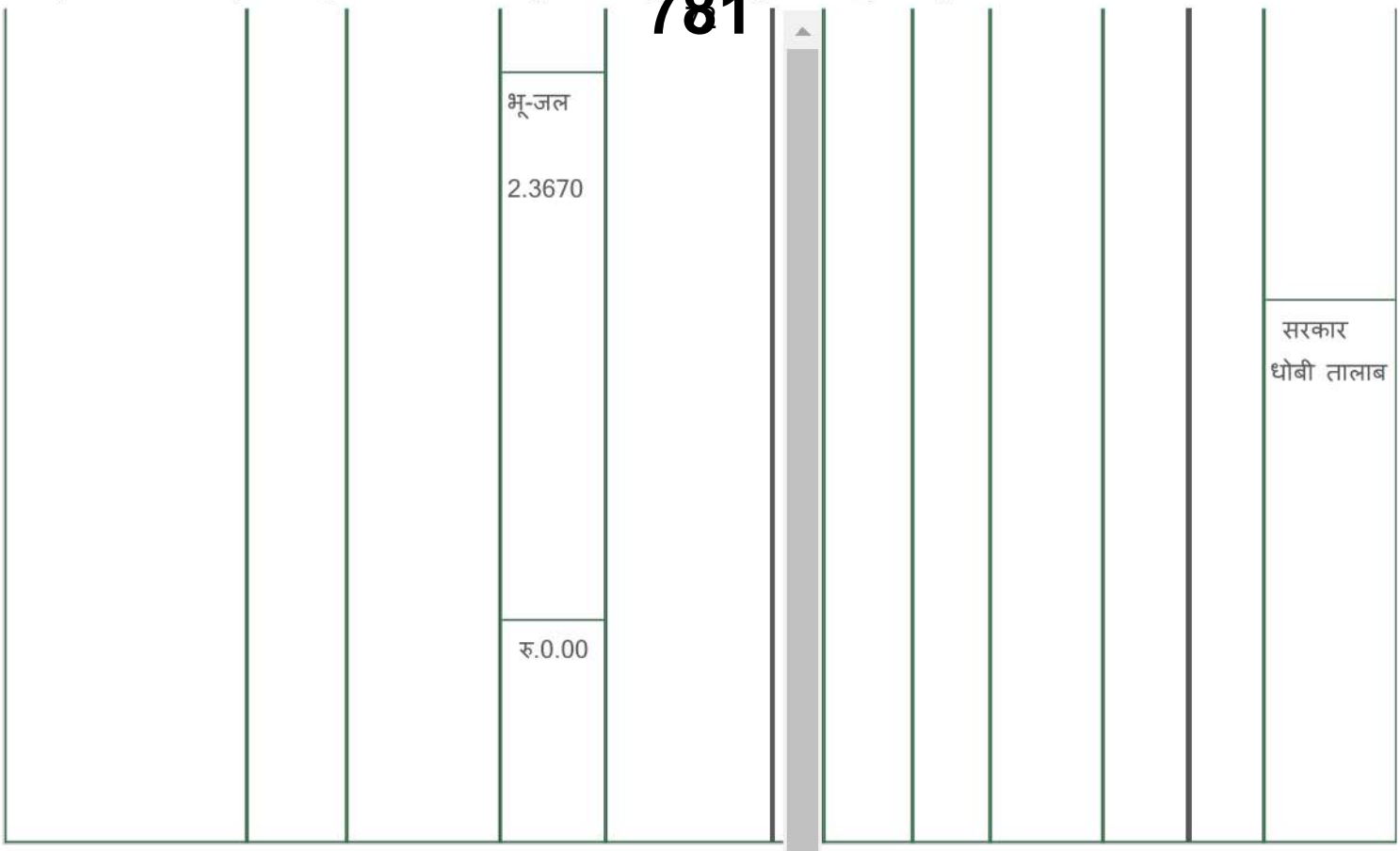
खसरा

प्ररूप एक (नियम 6 देखिए)

मध्यप्रदेश भू-राजस्व संहिता (भू-सर्वेक्षण तथा भू-अभिलेख) नियम, 2020

ग्राम:बालाघाट नजुल			पटवारी हल्का:बूढ़ी बाला0नजूल			तहसील:बालाघाट			जिला:बालाघाट		वर्ष: 2024-2025
भूमि के भाग की यूनिक आईडी	भूमि के भाग का प्रकार (सर्वेक्षण संख्यांक/ ब्लॉक संख्यांक)	भू-खण्ड संख्यांक(ब्लॉक की दशा में)	1. क्षेत्रफल (हेक्टेयर/ वर्ग मीटर में) 2. भूमि उपयोग जिसके लिए निर्धारण किया गया है 3. भू-राजस्व/ भू-भाटक (रु. में)	1. भूमिस्वामी का नाम, उसकी माता/ पिता/पति का नाम तथा निवास का पता 2. शासकीय भूमि	प्रत्येक भूमिस्वामी का अंश	1. सरकारी पट्टेदार का नाम, उसकी माता/ पिता/ पति का नाम तथा निवास का पता 2. पट्टे की अवधि 3. पट्टे के अधीन क्षेत्र	मौरुषी कृषक (यदि कोई हो) का नाम, उसकी माता/ पिता/ पति का नाम तथा निवास का पता	भूमि पर विल्लंगम तथा प्रभार 1. बंधक 2. दृष्टिबंधक 3. भू-अर्जन प्रक्रियाधीन	फसल के ब्यौरे		1. भूमि के सिंचाई संबंधी प्रास्थिति 2. भूमि पर संरचना /वृक्ष 3. अन्य अभियुक्तियाँ 4. वर्ष के दौरान कॉलम संख्या (1) से (9) तक में प्रविष्टियों में सुधार के आदेश
									फसल 1. खरीफ 2. रबी 3. जायद 4. अन्य	फसल के अधीन क्षेत्रफल	
1	2	3	4	5	6	7	8	9	10	11	12
1296192734 7DP5FJDD5NS5H0	354 (S)		2.3670 हेक्टेयर	(शासकीय) मध्यप्रदेश शासन शासकीय							तालाब शासकीय 1,निजी 1

781



नोट :-

1. यह प्रपत्र केवल प्रार्थी की जानकारी के लिये है |
2. इसका उपयोग किसी भी न्यायालय में साक्ष्य के रूप में नही किया जा सकता है |
3. डिजिटली साइंड कॉपी के लिए लोक सेवा केंद्र से, एम. पी. ऑनलाइन से अथवा ऑनलाइन आवेदन करें |
4. प्रविष्टियों में सुधार/संशोधन हेतु संबंधित जिला/तहसील कार्यालय में संपर्क करें |

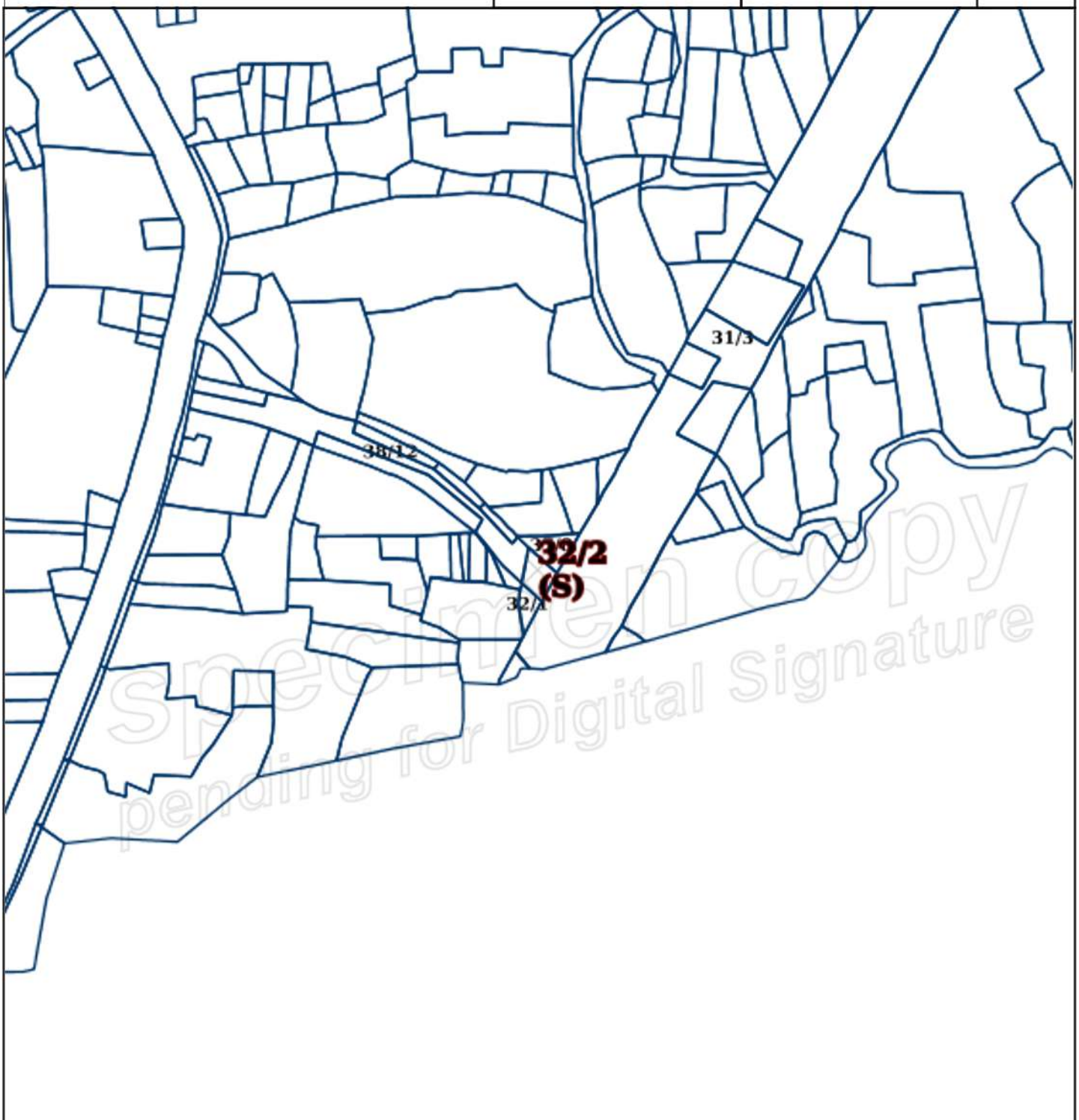
प्रिंट

मध्यप्रदेश कम्प्यूटरीकृत भू-अभिलेख

नक़्शा की प्रतिलिपि

वर्ष: 2025-26 | दिनांक: 29-05-2025 17:29:28

N W E S



ब्लॉक सं.	ग्राम	हल्का	तहसील	जिला
	नवेगांव	नवेगांव	बालाघाट	बालाघाट
सर्वेक्षण सं.	क्षेत्रफल	भू-राजस्व	मापांक 1:4000 (पृष्ठ आकार A4)	
32/2(S)	0.0450(हेक्ट.)	0.00	0 20 40 60 80 120 160 200m	

भूस्वामी : (शासकीय) मध्यप्रदेश शासन शासकीय

(हस्ताक्षर)

नोट :-
1. यह प्रपत्र केवल प्रार्थी की जानकारी के लिये है |
2. इसका उपयोग किसी भी न्यायालय में साक्ष्य के रूप में नही किया जा सकता है |
3. डिजिटली साइंड कॉपी के लिए आई. टी. सेंटर से अथवा ऑनलाइन आवेदन करें |

Abstract of Cost		
S.No.	**Discription of item**	**Amount lacs**
1	Construction of Drain 3723m	283.44
2	Providing and laying NP3 Pipe Having total length of 315 m & Dia 350mm	10.60
3	Canal lining work In Existing nallah 8895 mtr.	545.44
3	Construction Of nallah 2530 mtr.	430.33
4	Construction of Weir Wall 4 nos.	74.84
5	Pumping Station 2nos	21.00
6	Providing and laying (DI K-7) from Proposed STP, Having total length of 2855 m Dia 150 & 300mm	137.49
7	Sump for waste water	6.84
8	Construction Of Sewage treatment plant 4 nos.	1442.65
9	Earth work For STP Site	6.28
10	Installation of Sub Station	14.80
11	Providing and laying of 11KV HT Feeder Connection upto Sewerage Treatment Plant.	35.70
12	Solar Panel of all STP site	38.87
13	Reuse collection Sump well for storage of Treated Water	33.85
Project Cost		**3082.13**
GST 18%		**554.78**
Total Project Cost with GST		**3636.91**
Cost of CSAP 3B		**3636**

Estimate for Bath- 01										
S.no	**Referance**	**Description of Item**	**Nos**	**L**	**B**	**D/H**	**Quantity**	**Unit**	**Rate**	**Amount**
			DR1	528						
			DR2	340.00						
			DR3	800.00						
			DR4	165.00						
			DR5	1330.00						
			DR6	560.00						
1	UADD SOR Vol.I Clause No.18.2 Pg. no. 230	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	1	3723	1.4	1.40	7297.08	Cum	151	1101859.08
	V-II	**(Item No.- 2.18)**								
	2.18/pg-19	Supplying and filling in plinth under floors including, watering, ramming consolidating and dressing complete.								
	2.18.2	MOORUM/HARD COPRA								
			1	3723	1.4	0.10	521.22	Cum	478	249143.16
		PCC								
2	UADD SOR Vol.I Clause No.18.14 Pg. no. 232	Providing and laying in position Plain cement concrete (PCC) of specified grade excluding the cost of centering and shuttering								
	18.14.7	Cement concrete grade M-10 (Nominal Mix) with 40 mm maximum size of stone aggregate	1	3723	1.4	0.15	781.83	Cum	4112	3214884.96
3	UADD SOR Vol.II Clause No.5.5 Pg. no. 46	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 :								
	5.1.1	Cement concrete grade M-20 (NominalMix) with 20mm maximum size of stone aggregate.								
		For Base	1	3723	1.2	0.15	670.14			
		For Wall	2	3723	0.15	1	1116.90			
						Total	**1787.04**	Cum	**5435**	9712562
4	UADD Buliding SOR Vol.II Clause No.19 Pg. no. 211	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	2	3723		0.15	1116.90	Sq.M	160	178704
	19.1.2	Walls(anythickness)including attached pilasters, butteresses, plinth and string courses etc	4	3723		1	14892.00			
			1	373	1.2	-	447.60			
							15339.60	Sq.M	289	4433144
5	**V-II,5.11**	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.								
	5.11.4	Thermo-Mechanically Treated bars. (Fe 500 D or more)	**1787**	90	Kg/Cum		160833.60	KG	58	9328348.8

		V-III, 87 PAGE								
	13.8	Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia AC/PVC/HDPE pipe, extending through the full width of the structure with slope of 1V :20H towards drawing foce. Complete as per drawing and Technical specifications and as per clause 2706 of specifications.								
				3723						
		side wall	2	1812	0.2		724.8	R.M	173.00	**125390.4**
										28344037.20
Total Cost of RCC Channel										283.44

GRAVITY MAIN ESTIMATE										
		TOTAL LENGTH	315	M		TOTAL AMOUNT			10.60	LACS
S.NO.	SOR	PARTICULARS	NO	L	W	H/D	QUTY	RATE	UNIT	AMT (InRs.)
1	V-1 Pg-227 18.2	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 Kind of soil								
			1	315	1.3	2.80	1146.6			
							1146.60	151.00	cum	173136.60
	18.2.2	Ordinary rock								
			1	315.00	1.30	1.20	491.4			
							491.40	261.00	cum	128255.40
3	**18.3.3**	Filling with moorum for pipe bedding or over the pipe including supply of moorum/sand.								
			1	315	1.3	0.15	61.43	720.0	cum	44226.00
4	V-1 Pg-155 I.NO 12.3	12.3 Providing and Laying non-pressure (NP3) RCC socket & spigot pipes with rubber gasket joint including testing of joints.								
		Dia								
	12.3.5	350 mm dia pipe	1	315			315.00	1662	RMT	523530.00
				315						
5	V-1 Pg-211 I.NO.-17.4	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/ cm2 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								
			8				8.00	7950	Each	63600.00
	V-1 Pg-211 I.NO.-17.4.1	Extra for increasing depth of manhole mentioned at Item No.17.4 above 900mm and up to 1650mm. (only excavation as per actual shall be paid separately)								
			8				8.00	4524	Each	36192.00

	V-1 Pg-228 18.2.8	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								
		Net excavtion qty.				A	**1146.60**			
		Deductions								
5		Pipe Vol.								
							0.00			
							61.81875			
							0			
							0			
							0			
		Volume of BEDDING					61.43			
		Volume Of CC					0.00			
						B	**123.24**			
		Net Qty.	cum			A-B	**1023.36**	89.00	Cum	91078.71

1060018.71
10.60

ESTIMATE OF LINING WORK OF CANAL

SL.NO.	ITEMS NO	Particulars of items	NO.	Length	(bottom width+ top width)/2	depth	quantity	unit	Rate	Amount
		L1		3195						
		L2		4500						
		L3		1200						
2	V-II, ITEMS NO .2.6	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.								
	2.6.1	All kinds of soil	1	8895	1.2	1.37	14623.38			
			2	8895	0.3425		6093.075			
							20716.455	cum	151	3128184.705
5	V- II 4.1	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering All work up to plinth level.								
	4.1.4	Cement concrete grade M-10 (Nominal Mix) with 20 mm maximum size of stone aggregate								
			1	8895	1.45	0.15	1934.66			
			2	8895	1.37	0.15	1827.92			
							3762.59	Cum	4219	15874346.12
6	5.1	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 :								
	5.1.1	Cement concrete grade M-20 (Nominal Mix) with 20 mm maximum size of stone aggregate.	1	8895	1.2	0.15	1601.10			
			2	8895	1.3	0.15	1734.53			
							3335.63	Cum	5435	18129121.88
7	**V-II, I.NO.- 5.11 , PG. NO.- 47**	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding including cost of binding wire upto floor two level including all wastage etc. complete.								
	5.11.4	Thermo-Mechanically Treated bars.								
		90 KG /CUM				90	3335.63			
							300206.25	**KG.**	58.00	17,411,962.50
										54543615.2
										545.44

Detailed Estimate Of RCC Nallah										
S.no	**Referance**	**Description of Item**	**Nos**	**L**	**B**	**D/H**	**Quantity**	**Unit**	**Rate**	**Amount**
			L1	**2530**						
1	UADD SOR Vol.I Clause No.18.2 Pg. no. 230	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	1	2530	2.9	1.95	14307.15	Cum	151	2160379.65
	V-II	**(Item No.- 2.18)**								
	2.18/pg-19	Supplying and filling in plinth under floors including, watering, ramming consolidating and dressing complete.								
	2.18.2	MOORUM/HARD COPRA								
			1	2530	2.9	0.10	733.70	Cum	478	350708.6
2	UADD SOR Vol.I Clause No.18.14 Pg. no. 232	Providing and laying in position Plain cement concrete (PCC) of specified grade excluding the cost of centering and shuttering								
	18.14.7	Cement concrete grade M-10 (Nominal Mix) with 40 mm maximum size of stone aggregate	1	2530	2.9	0.15	1100.55	Cum	4112	4525461.6
3	UADD SOR Vol.II Clause No.5.5 Pg. no. 46	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 :								
	5.1.1	Cement concrete grade M-20 (NominalMix) with 20mm maximum size of stone aggregate.								
		For Base	1	2530	2.5	0.15	948.75			
		For Wall	2	2530	0.25	1.5	1897.50			
		Top Slab	1	**100**	2.5	0.3	75.00			
						Total	**2921.25**	Cum	**5435**	15876994
		UADD Buliding SOR Vol.II Clause No.19 Pg. no. 211								
4		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	2	2530		0.15	759.00	Sq.M	160	121440
	19.1.2	Walls(anythickness)including attached pilasters, butteresses, plinth and string courses etc	4	2530		1.5	15180.00			
			1	100	2.5	-	250.00			
							15430.00	Sq.M	289	4459270

		Reinforcement								
5	**V-II,5.11**	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.								
	5.11.4	Thermo-Mechanically Treated bars. (Fe 500 D or more)	**2921.25**	90	Kg/Cum		262912.50	KG	58	15248925
		V-III, 87 PAGE								
	13.8	Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia AC/PVC/HDPE pipe, extending through the full width of the structure with slope of 1V :20H towards drawing foce. Complete as per drawing and Technical specifications and as per clause 2706 of specifications.								
				2530						
		side wall	2	1265	0.2		506	R.M	173.00	**87538**
6	V-1 Pg-228 18.2.8	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								
			2	2530	0.3	1.5	2277.00	CUM	89	202653
Total										**43033369.60**
Total cost in lacs										**430.33**

DETAILED ESTIMATE OF CHECK DAM										
SOR - V-II,III										
Sr.No.	Ref	Particulars	No	Length	Width	Ht / Depth	Quantity	Unit	Rate in Rs.	Amount in Rs.
	12.1	Earth work in excavation of foundation of structures with all lifts & lead upto 1000 meters as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom as per relevant clauses of section 300 & 2100 in.								
	I	SOIL								
1	i)	upto 3 m depth								
ii)	A	By Manual Means	1	12	11.5	0.8	110.4			
		u/s	1	12	0.76	1	9.12			
		d/s	1	12	1	1	12			
		Wing Wall	2	10	1.2	1.8	43.2			
							174.72	Cum	181.00	31624.32
2	**V-II 2.18/pg-19**	Supplying and filling in plinth under floors including, watering, ramming consolidating and dressing complete.								
	2.18.2	MOORUM/HARD COPRA								
		u/s	1	12	0.76	0.1	0.912			
		d/s	1	12	1.00	0.1	1.2			
		dam portion	1	12	11.50	0.1	13.8			
		Wing Wall	2	10	1.2	0.1	2.4			
							18.312	Cum	478.00	8753.136
	12.5	**(Item - 12.5)**								
3		Providing and laying Plain/Reinforced cement concrete in open foundation including form work shuttering etc. complete as per drawing and technical specifications and as per relevant clauses of sections 1500, 1700 & 2100 with .								
	(a)	PCC Grade M15								
		FOR PCC								
		u/s	1	12	0.76	0.15	1.368			
		d/s	1	12	1	0.15	1.8			
		dam portion	1	12	11.5	0.15	20.7			
		Wing Wall	2	10	1.2	0.15	3.6			
							27.468	Cum	4744	130308.192
	12.5	**(Item - 12.5)**								
4		Providing and laying Plain/Reinforced cement concrete in open foundation including form work shuttering etc.complete as per drawing and technical specifications and as per relevant clauses of sections1500,1700&2100 with .								
	C	PCC Grade M25								
			1	12	11.5	0.65	89.7			
		dam prtion(.76+1.66/2)	1	12	1.77	3.35	71.154			
							160.854	Cum	5271	847861.434
5		**(Page - 97,Item - 15.5) FOR V-III**								
		providing and laying pitching on slopes laid over prepared filter media including and boulder apron laid dry in frount of toe of embankment complete as per drawing and technical specification and as per relevant clause of section 2500.								
	(b)	cement concrete block of size 0.3X0.3X0.3 m cast in cement concrete M-15								
		u/s	1	12	0.76	0.8	7.296			
		d/s	1	12	1	0.8	9.6			

							16.896	CUM	4853	81996.288
6	**13.5**	**(Item - 13.5)**								
		Providing and laying Plain/Reinforced cement concrete in sub-structure as per drawing and technical specifications and as per relevant clauses of sections 1500, 1700 & 2200								
	F	RCC Grade M250								
			1	12	18.00	0.15	32.4			
		wing wall base slab	2	10	1.20	0.30	7.2			
		wall	2	9.8	0.50	2.80	27.4			
						TOTAL	**67.04**	**cum.**	5462.0	**366172.5**
		V-III, 87 PAGE								
	13.8	Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia AC/PVC/HDPE pipe, extending through the full width of the structure with slope of 1V :20H towards drawing foce. Complete as per drawing and Technical specifications and as per clause 2706 of specifications.								
				19.6						
			2	9.8	0.4		7.84	R.M	173.00	**1356.32**
	13.6	(Item - 13.6)								
7		Supplying, fitting and placing HYSD bar reinforcement in sub-structure complete as per drawing and technical specifications and as per relevant clauses of sections 1600.								
		120 KG PER CUM	100				6704	KG		
							6.704	Tonne	60087	402823.248
		TOTAL								**1870895.418**
										18.709
							NOS	4		**74.836**

Pumping Station-I							
S. NO.	**Reference**	**Item**	**No.**	**QUTY**	**Unit**	**Rate**	**Amount**
	UADD SOR	Construction of Intermediate Sewage Pumping Station with pump house including Boundary,Approach Road,Gate,Site Development & all necessary electrical and mechanical accessories					
1	Vol.I Clause No.22.8 Pg. no.301	.Job includes pumps and required associated works to completen the job in all aspect					
1	22.8.1	Cost of 1 MLD	1	1	MLD	800000	800000
	22.8.2	Add per MLD above 1 MLD	1	1	MLD	500000	500000
				2	MLD		
2	22.8.1	Cost of 1 MLD	1	1	MLD	800000	800000
							2100000
							21.00

PUMPING MAIN ESTIMATE										
		TOTAL LENGTH	**2855**	**M**		**TOTAL AMOUNT**			**137.49**	**LACS**
S.NO.	**SOR**	**PARTICULARS**	**NO**	**L**	**W**	**H/D**	**QUTY**	**RATE**	**UNIT**	**AMT (InRs.)**
		Excavation:								
1	**V-1 Pg-227 18.2**	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.								
						3.5				
	18.2.1	All Kind of soil								
			1	2855	1.3	2.45	9093.175			
							9093.18	151.00	cum	1373069.43
	18.2.2	Ordinary rock								
			1	2855.00	1.30	1.05	3897.08			
							3897.08	261.00	cum	1017136.58
		V-1 Pg-228								
2	18.5	Demolishing cement concrete manually/by mechanical means including disposal of material within 50 meters lead as per direction of Engineer-in-charge.								
	18.5.1	1:3:6 or richer mix	1	1427.50	1.30	0.30	556.73	534.0	cum	297291.15
3	**18.3.3**	Filling with moorum for pipe bedding or over the pipe including supply of moorum/sand.								
			1	2855	1.3	0.15	556.73	720.0	cum	400842.00
4	V-1 Pg-5.7 I.NO 4.1	Providing, laying, jointing & testing of socket & spigot centrifugally cast (Spun) Ductile Iron pressure pipes with inside cement mortar lining (class K-7) with suitable Rubber Gasket (Push on) joints as per IS:5382/85 including testing of joint.								
	4.1.3	150mm diameter	1	1235			1235.00	1686	RMT	2082210.00
	4.1.4	200mm diameter	1	1620			1620.00	2236	RMT	3622320.00
				2855						
5	V-1 Pg-228 18.2.8	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								
		Net excavtion qty.				A	**9093.18**			
		Deductions								
		Pipe Vol.								
							79.48125			
							0			
							0			
		Volume of BEDDING					556.73			
		Volume Of CC					835.09			
						B	**1471.29**			
		Net Qty.	cum			A-B	**7621.88**	89.00	Cum	678347.43
	UADD SOR Vol.I Clause No.18.14 Pg. no. 232	Providing and laying in position Plain cement concrete (PCC) of specified grade excluding the cost of centering and shuttering								

	18.14.7	Cement concrete grade M-10 (Nominal Mix) with 40 mm maximum size of stone aggregate								
			1.00	1427.50	1.30	0.1	185.575			
							185.575	Cum	4112	763084.4
	18.14.3	Cement concrete grade M-20 (Nominal Mix) with 20 mm maximum size of stone aggregate								
			1	1427.5	1.3	0.35	649.5125			
						Total	**649.51**	Cum	**5178**	3363176
		Ductile Iron Valves								
	14.7	Providing & fixing of following Ductile iron double flanged sluice valves as per IS:14846-2000 fitted with cap including jointing & testing with cost of jointing material such as bolts, nuts, rubber insertions etc. all complete.								
		Non Rising Spindle (CLASS PN- 1.6)								
	14.7.3	150mm dia	2				**2.00**	EACH	17071	34142.00
	14.7.6	300mm dia	2				**2.00**	EACH	58576	117152.00
						Total				**13748770.71**
									Say Rs. (In la	**137.49**

Estimate of Waste Water Sump							
S. NO.	Reference	Item	KL	No.	Unit	Rate	Amount
		UADD SOR Vol. 1 Item No. 23.1 Pg. no. 304					
		Zone-I From IPS					
	23.1	R.C.C. Ground Service Reservoirs & Sumps					
	23.1.2	Cost of 25,000 Litres Capacity	25000	1	Job	483748	483748
		Zone-II From I&D					
	23.1	R.C.C. Ground Service Reservoirs & Sumps					
	23.1.6	Cost of 75,000 Litres Capacity	75000	1	Job	103880	103880
	23.1	Upto 25,000 Litres	5000	5000	per lit	19.32	96600
							684228
Total Cost Collection Sump			**205**	KL			**6.84**

Abstract of Cost Of Stp			
S.No.	**Discription of item**	MLD	**Amount lacs**
1	**ZONE 1+5 (Gonglai)**	**4**	**616.00**
2	**ZONE 3 (AHP SITE)**	**2**	**330.00**
3	**ZONE 4 (Budhi Talab)**	**1**	**240.00**
5	**ZONE 5 (Moti Talab)**	**1**	**256.65**
			1442.65

	ZONE-1 &5 STP	4	MLD		
S. No	Description	Unit	Quantity	Rate	Amount
	Sequantial Batch Reactor Technology (SBR Technology)				
1	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, Distribution Chamber and Biological SBR Basins, 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, to get recyclable quality of water for industrial / agricultural purposes.				
	UADD SOR Vol. 1 Item No.22.7 Pg. no. 298-301				
	UNITS INCLUDED:				
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 phosper 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	**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	**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 forwater 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	**SBR Basins:** Desiging, providing and constructing in RCC mixed (M-30), SBR basins for biological removal of BOD along with nitrification, denitrification, Bio- P removal in compartments to handle combine flow of 1 DWF, incoming flow and recirculation flow incluing construction of selector comaprtments and providing 1.2 m wide clear approach walkways, expansion joints wherever necessary, incluiding foundations etc as per specifications. Peak factor shall be 2, F/M ration shall be : 0.15, complete with air blowers, fine diffused aeration grid/ equipment and FB 0.6 m depth, SWD as required. DO level in SBR basin to be minimum 2 mg/l complete with "Oxygen Uptake Rate " control system and all related instruments, Stainless steel decanters and automation works. MLSS concentrations shall be 2000 - 5500 mg/l or more,MLVSS to MLSS ratio to be 0.8. HRT shall be between 12 to 16 hrs and SRT suitable for fully disgested sludge.It should have all other related works as per detailed specification.				
1.5	Chlorine Contact Tank: Designing providing and constructing chlorine contact chamber of adequate capacity to deal with 1DWF 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.				
1.6	**Chlorinator and Chlorinator Room/Tonner Room:** Designing, providing and constructing chlorinators vacuum type 2 Nos, with auto switchover facility and having cpacity 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 equipments, safety devices , lifting equipments, 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.				

4.1	**Chlorinator and Chlorinator Room/Tonner Room:** Designing, providing and constructing chlorinators vacuum type 2 Nos, with auto switchover facility and having cpacity 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 equipments, safety devices , lifting equipments, 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.				
4.2	**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.				
5.1	**Sludge Centrifuge Platform with Centrifuges:** Designing, providing, constructing and installing including foundation etc, sludge centrifuge to handle the sludge flow of 1 day in 20 hours 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.				
5.2	**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.				
6.1	**Piping work in CI Class-LA 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				

6.2	**Administrative Bulding cum Laboratory (G+1):** Designing, providing and constructing administrative building, office cum Laboratory including stores. This shall be a building having appropriate carpet area and ground floor and at first floor complete as per specifications including necessary excavation, foundation in RCC M-20 framed structure brick masonary (11- class in C.M. 1:6) 20 mm cement plaster in C.M 1:3 inside and outside painiting. Aluminium door and window with glass pannels, mosaic tile flooring and skirting and all other allied items, fixtures fastening electrification arrangement water supply arrangement etc complete. The building will have laboratory on upper floor of administrative building and should be so centralized that it should not be attached with any unit but should have complete control of every unit as per laboratory euipment, beautification, telephone and intercom arrangement and wireless system.Staff Quarters as per CPHEEO Manual for Operation and maintenance purpose.				
	Cost of plant with capacity (Min. No of basins)				
22.7.1	Cost of 1 MLD (Min. No. of basins -2)	MLD	1	326	326
22.7.2	Add per MLD above 1 MLD upto 2 MLD (Min. No. of basins - 2)	MLD	1	110	110
22.7.3	Add per MLD above 2 MLD upto 5 MLD (Min. No. of basins - 2)	MLD	2	90	180
Total Capacity of STP		MLD	**4**		
TOTAL AMOUNT					**616**

		2	MLD		
S. No	Description	Unit	Quantity	Rate	Amount
	Rotating Media Bio Reactor				
1	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. OR Designing, providing / constructing Vortex Grit Separators in Mild Steel with Coal Tar epoxy on inside and Marine Epoxy on outside, complete with internal piping, sludge removal valve etc complete				
	UADD SOR Vol. 1 Item No.22.7 Pg. no. 298- 301				
	HYBRID ANAEROBIC REACTOR: in MS/				
1.1	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, den 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				
1.2	ANOXIC REACTOR with attached growth media of PVC fills for Nitrogen removal. Tank of MS/ RCC M30				
	Chlorine Contact Tank: Designing providing and constructing chlorine contact chamber of adequate capacity to deal with 1DWF average flow. The chlorine contact tank should be of 30 min capacity, during average flow to achieve				

1.3	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				
1.4	Chlorinator and Chlorinator Room/Tonner Room: Designing, providing and constructing chlorinators vacuum type 2 Nos, with auto switchover facility and having capacity for dosage ofadequate 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				
1.2	Separator				
	ANOXIC REACTOR with attached growth media of PVC fills for Nitrogen removal. Tank of MS/ RCC M30				
1.3	Chlorine Contact Tank: Designing providing and constructing chlorine contact chamber of adequate capacity to deal with 1DWF 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				

1.4	Chlorinator and Chlorinator Room/Tonner Room: Designing, providing and constructing chlorinators vacuum type 2 Nos, with auto switchover facility and having capacity for dosage ofadequate 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)				
1.5	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.				
1.6	Sludge Centrifuge Platform with Centrifuges: Designing, providing, constructing and installing including foundation etc, sludge centrifuge to handle the sludge flow of 1 day in 20 hours 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. OR: Basket Centrifuge/s of adequate capacity with PP bags;				
	complete with mass foundation.				
4.1	Outfall Sewer: Designing, providing and constructing appropriate outfall sewer of RCC NP2 pipe, to discharge treated effluent, untreated effluent from outlet chamber 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.				
4.2	Piping work in CI Class-LA OR Ductile Iron 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 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.				
5.1	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	For 1 MLD	MLD	1	240	240
22.15.2	Add per MLD above 1 MLD upto 2 MLD	MLD	1	90	90
22.15.3	Add per MLD above 2 MLD upto 5 MLD	MLD	0	80	0
			2		
	TOTAL AMOUNT				**330**

ESTIMATE FOR ZONE-4

	BODIA TALAB	1	MLD		
S. No	Description	Unit	Quantity	Rate	Amount
	Rotating Media Bio Reactor				
1	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. OR Designing, providing / constructing Vortex Grit Separators in Mild Steel with Coal Tar epoxy on inside and Marine Epoxy on outside, complete with internal piping, sludge removal valve etc complete				
	UADD SOR Vol. 1 Item No.22.7 Pg. no. 298- 301				
1.1	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, den 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				
1.2	Separator ANOXIC REACTOR with attached growth media of PVC fills for Nitrogen removal. Tank of MS/ RCC M30				
	Chlorine Contact Tank: Designing providing and constructing chlorine contact chamber of adequate capacity to deal with 1DWF average flow. The chlorine contact tank should be of 30 min capacity, during average flow to achieve				

1.3	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				
1.4	Chlorinator and Chlorinator Room/Tonner Room: Designing, providing and constructing chlorinators vacuum type 2 Nos, with auto switchover facility and having capacity for dosage ofadequate 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				
1.2	Separator				
	ANOXIC REACTOR with attached growth media of PVC fills for Nitrogen removal. Tank of MS/ RCC M30				
1.3	Chlorine Contact Tank: Designing providing and constructing chlorine contact chamber of adequate capacity to deal with 1DWF 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				

1.4	Chlorinator and Chlorinator Room/Tonner Room: Designing, providing and constructing chlorinators vacuum type 2 Nos, with auto switchover facility and having capacity for dosage ofadequate 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)				
1.5	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.				
1.6	Sludge Centrifuge Platform with Centrifuges: Designing, providing, constructing and installing including foundation etc, sludge centrifuge to handle the sludge flow of 1 day in 20 hours 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. OR: Basket Centrifuge/s of adequate capacity with PP bags;				
	complete with mass foundation.				
4.1	Outfall Sewer: Designing, providing and constructing appropriate outfall sewer of RCC NP2 pipe, to discharge treated effluent, untreated effluent from outlet chamber 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.				
4.2	Piping work in CI Class-LA OR Ductile Iron 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.				
5.1	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	For 1 MLD	MLD	1	240	240
22.15.2	Add per MLD above 1 MLD upto 2 MLD	MLD	0	90	0
22.15.3	Add per MLD above 2 MLD upto 5 MLD	MLD	0	80	0
			1		
	TOTAL AMOUNT				**240**

ESTIMATE OF STP						
		MOTI TALAB	**1.00**	**MLD**		
S.no	SOR	Description	Unit	Quantity	Rate	Amount
1.00	22.12	Design, providing, construction, installation, commissioning, and operation of Nature Based composite ECO-Constructed Wetland (ECO-CW) / Phytoremediation based STP, including 12 months of Defect Liability Period (DLP). During DLP all repair works, replacement of dead plants will be carried out at no cost. The STP will be for treatment of typical domestic sewage having pH in the range of is 5.5 to 9.0, BOD max 200 mg/L, TSS max 500 mg/L, COD max 450 mg/L, total N-15-20 mg/L and P-10 mg/L as feed without any contamination of industrial waste. If raw sewage characteristics observed as per test (conducted before designing STP) are more critical than the above-mentioned characteristic, then same shall be used for designing of Sewage Treatment Plant (STP) Quality of treated water will meet the parameters as specified under table 'A' below when treatment plant scope is limited to primary and secondary treatment steps described herein. In addition to the above, advance level treatment to be added for meeting treated water quality specified in table 'B' below. Drawings: Site specific detailed drawing with plan, sections, hydraulic drawing, P&I diagram. **Primary Treatment:** Should include properly designed following components ☐ Screen Chambers with RT 3 min or velocity 0.6 m/s with manual Bar Screen (Coarse Screen made in SS304 with opening of 15-20 mm) ☐ Intake Well with minimum RT of 3 times peak flow of				
		Advance level Treatment Scope: Dual Media filter (for STP capacity below 1 MLD) Pressure Sand Filter (for STP capacity above 1 MLD) & Activated Carbon Filter (for STP capacity above 1 MLD) Filter feed pump (1 W+1S) Required Cabling and Piping for Advance level treatment				
		Upto Secondary Treatment				
	22.12.37	Cost of 1000 KLD plant	Each	1.00	24483800.00	24483800.00
		Additional Level Treatment				
	22.12.125	Cost of 1000 KLD plant	Each	1.00	1181431.00	1181431.00
		Total Capacity of STP				
						25665231.00
		Total Cost				256.65

ESTIMATE OF EARTH WORK

Sr.No.	Ref	Particulars	No	Length	Width	Ht / Depth	Quantity	Unit	Rate in Rs.	Amount in Rs.
		FILLING								
	V-III Pg-22 3.11	Construction of embankment with approved material having CBR>7 obtained from borrow pits with all lifts and leads, transporting to site, spreading, grading to required slope and compacting by vibratory rollers to meet requirement of table 300-1, 300-2 and as per relevent clauses of section-300.								
		ZONE 3	1	20	30	1.50	900			
		ZONE 3	1	60	35	1.50	3150			
		CUM					**4050.00**	cum	155.00	627750.00
										6.2775

SOR 2023-24

Old Sch. C-1.1

COST SCHEDULE - C-1.1

1 KM OF 11 KV LINE ON 11 m H-Beam Using Raccoon Conductor maximum Span 70 Mtrs IN RURAL AREA

Sl. No.	Item Code	Particulars	Unit	FoR Works Rate	HSN or SAC Code	Qty.	Total Amt. (Rs.) using F.O.R. rates Rate	Erection rates	Total Amt. of Erection
1	2	3	4	5	6		8	9	10
1	M-0501067	H-Beams 152 X 152 mm., 37.1 Kg./Mtr.-11 mtr. Long = 408.1 kg	No.	26285	7216	70	1839950	2149	150430
2	M-0502010	11 KV 'V' cross-arms angle type (65x65x6 mm angle)	No.	949	7216	70	66430	135	9450
3	M-0502019	Back Clamp suitable for H-Beam (MS Flat 65x8 mm)-each weight 1.92 Kg	No.	148	7216	140	20720	0	0
4	M-0502060	11 KV Top clamps angle type 65x65x6 mm	No.	231	7216	70	16170	49	3430
5	M-0502367	11 KV Single pole cut point fitting 100x50x6 mm channel	Set	2653	7216	0	0	509	0
6	M-0502185	11 KV Side cross arm 75x40x6 mm Channel	No.	2720	7216	0	0	175	0
7	M-0403096	Earthing Coil (coil of 115 turns of 50 mm.dia. and 2.5 Mtrs. lead of 4.0 mm. G.I wire)	No.	120	7217	70	8400	0	0
8	M-0602002	11 KV Pin insulator Polymer Composite (5KN) FRP dia 24mm	No.	145	8546	210	30450	34	7140
9	M-0401012	AAAC Conductor Raccoon with 3 % Sag	Km.	53712	7614	15.5	832536	9900	153450
10	M-0404232	Jointing Sleeves suitable for 80 Sq. mm.Al. Eq. AAAC conductor	No.	91	7308	30	2730	0	0
11	M-0502231	Painted Stay set 20 mm. complete with turn buckles	Nos.	872	7217	25	21800	677	16925
12	M-0403014	Stay wire 7/4mm. kg per stay for H-Beam / PCC Pole 280 Kg, 9 m @ 7.5, 11 m @ 8.50, 13 m @ 10, 15 m @ 12	kg	68	7217	212.5	14450	0	0
13	M-0502261	Clamp suitable for H-Beam (each weight 3.2 kg ms flat 65x8mm)	Set	246	7216	25	6150	0	0
14	P-0702056	Stone Block/Pre cast block for base pedding 450x450x75mm	No.	271	99541	70	18970	0	0
15	P-0001037	Concreting (1:3:6) **0.36 Cmt** for [H-Beam - 7 m, 9 m & RSJ 9.3 m, PCC Pole DP / TP/4P/6P of 140 kg. 8 m 200 Kg. 9 m 280 Kg. 9 m], **0.56 Cmt** for 11 m, **0.60 Cmt** for 13 m, **0.67 Cmt** for 15 m Per Pole including muffing with Pole Pit digging by Hydra M/c.	Cmt. (1:3:6)	4360	99541	39.2	170912	630	24696
16	P-0001002	Concreting of stay @ 0.3 cmt. per stay	Cmt. (1:3:6)	4360	99541	7.5	32700	630	4725
17	M-1214001	Red oxide paint	Ltr.	90	3208	100	9000	270	27000
18	M-1214002	Aluminium paint	Ltr.	191	3208	100	19100	192	19200
19	M-0403016	Anti climbing devices	No.	295	7313	70	20650	40	2800
20	M-0502429	Danger Boards Enamalled Type 11KV	No.	67	8310	70	4690	29	2030
21	M-0404370	Binding wire and tape	Kg.	346	7605	15	5190	0	0
22	M-0403208	M.S.Nuts and Bolts	Kg.	79	7318	100	7900	0	0
		Total					**3,148,898**		**421,276**
		Dismanteling & return Area store							**0**
23		**Total Cost using F.O.R Rate + Erection cost**					**3570174**		
							35.70		

Note:–The erection rates mentioned **"0"** against various items are included in its related main material erection charges. For details refer the guide line of SOR .

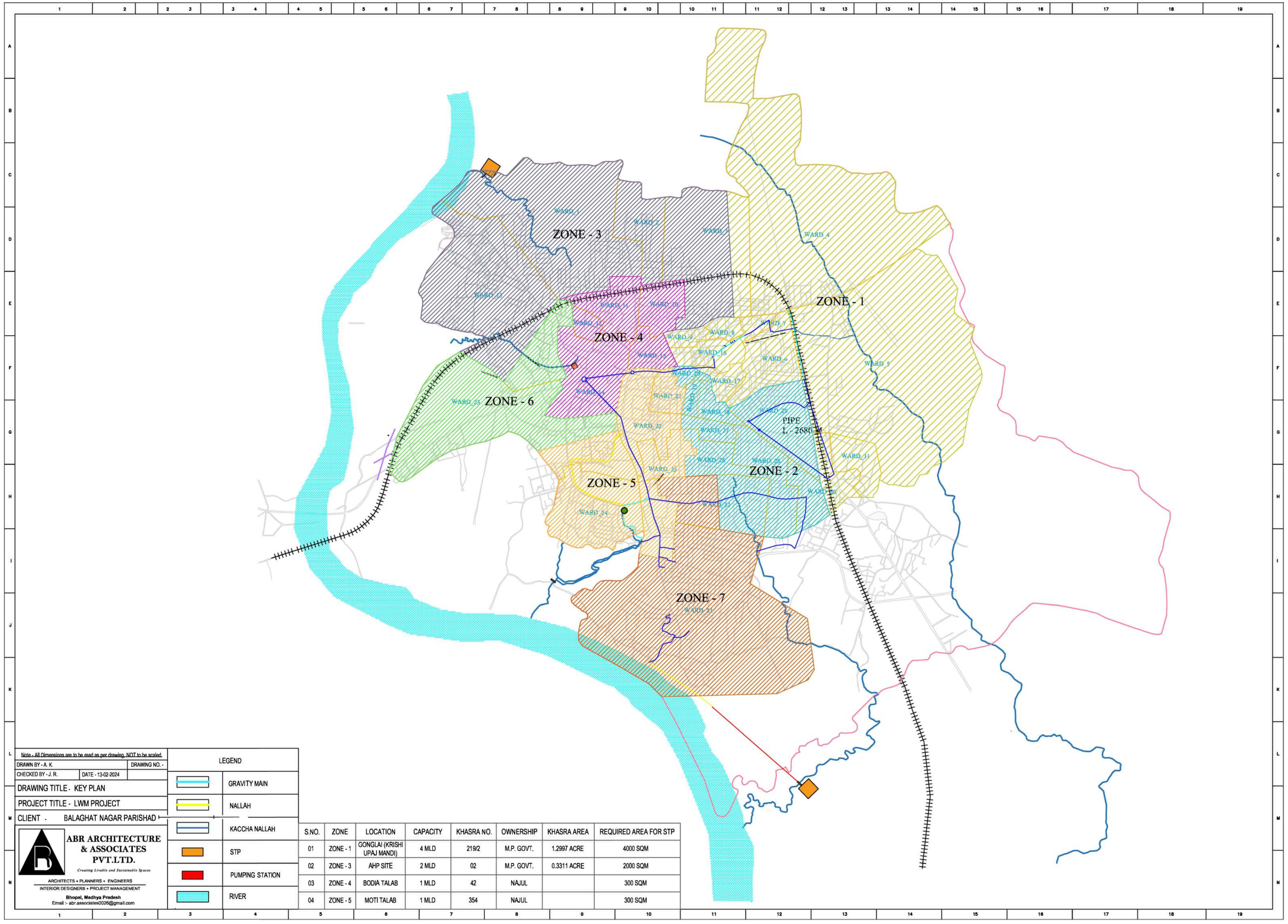
S.No	Item Code	Item Name	Particulars	Unit	Qty.	UADD Rate	Total Amount
1	UADD-15.1 page no. 87	Transformer	Supplying, installing,testing and commissioning of 11/0.4K.V. 3Phase 50 Cycle oil immersed, naturally cooled, out door type transformer connected delta on H.T. side and star on L.T. side hand operated off load, Tap changer switch, above 100kVA rating and diagram plate, two earthing terminal, lifting lugs,oil level guage,drain valve with plug, temperature not exceeding 50ºC on load,oil conservator with drain plug,oil filling hole with plug dehydrating silica gel breather, four unidirectional roller, arcing horns, explosion vent, terminal arrangement bushing on H.V. side and cable box on LVside, first filling ofoil upto desired level and transformer installing on existing structure with all Required materials arrangements as required as per IS specification.				
		3	100 Kva	EACH	4	104415.00	417660.00
2	UADD Item No. 13.2.6 page 68	3	Supply of support for overhead line RS joist / H-beamof I.S. standard including welding,drilling of required hole etc. complete as required.H-Beam 152x152mm , Std weight 37.1 kg per meter, each pole hight 11mtr.	Meter	176	1810	318560.00
3	UADD 13.71 page no. 71		Supplying of two lengths of channel iron 75mmx 40mmx 7.14 kg/mtr .Double pole cross arm for three wire 11kV overhead line conductors complete with through bolt sand nuts for clamping to the poles, 50mmx6mm m.s flats welded on one side to the channel iron and with bolts and nuts on the other side for tying the cross arms together, including drilling holes for insulator pins/fittings, bolt sand nuts etc. and painting with primer and finish paint as required.	Set	4	2558	10232.00
4	M-0502261		Clamp suitable for 152 X 152 mm., 37.1 Kg./mtr H-Beam (each weight 3.2 kg)	SET	40	256	10245.12
5	UADD 13.80 page no. 77	7.14	Supplying and erection of 11kV disc insulator for 11kV overhead lines with galvanised insulator fittings, ball and socket type, and complete with galvanised strain clamp, bolts, nuts washer etc. as required.	NO	12	780	9360.00
6	M-0404211		33 KV Strain hardware (T&C type) fittings	NO	12	234	2808.00
7	UADD 15.4.1 Page no. 87		Supplying, installing ,testing of 11KV D.O. fuse assembly with brass part contact for11/0.4KV DP Structure set of 3 with fuse with barrel with required fuse element & other materials as per specification on existing D.P.structureas required.(set of 3nos.)	Set	4	4405.00	17620.00
8	M-0502019		Back Clamp suitable for H-Beam (MS Flat 65x8 mm)- each weight 1.92 Kg	No.	16	154	2464.00
9	UADD 15.10.iii page no. 88		Supplying, installing, testing and commissioning of 11KV C.Ts. (Outdoor oil filled type) : with accuracy class 0.5 500-250/5 Amps	Number	4	9645	38580.00
10	UADD 15.8.i Page no. 88		Stay Wire 7/3.15 mm.(7/10 SWG) kg per stay for PCC Pole 140 kg 8 m @ 5.5, 200 Kg. 9 m @ 6.5, RSJ 9.3 m.@ 6.5	Kilogram	120	64	7680.00
11	P-0702056		Stone Block/Pre cast block for base pedding 450x450x75mm (2 NO PER STAY AND 1 NO FOR POLE),	No.	8	289	2312.00
12	P-0001037		Concreting (1:3:6) **0.36 Cmt** for [H-Beam - 7 m, 9 m & RSJ 9.3 m, PCC Pole DP / TP/4P/6P of 140 kg. 8 m 200 Kg. 9 m 280 Kg. 9 m], **0.56 Cmt** for 11 m, **0.60 Cmt** for 13 m, **0.67 Cmt** for 15 m Per Pole including muffing with Pole Pit digging by Hydra M/c.	CMT	6.4	4599	29433.60
13	UADD-13.6.8 PAGE No 69		Supplying and drawing of stranded Aluminium Conductor Steel Reinforced (ACSR) confirming to IS:398-1976of approvedmake, stringing, making off completewith binding at existing insulator, jointing, jumpering, tearing off, connecting etc. as required and clearing of obstacles (if any) etc.ACSR 6/1 - 4.09mm dia (Raccoon) with equivalent copper area 48 Sqmm (0.075 sq inch) equivalent calculated Aluminium area 77.83 Sq.mm.	Km.	0.2	79028	15805.60
14	MPEB-M-1214001		RED-OXIDE PAINT	Ltr	20	96	1920.00
15	MPEB-M-1214002		ALUMINUM PAINT	Ltr	20	203	4060.00

16	UADD 13.66 page no. 75		Supplyingof channel iron 75mmx40mmx7.14Kg/Mtr.cross arm for two 11kV overhead line conductor scomplete with 50mmx50mm x6mm angle iron bracket welded to the channel iron and complete with 50mmx6mmM.S. flat iron clamps, bolts and nuts including drilling holes for insulator pins,bolts and nuts etc.and painting with primer and finish as required.	Each	4	1253	5012.00
17	UADD 15.3.1		Supplying installing and testing of AB isolating switch assembly set gang operated suitable for 11/0.4 KV, DP structure with brass part contacts, operating rodwith requiredGI pipe, handle lockingarrangement onOn-Off position conforming to IScompletewith requiredmaterial and installing on existing structure to complete the job as required as per specification.	Set	4	6352	25408.00
18	M-0502131		Transformer mounting Channel (100X50x6 mm.)	Set	4	4212	16848.00
19	M-0502137		Trans. Belting with 50 X 50 X 6 mm.angle with two cross fixing channels	Set	4	2481	9924.00
20	UADD-15.8.i page no. 88		Supplying, installing, or stay wires	Kg	200	64	12800.00
21	UADD- 15.7.i page no 88		(i)Supplying, installing, testing and commissioning of LT Distribution Box with TPN isolator of 600amper on incoming,bus bar and 6S.P.M.C.C.B.of 120A" .on outgoing side for 200 KVA transformer	Number	4	26523	106092.00
22	MPEB-M-0302028		Three phase Static Energy meters 20-80 Amps.with L.S. & TOD Facility with box	Number	4	2740	10960.00
23	UADD 15.8.ii		M.S.Nuts with Bolts	Kilogram	260	50	13000.00
	MPEB-'P-0001041		Yard fencing with chain link mesh over RCC beam 2.4 mtr. Height	RM	60	3907	234420.00
	MPEB-P-0001061		PROVIDING & FIXING PERFORATED CABLE TRAY 300 MM WIDE & 2 MM THICK FIXED ON 45X45X5 MM M.S. ANGLE STAND GROUTED IN C.C 1:24	RM	48	1853	88944.00
	UADD- 19.9.2 Page no. 97	40W / 48W	Supplyingofstreet light with high power LED of 1 to 3 W each assembled on single MCPCB, system lumens output with efficacy>110 lm/W. luminiare having color temp 6500K & 50000 burning hrs life with minimum@L70, The colour rendering index ofLED light should be more than 70. Luminiare comprises of driver, PF0.95 & surge protection 4KV. Housing made of pressure die cast aluminium with heat resistant flatg lass/Lens type, IP66 protection.Submission LM80-08 Form LED Source Manufacturer & LM 79 08 / IS16106 from NABL approved lab. Manufacturer manadatory i/c 50mm.diaG.I. Pipe bracket upto 2mtr. long in required angle/shape, connectionlead, testingetctocompletethejob.2YrsGuaranteecertificate from manufacturer.	No.	8	3657	29256.00
	UADD-11.40.2 PAGE NO. 65		Supplying and erecting earth pit of minmum bore dia 150 mm size, approved make safe earthing electrode consiting pipe in pipe tecnologie as per IS3043-1987 made of corriosion free GI pipes having outer pipe dia of 50mm having 80-200 micron galvanising, inner pipe dia of 25 mm having 20-250 micron galavinsing, connection teriminal dia of 12mm with constent OHMIC value sourrounded by highly conductiv compund with high charge disipation sutible for effective and maintence free earthing. with 3 mtr. Pipe innormal soil with50kg (twobag) back filling compound	Each	4	9720	38880.00
			Total				**1480284.32**
			Amount in lacs				**14.80**

On Grid Solar Photo voltaic Power Plant						
S.No.	Reference	Description of Item	Unit	Rate (in Lakhs)	Quantity	Amount (in Lakhs)
1	MPPWD ELECTRICAL SOR 2024 / CHAPTER-55, page 235	Supply, Installation, Testing and Commissioning of on grid Solar Photo voltaic Power Plant conforming to MNRE specifications as amended, consisting of Mono/Poly Crystalline silicon solar cells, net metering facility, necessary protections, earthing, mountedon Aluminium/GI structure of suitable strength with following components complete as required:- a) Solar Photo voltaic Module of capacity 330Wp or above, manufactured in India, conforming to IS14286/IEC61215 ,IS/IEC61730-Part-1, IS/IEC61730-Part-2. Solar Photovoltaic Module conversion efficiency shall not be less than 16.5%. PV modules used in solar power plants/systems must be warranted for their out put peak watt capacity, which should not be less than 90%at the end of 10 years and 80%at the end of 25 years. b) Power Conditioning Unit (PCU)of 350-800V DC Input voltage range and 400 VAC, three phase, 4wire, 50Hz+/- 2.5Hz, output voltage suitable to generate AC Power with efficiency not less than 97%, total harmonic distortion less than 3% and suitable for ambient temperature from 0 to 50 degree C. The PCU shall adjust the voltage and frequency level to suit the Grid Voltage Frequency. c) Data Monitoring System complete with accessories. d)Fixing of Array junction box & Main junction box with IP65 protection and termination arrangement for incoming and outgoing cable along with glands, lugs and other accessories etc. as required. e) Lightning and surge voltage protection. f)Connections & Interconnections by supplying & fixing required size XLPE insulated copper conductor 1.1kV grade armoured				
		ZONE- 1+5 (Gonglai)	KWp	74750	25	1868750
		ZONE- 4 (Bodi talab)	KWp	74750	12	897000
		ZONE- 3 (ahp site)	KWp	74750	15	1121250
		Total Cost				3887000
		Total Cost in lacs				38.87

Estimate for Reuse of treated Wastewater: Sumpwell and other items						
S.No.	**Reference**	**Description**	**Unit**	**L/No**	**Rate (RS)**	**Amount**
		ZONE-1&5				
1	UADD SOR Vol. 1 Item No. 23.1 Pg.no. 304	R.C.C. Ground Service Reservoirs & Sumps				
	23.1.10	Cost of 1,50,000 Litres Capacity	Job	1	1612485	1612485
2	UADD SOR Vol. 1 Item No. 4.1 Pg.no. 56	Providing, laying, jointing & testing of socket & spigot centrifugally cast (Spun) Ductile Iron pressure pipes with inside cement mortar lining (class K-7) with suitable Rubber Gasket (Push on) joints as per IS:5382/85 including testing of joint.				
	4.1.3	150 mm Diameter	Meter	10	1686	16860
3	*UADD SOR Vol. 1 Item No. 16.1 Pg.198*	Supply, delivery at site with necessary packing, receiving, unloading, shifting, storing, installation, testing and commissioning of Horizontal Centrifugal Split Casing pumps with motor, CI casing and casing ring, SS 316 impeller, SS 410 Shaft and shaft sleeve, coupling guard, common base plate, foundation bolts etc. complete with all respect as per the specification.				
	16.1.1	Discharge 20 to 30 LPS and head 20 to 30 M	Each	2	132135	264270
						1893615
Total Cost of 150 KL Sump Well with pump & Pipe						**18.94**

Estimate for Reuse of treated Wastewater: Sumpwell and other items						
S.No.	**Reference**	**Description**	**Unit**	**L/No**	**Rate (RS)**	**Amount**
		ZONE-2				
1	UADD SOR Vol. 1 Item No. 23.1 Pg.no. 304	R.C.C. Ground Service Reservoirs & Sumps				
	23.1.8	Cost of 1,00,000 Litres Capacity	Job	1	1210287	1210287
2	UADD SOR Vol. 1 Item No. 4.1 Pg.no. 56	Providing, laying, jointing & testing of socket & spigot centrifugally cast (Spun) Ductile Iron pressure pipes with inside cement mortar lining (class K-7) with suitable Rubber Gasket (Push on) joints as per IS:5382/85 including testing of joint.				
	4.1.3	150 mm Diameter	Meter	10	1686	16860
3	*UADD SOR Vol. 1 Item No. 16.1 Pg.198*	Supply, delivery at site with necessary packing, receiving, unloading, shifting, storing, installation, testing and commissioning of Horizontal Centrifugal Split Casing pumps with motor, CI casing and casing ring, SS 316 impeller, SS 410 Shaft and shaft sleeve, coupling guard, common base plate, foundation bolts etc. complete with all respect as per the specification.				
	16.1.1	Discharge 20 to 30 LPS and head 20 to 30 M	Each	2	132135	264270
						1491417
Total Cost of 100 KL Sump Well with pump & Pipe						**14.91**



Note - All Dimensions are to be read as per drawing, NOT to be scaled.

DRAWN BY - A. K.	DRAWING NO. -
CHECKED BY - J. R.	DATE - 13-02-2024

DRAWING TITLE - KEY PLAN

PROJECT TITLE - LWM PROJECT

CLIENT - BALAGHAT NAGAR PARISHAD

ABR ARCHITECTURE & ASSOCIATES PVT.LTD.
Creating Livable and Sustainable Spaces
ARCHITECTS + PLANNERS + ENGINEERS
INTERIOR DESIGNERS + PROJECT MANAGEMENT
Bhopal, Madhya Pradesh
Email :- abr.associates0026@gmail.com

LEGEND

- GRAVITY MAIN
- NALLAH
- KACCHA NALLAH
- STP
- PUMPING STATION
- RIVER

S.NO.	ZONE	LOCATION	CAPACITY	KHASRA NO.	OWNERSHIP	KHASRA AREA	REQUIRED AREA FOR STP
01	ZONE - 1	GONGLAI (KRISHI UPAJ MANDI)	4 MLD	219/2	M.P. GOVT.	1.2997 ACRE	4000 SQM
02	ZONE - 3	AHP SITE	2 MLD	02	M.P. GOVT.	0.3311 ACRE	2000 SQM
03	ZONE - 4	BODIA TALAB	1 MLD	42	NAJUL		300 SQM
04	ZONE - 5	MOTI TALAB	1 MLD	354	NAJUL		300 SQM

STP - ZONE-3
I & D (Length:7.0 m)
Lat:- 21°49'53.47"N
Long:- 80°10'20.70"E
STP Capacity:2.00 MLD

CANAL LINING
L - 1200 M

ZONE - 3

NALLAH
L - 2530 M

DR - 5
L - 1330 M

DR - 4
L - 165 M

ZONE - 1

Z-4,BODIA TALAB STP
Lat:- 21°49'0.79"N
Long:- 80°10'47.21"E
STP CAPACITY:1.00 MLD

DR- 6
L - 560 M

DR - 2
L - 340 M

DR- 3
L - 800 M

ZONE - 6

PIPE
L - 2680

CANAL LINING
L - 4500 M

Drain - 1
L - 528 M

NP3 PIPE - 2
L - 315 M

ZONE - 2

Z-5,MOTI TALAB STP
Lat:- 21°48'21.31"N
Long:- 80°11'3.02"E
STP CAPACITY:1.00 MLD

ZONE - 7

CANAL LINING
L - 3195 M

PS-II

PM - 2
L - 1230 M

PS-I

PM - 1
L - 1620 M

STP- ZONE-1
I & D(Length:6.5 m)
Lat:- 21°47'5.66"N
Long:- 80°11'54.53"E
STP Capacity:4.00 MLD

LEGEND

DRAIN			
NP-3			
CANAL LINNING		NALLAH	
STP		EXISTING ULB DRAIN	
PUMPING STATION		PUMPING MAIN	
RIVER		I & D STRUCTURE	

Note - All Dimensions are to be read as per drawing, NOT to be scaled.

DRAWN BY - A. K. | DRAWING NO. -

CHECKED BY - J. R. | DATE - 13-02-2024

DRAWING TITLE - KEY PLAN

PROJECT TITLE - LWM PROJECT

CLIENT - MALAJKHAND NAGAR PARISHAD

ABR ARCHITECTURE & ASSOCIATES PVT.LTD.
Creating Livable and Sustainable Spaces
ARCHITECTS + PLANNERS + ENGINEERS
INTERIOR DESIGNERS + PROJECT MANAGEMENT
Bhopal, Madhya Pradesh
Email :- abr.associates0026@gmail.com

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STP - ZONE-3
I & D (Length:7.0 m)
Lat:- 21°49'53.47"N
Long:- 80°10'20.70"E
STP Capacity:2.00 MLD

CANAL LINING
L - 1200 M

ZONE - 3

NALLAH
L - 2530 M

DR - 5
L - 1330 M

DR - 4
L - 165 M

ZONE - 1

Z-4,BODIA TALAB STP
Lat:- 21°49'0.79"N
Long:- 80°10'47.21"E
STP CAPACITY:1.00 MLD

Sheetal Palace

DR- 6
L - 560 M

DR - 2
L - 340 M

DR- 3
L - 800 M

ZONE - 6

PIPE
L - 2680 M

Hotel Mallikarjun International

v Phule Chowk)

D1 - 1
L - 528.00 M

NP3 PIPE - 2
L - 315 M

ZONE - 2

CANAL LINING
L - 4500 M

Nagpure T

Z-5,MOTI TALAB STP
Lat:- 21°48'21.31"N
Long:- 80°11'3.02"E
STP CAPACITY:1.00 MLD

ZONE - 7

Subharambh Marriage Lawn

Yashika General Store

CANAL LINING
L - 3195 M

esi Vine Shop,Akodi

PS-II

PM - 2
L - 1230 M

PS-I

PM - 1
L - 1620 M

STP- ZONE-1
I & D(Length:6.5 m)
Lat:- 21°47'5.66"N
Long:- 80°11'54.53"E
STP Capacity:4.00 MLD

LEGEND

	DRAIN		CANAL LINNING
	NP-3		NALLAH
	KACCHA NALLAH		EXISTING ULB DRAIN
	STP		PUMPING MAIN
	PUMPING STATION		I & D STRUCTURE
	RIVER		

Note - All Dimensions are to be read as per drawing, NOT to be scaled.

DRAWN BY - A. K. | DRAWING NO. -

CHECKED BY - J. R. | DATE - 13-02-2024

DRAWING TITLE - KEY PLAN

PROJECT TITLE - LWM PROJECT

CLIENT - MALAJKHAND NAGAR PARISHAD

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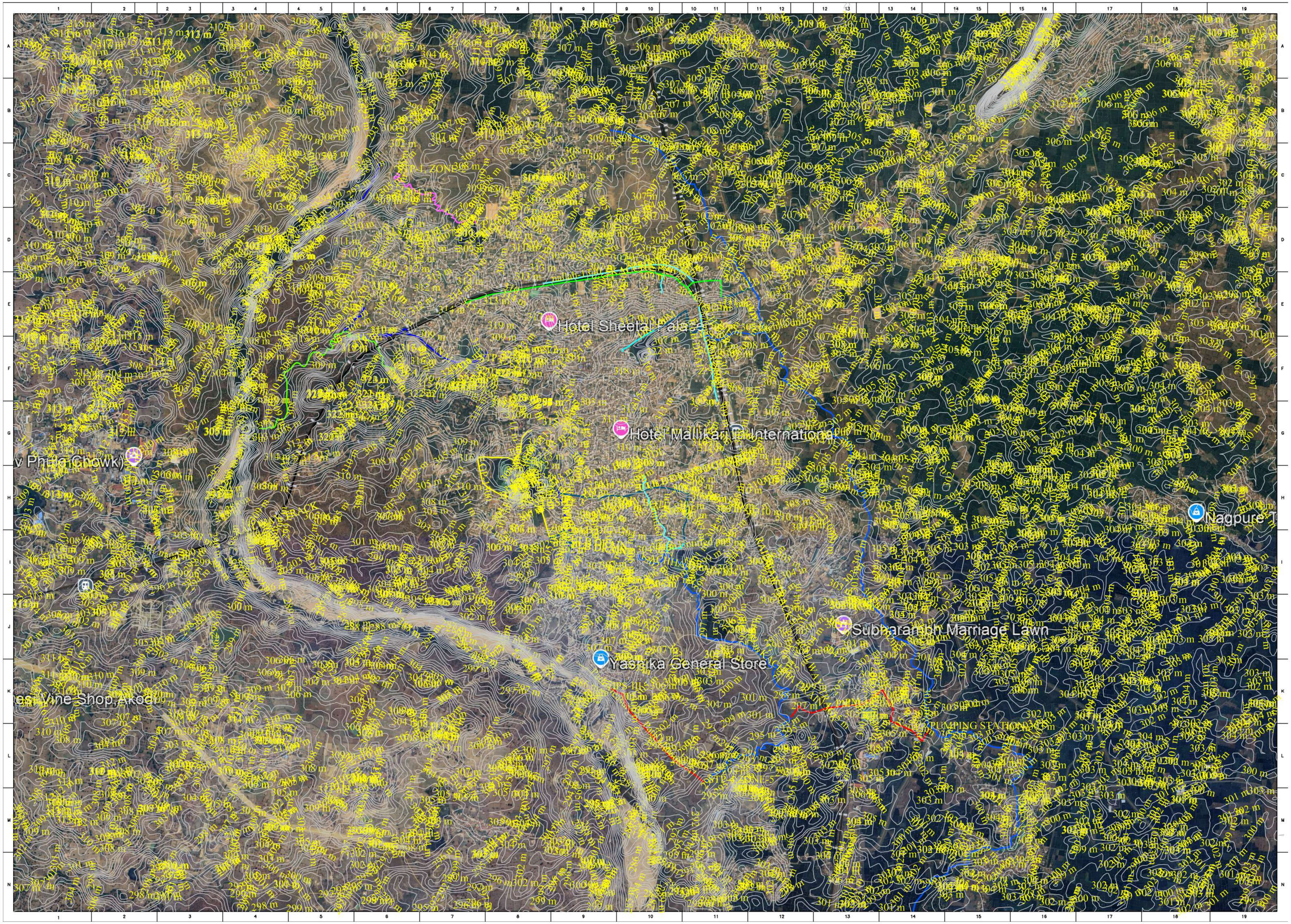

Hotel Sheetal Palace
Subharambh Marriage Lawn
Yashika General Store
PUMPING STATION

821

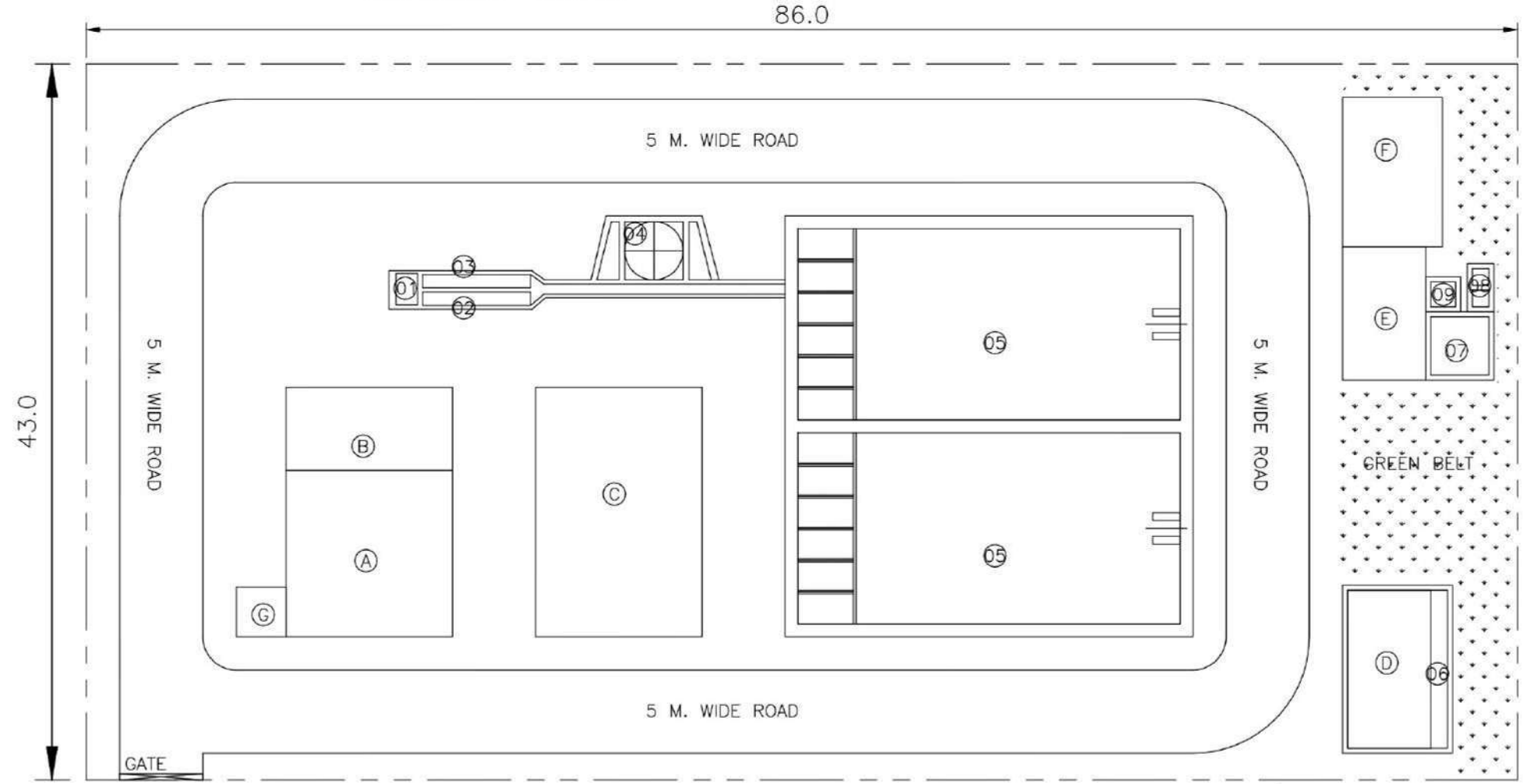
BUILDING LIST				
A	HT SUBSTATION	10[illegible] x 4500 HT.	01	
B	DG ROOM	10000 x 5000 x 4500 HT.	01	
C	ADMIN CUM SBR AIR BLOWER/ PCMC & CONTROL ROOM	15000 x 10000 x 10000 HT.	01	G+1
D	CHLORINATION CUM CHLORINE TOONER HOUSE	9500 x 5000 x 4500 HT.	01	
E	CENTRIFUGE FEED PUMP HOUSE	8000 x 5000 x 4500 HT.	01	
F	CENTRIFUGE HOUSE	9000 x 6000 x 9500 HT.	01	G(STILT)+1
G	SECURITY CABIN	3000 x 3000 x 3000 HT.	01	
H				

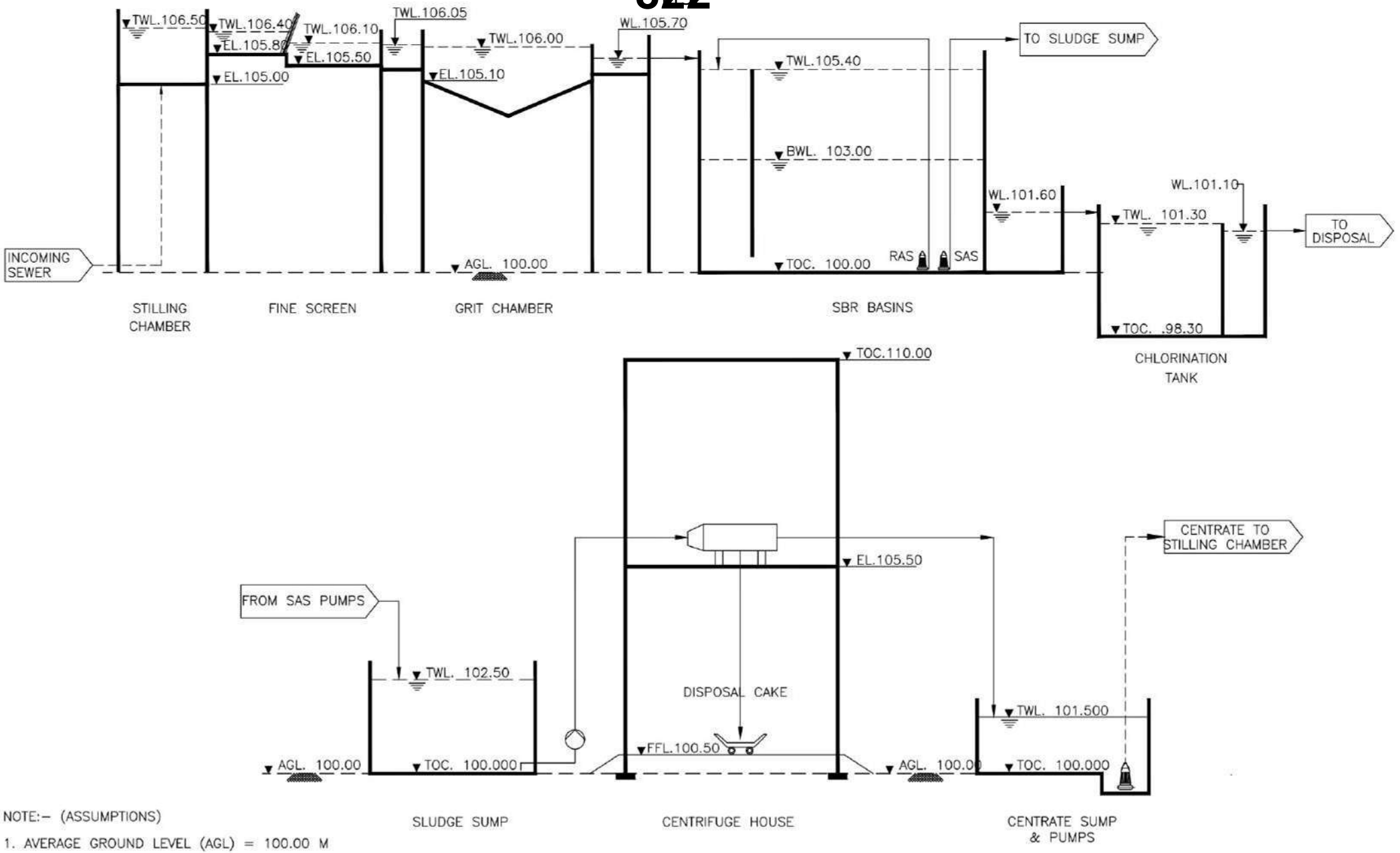
UNIT LIST				
SR.NO.	DESCRIPTION	SIZE/CAPACITY	QTY.	REMARKS
01	STILLING CHAMBER	1900 x 1300 x 1500 SWD.	01	
02	MANUAL BAR SCREEN (FINE)	6500 x 800 x 600 SWD.	01	
03	MECHANICAL BAR SCREEN (FINE)	6500 x 800 x 600 SWD.	01	
04	GRIT CHAMBER	3500 x 3500 x 900 SWD.	01	
05	SBR BASINS	23000 x 11500 x 5400 SWD.	02	
06	CHLORINATION TANK	9500 x 6000 x 3000 SWD.	01	
07	SLUDGE SUMP	3500 x 3500 x 2500 SWD.	01	
08	DWPE DOSING TANKS	1000 x 1000 x 1000 SWD.	02	
09	CENTRATE SUMP	1500 x 1500 x 1500 SWD.	01	

N

ASSUMED

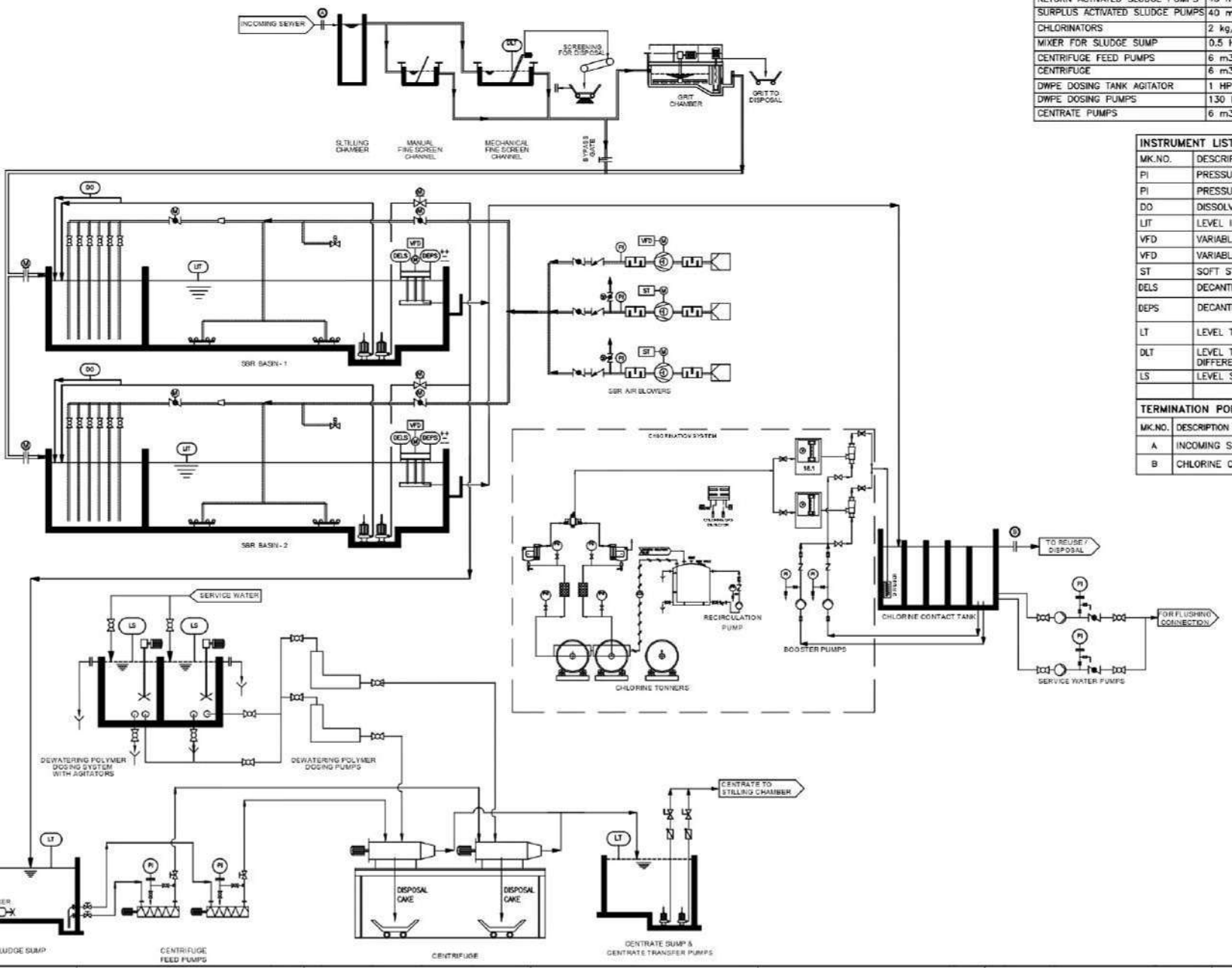
NOTE:-
AREA REQUIRED = 0.369 HA.





NOTE:– (ASSUMPTIONS)

1. AVERAGE GROUND LEVEL (AGL) = 100.00 M



EQUIPMENT LIST

DESCRIPTION	SIZE/CAPACITY	QTY.	REMARK
SBR AIR BLOWERS	1100 Nm3/hr. @ 0.64 kg/cm2	03	2W+1S
RETURN ACTIVATED SLUDGE PUMPS	45 m3/hr. @ 5 MWC	02	2W+1SS
SURPLUS ACTIVATED SLUDGE PUMPS	40 m3/hr. @ 10 MWC	02	2W+1SS
CHLORINATORS	2 kg/hr	02	1W+1S
MIXER FOR SLUDGE SUMP	0.5 HP	01	1W
CENTRIFUGE FEED PUMPS	6 m3/hr. @ 25 MWC	02	1W+1S
CENTRIFUGE	6 m3/hr	02	1W+1S
DWPE DOSING TANK AGITATOR	1 HP @ 100 RPM	02	2W
DWPE DOSING PUMPS	130 LPH @ 4.0 kg/cm2	02	1W+1S
CENTRATE PUMPS	6 m3/hr. @ 15 MWC	02	1W+1S

INSTRUMENT LIST

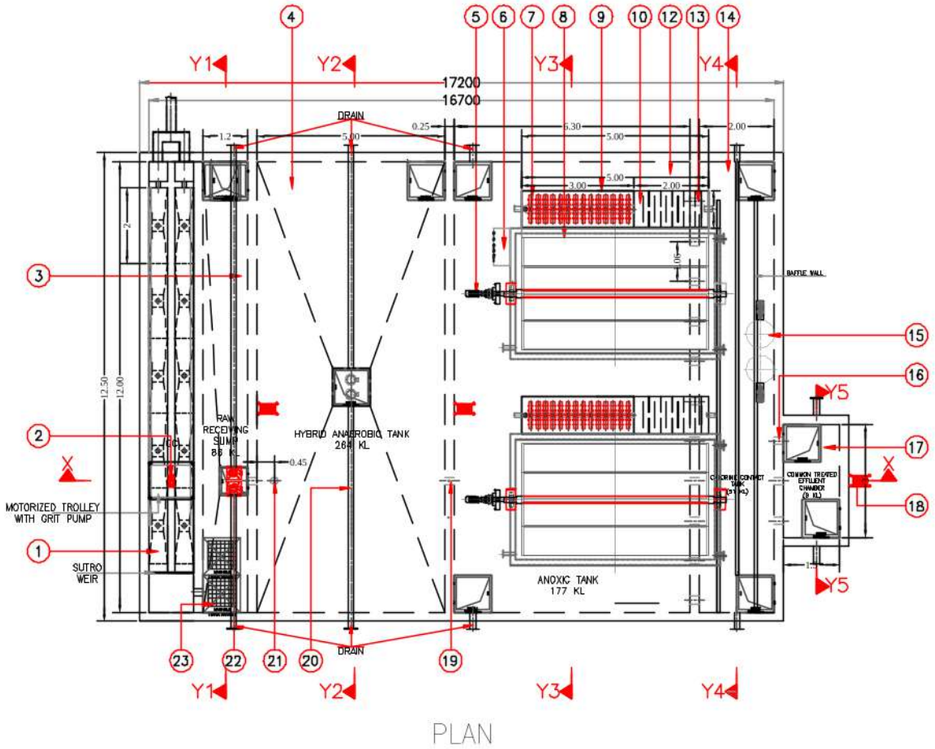
MK.NO.	DESCRIPTION	REMARK
PI	PRESSURE GAUGES	BOURDON TYPE
PI	PRESSURE GAUGES	DIAPHRAGM TYPE
DO	DISSOLVED OXYGEN METER	IMMERSION TYPE
LIT	LEVEL INDICATOR TRANSMITTER	HYDROSTATIC TYPE
VFD	VARIABLE FREQUENCY DRIVE	FOR BLOWERS
VFD	VARIABLE FREQUENCY DRIVE	FOR DECANTERS
ST	SOFT STARTER	FOR BLOWER
DELS	DECANTER LEVEL SENSOR	CAPACITIVE TYPE
DEPS	DECANTER POSITION SENSOR	MAGNETIC LIMIT SWITCH
LT	LEVEL TRANSMITTER	ULTRASONIC TYPE
DLT	LEVEL TRANSMITTER DIFFERENTIAL	ULTRASONIC TYPE
LS	LEVEL SWITCH	CAPACITANCE TYPE

TERMINATION POINT

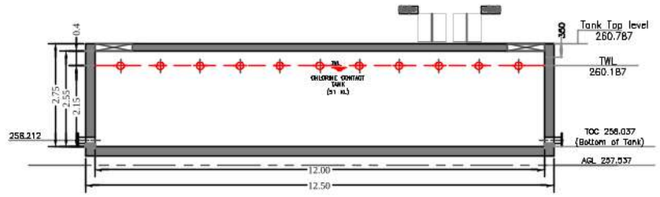
MK.NO.	DESCRIPTION
A	INCOMING SEWER
B	CHLORINE CONTACT TANK

LINE LEGEND
- RAS LINE
- SAS LINE
- AIR LINE
- INSTRUMENT SIGNAL
- DRAIN LINE
- RCC CHANNEL

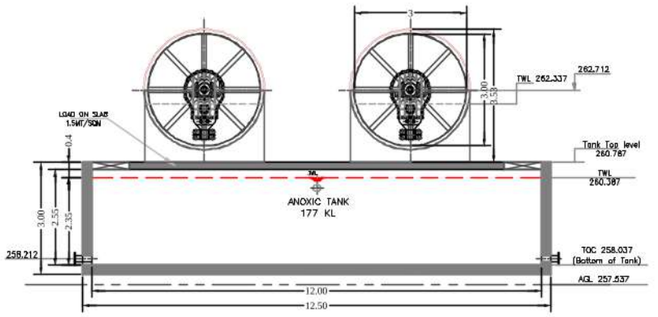
LEGEND
- NON-RETURN VALVE
- BUTTERFLY VALVE
- MOTORISED BUTTERFLY VALVE
- CHANNEL MOUNTED MOTORISED GATE
- KNIFE GATE VALVE
- BALL VALVE
- NEEDLE VALVE
- VFD — VARIABLE FREQUENCY DRIVE
- ST — SOFT STARTER
- M — MOTOR
- AB — AIR BLOWER
- SILENCER
- FILTER



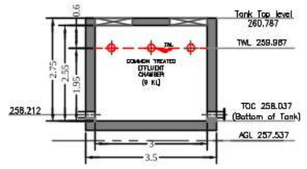
PLAN



SECTION Y4–Y4



SECTION Y3–Y3



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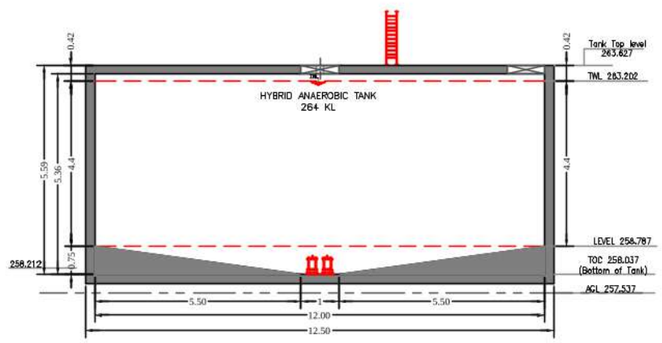

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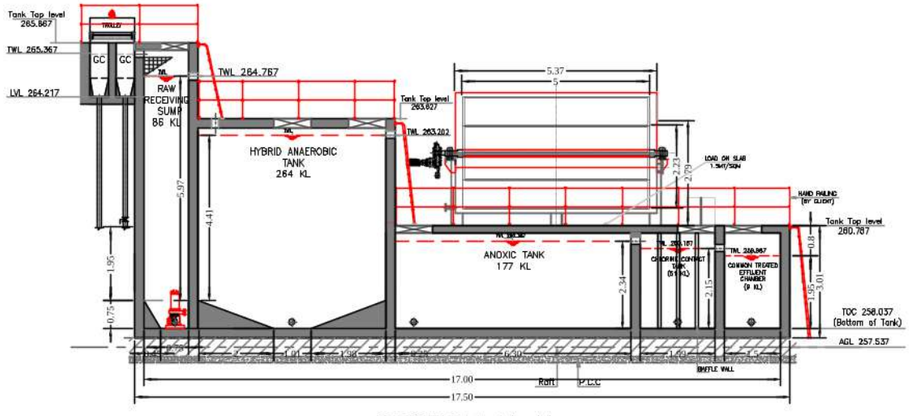
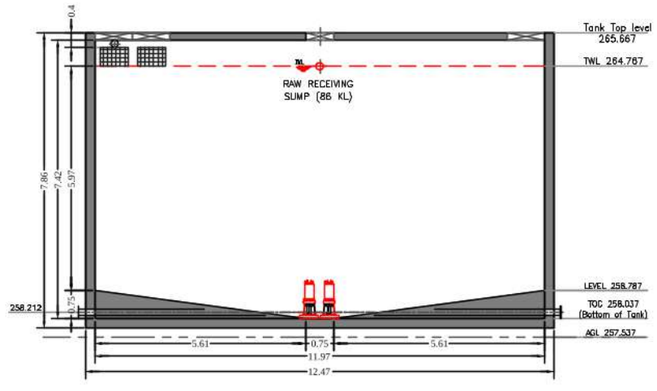


SECTION X–X

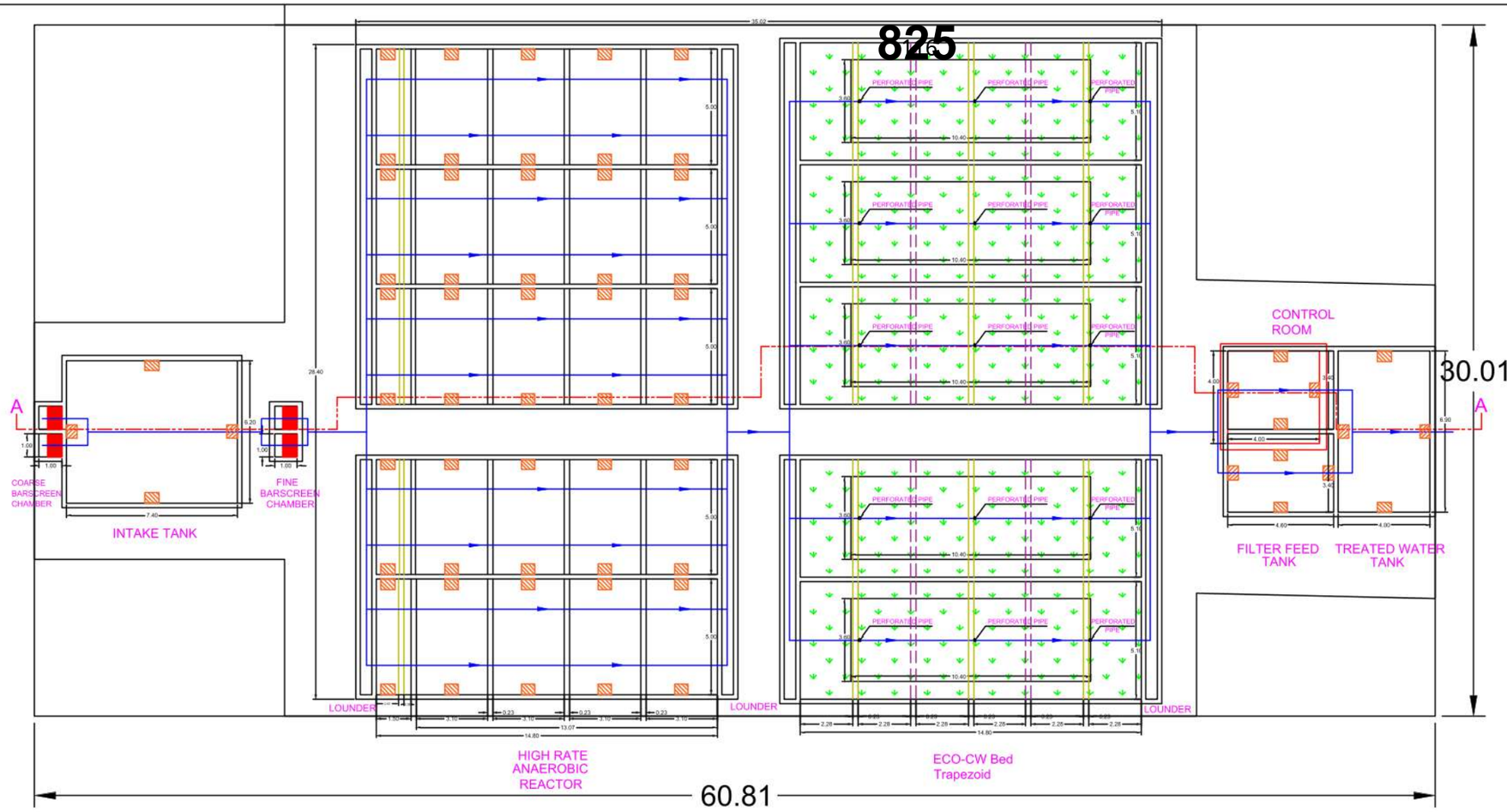


SECTION Y1–Y1

1	GRIT CHANNEL	
2	GRIT REMOVAL PUMP (1 NO)	
3	RAW RECEIVING SUMP	
4	HYBRID ANAROBIC TANK	
5	GEAR BOX & MOTOR	
6	CONTROL PANEL	
7	BIOFILM SEPRATOR	
8	ROTATING MEDIA BIOREACTOR	
9	FILTER FEED SUMP	
10	FLOCCULATION CHANNEL	
12	ANOXIC TANK	
13	CHLORINE CONTACT TANK INLET	ø200mm
14	CHLORINE CONTACT TANK	
15	DOSING TANK & PUMPS	
16	COMMON TREATED EFFLUENT CHAMBER INLET	
17	COMMON TREATED EFFLUENT CHAMBER	
18	LADDERS (BY CLIENT)	
19	HYBRID ANAEROBIC TANK INLET	ø200mm
20	SLUDGE PUMPS	
21	HYBRID ANAEROBIC TANK OUTLET	ø200mm
22	SUBMERGED MIXER	
23	BAR SCREEN (1W+1S)	750X750mm

NAIK ENVIRONMENTAL ENGINEERS PVT. LTD.

PROJECT:	MP		
TITLE:	2 MLD STP – G.A.		
CLIENT:			
DRN. BY	N.P	DRAWING NO.:	DATE: 20/09/23
CHKD. BY	M.K		SCALE: NTS
APPD. BY	SSN	NEE/MP/STP/00	REV: 00



NOTES:-

1) ALL DIAMENSIONS AND LEVELS ARE IN METER.
2) DIMENSIONS ARE NOT TO BE SCALED FROM DRAWING.
3) THIS DRAWING SHALL NOT BE USED FOR CONSTRUCTION UNLESS APPROVED BY COMPETENT AUTHORITY.
4) ALL LEVELS ARE INDICATIVE & SUBJECT TO ACTUAL INVERT LEVEL OF SEWAGE INPUT & GROUND LVL.
5) MEASURMENT OF WASTE WATER INVERT LVL.= 1.50 m (4.92 ft.) BELOW GROUND LEVEL IS CONSIDERED.
6) ALL BAFFLE WALL AND INNER WALL OF PHYTORID BED ARE IN BRICKWORK.

NORTH

PHYTOREMEDIATION (ECO-CW) BASED SEWAGE TREATMENT PLANT GENERAL ARRANGEMENT DRAWING

LEGEND

SR.NO.	SYMBOL	DISCRIPTION
1.		WATER FLOW
2.		FREE BOARD LEVEL
3.		PLANTATION BED
4.		CONCRETE
5.		SECTION LINE
6.		BAFFLE WALL BOTTOM OPEN
7.		BAFFLE WALL TOP OPEN
8.		BRICKWORK

CLIENT :-

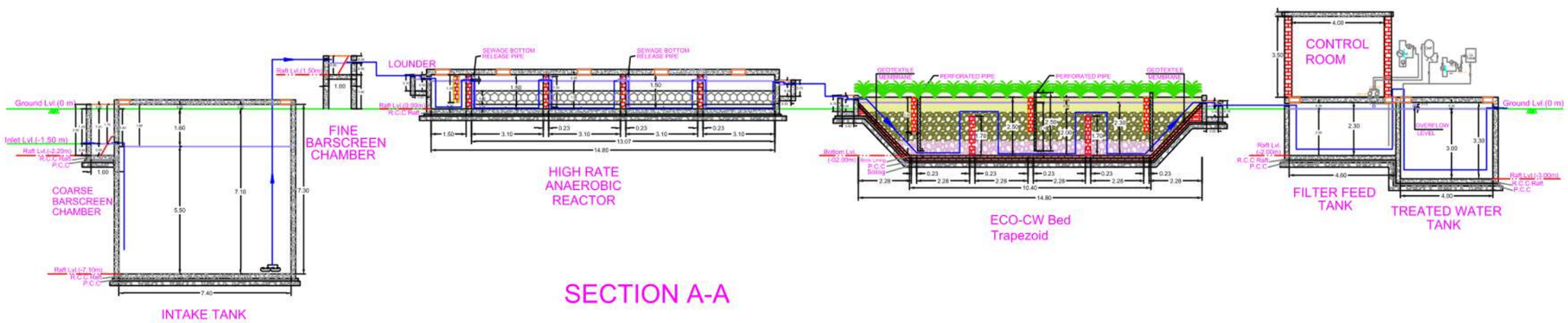
PROJECT :- 1000 KLD STP

DRAWING TITLE:-GENERAL ARRANGEMENT DRAWING WITH SECTIONAL DETAILS.

DRAWING NAME :-

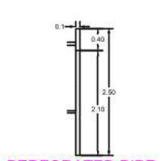
DATE:-

ECO-CW STP PLAN



SECTION A-A

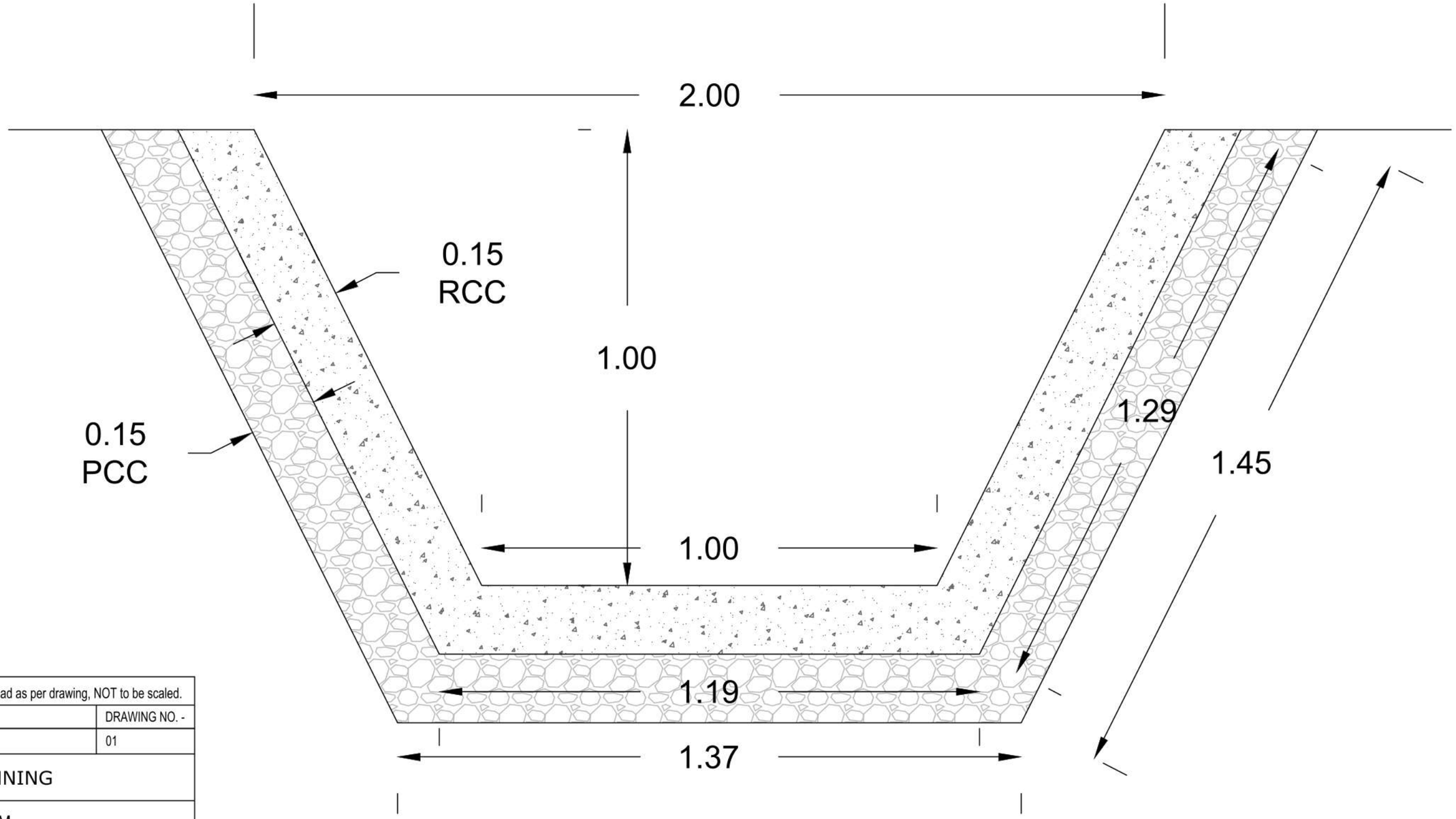
Sr. No.	Tanks	Length (m)	Width/dia (m)	Depth (m)	Plus Free Board (m)	Beds (nos)	Wall thickness (m)
1	Coarse Bar Screen Chamber	1	1	0.5	1.8	2	0.2
2	Intake Well /Tank	7.4	6.2	5.5	1.8	1	0.2
3	Fine Bar Screen Chamber	1	1	0.5	0.3	2	0.2
4	High Rate Anaerobic Reactor	14.8	5.0	1.2	0.3	5	0.2
5	ECO-CW Bed Trapezoid Top	14.8	5.1	2.3	0.2	5	0.2
6	ECO-CW Bed Trapezoid Bottom	10.4	3.6	0	0	0	0.2
7	Filter Feed Tank	4.6	3.4	2	0.3	2	0.2
8	Treated Water Tank	4.0	6.9	3	0.3	1	0.2
9	Control Room	4	4	3.5	0	1	0.3
10	Inlet & Outlet lounder (with various beds)	100.88	0.5	0.5	0.2	1	0.2



PERFORATED PIPE

DETAILS OF PERFORATED PIPE IN PHYTORID TANK:-

SR.NO.	NOMINAL PIPE SIZE	HOLE SIZE	HOLE SPACING	HOLE ROWS
1.	4"	3/8"	3"±1/4"	2@90°(±3°)
2.	6"-10"	3/8"	3"±1/4"	2@90°(±3°)



Note - All Dimensions are to be read as per drawing, NOT to be scaled.		
DRAWN BY - N. K.		DRAWING NO. -
CHECKED BY - J. R.		01
TITLE - CANAL LINNING		
PROJECT TITLE - SBM		
CLIENT -		

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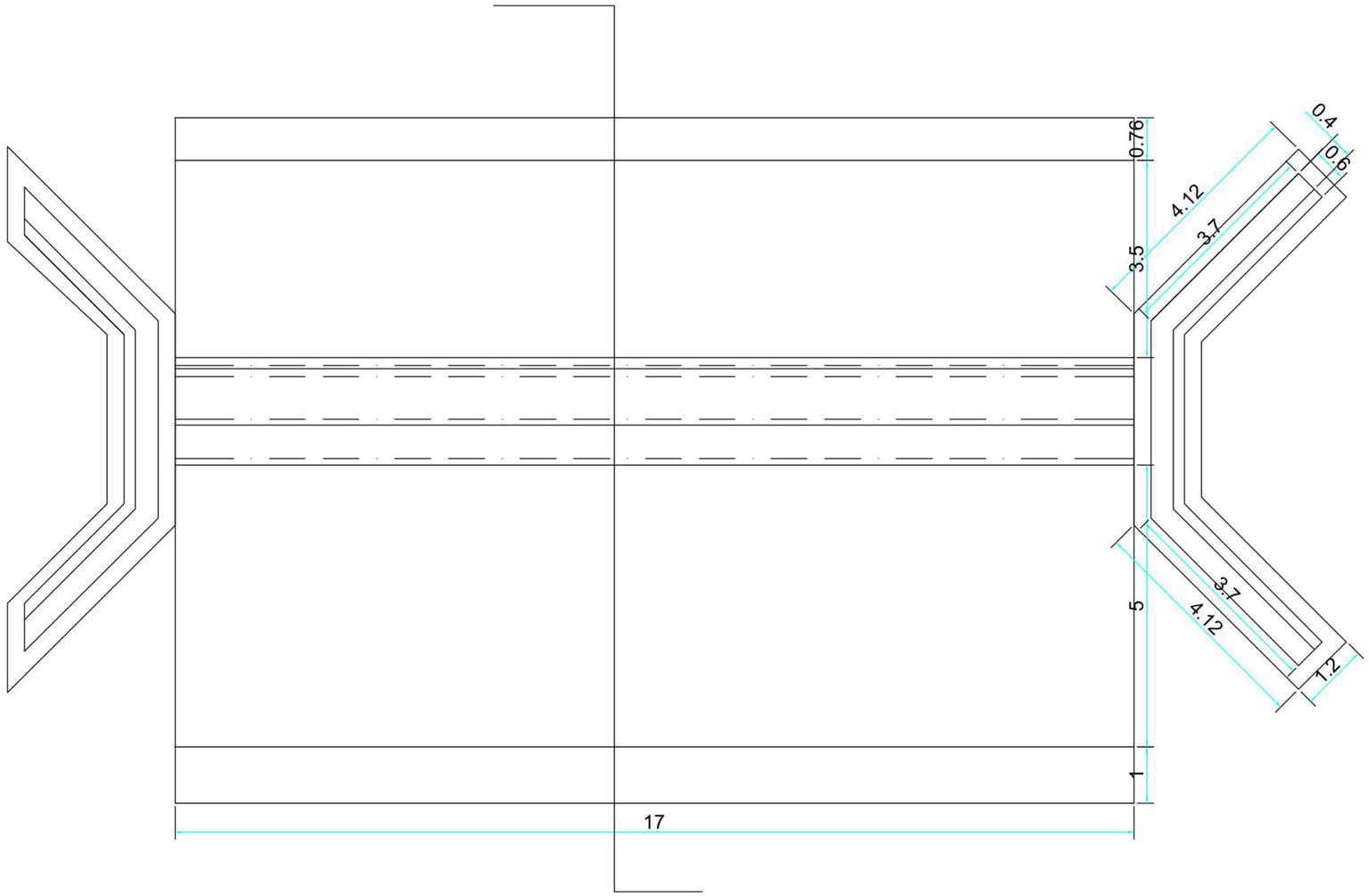
ARCHITECTS + PLANNERS + ENGINEERS

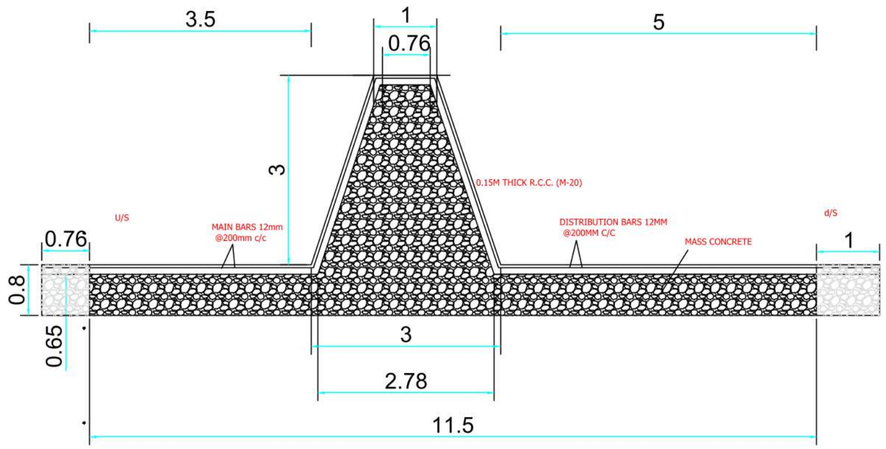
INTERIOR DESIGNERS + PROJECT MANAGEMENT

Bhopal, Madhya Pradesh

Email :- abr.associates0026@gmail.com



PLAN



SECTION

Note - All Dimensions are to be read as per drawing, NOT to be scaled.		
DRAWN BY - A. K.		DRAWING NO. -
CHECKED BY - J. R.	DATE - 13-02-2024	
DRAWING TITLE - STOP DAM		
PROJECT TITLE - LWM PROJECT		
CLIENT -		

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Bhopal, Madhya Pradesh
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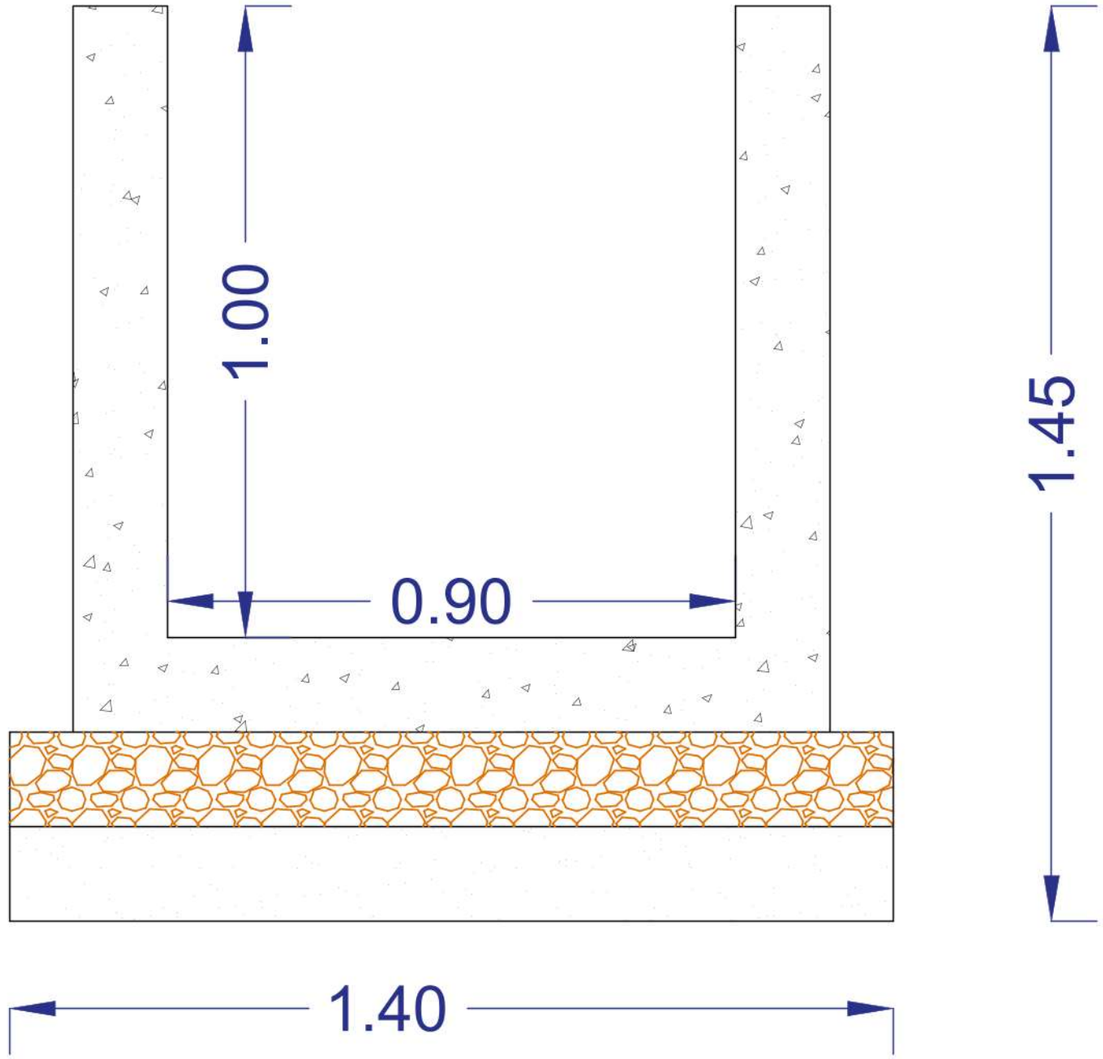

Note - All Dimensions are to be read as per drawing, NOT to be scaled.		
DRAWN BY - N. K.		DRAWING NO. -
CHECKED BY - J. R.		01
TITLE - NALLAH SECTION		
PROJECT TITLE - SBM		
CLIENT -		

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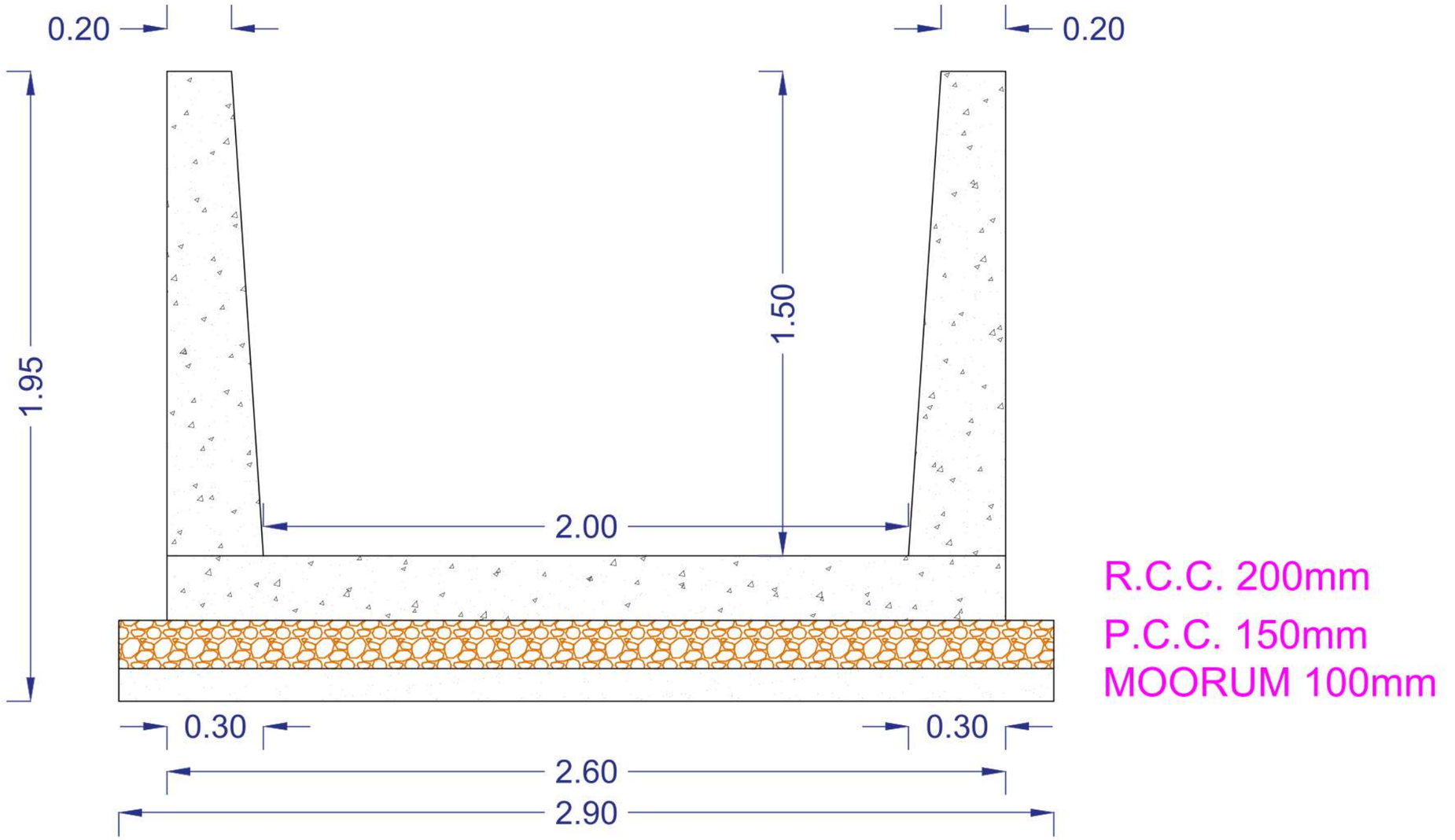

Note - All Dimensions are to be read as per drawing, NOT to be scaled.

DRAWN BY - N. K.		DRAWING NO. -
CHECKED BY - J. R.		01

TITLE - NALLAH SECTION

PROJECT TITLE - SBM

CLIENT -

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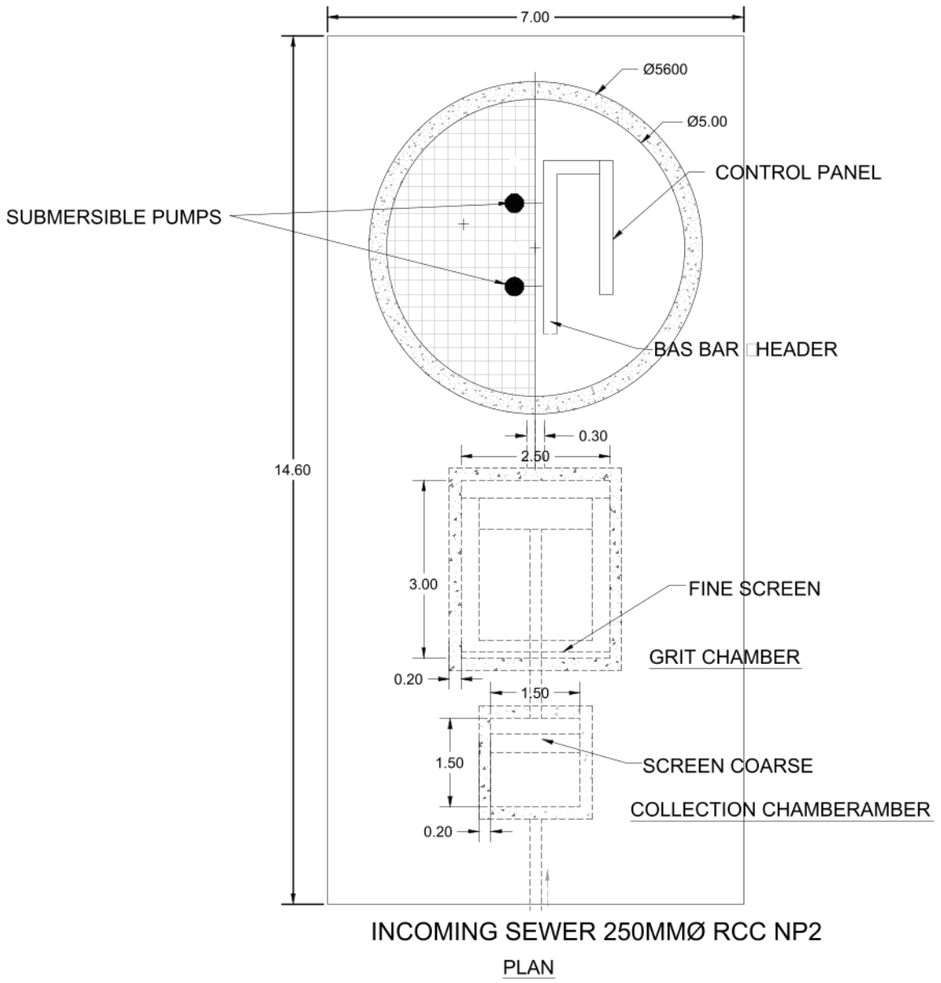
Email :- abr.associates0026@gmail.com

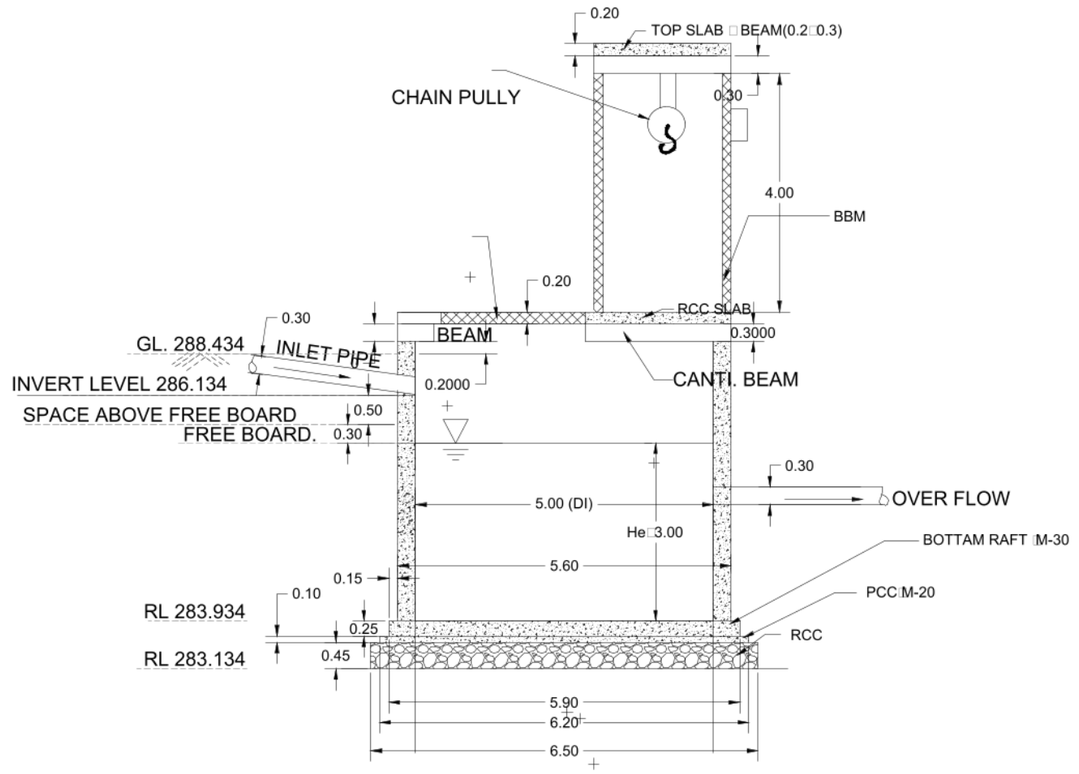
PUMPING STATION DRAWING FOR BALAGHAT WATER SUPPLY PRO□ECT



INCOMING SEWER 250MMØ RCC NP2

PLAN

SPS-1-SEWAGE PUMPING STATION



PRO□ECT□

WATER SUPPLY SCHEME FOR BALAGHAT UNDER AMRUT 2.0

TITLE□

PUMPING STATION DRAWING FOR BALAGHAT WATER SUPPLY PROJECT UNDER AMRUT 2.0

CLIENT□

NAGAR PALIKA PARISHAD, BALAGHAT

CONSULTANT□

ABR ARCHITECTURE & ASSOCIATES PVT.LTD.

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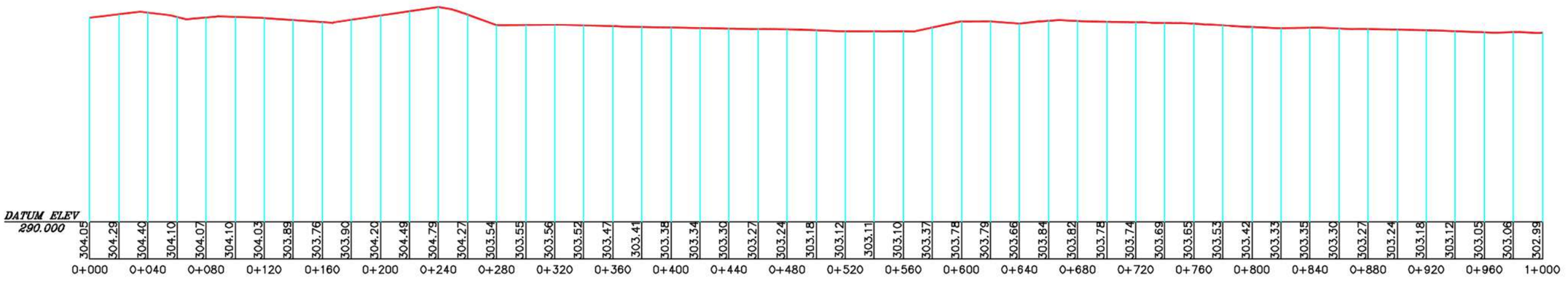
ARCHITECTS □ PLANNERS □ ENGINEERS

INTERIOR DESIGNERS □ PRO□ECT MANAGEMENT

Bhopal, Madhya Pradesh

Email :- abr.associates0026@gmail.com

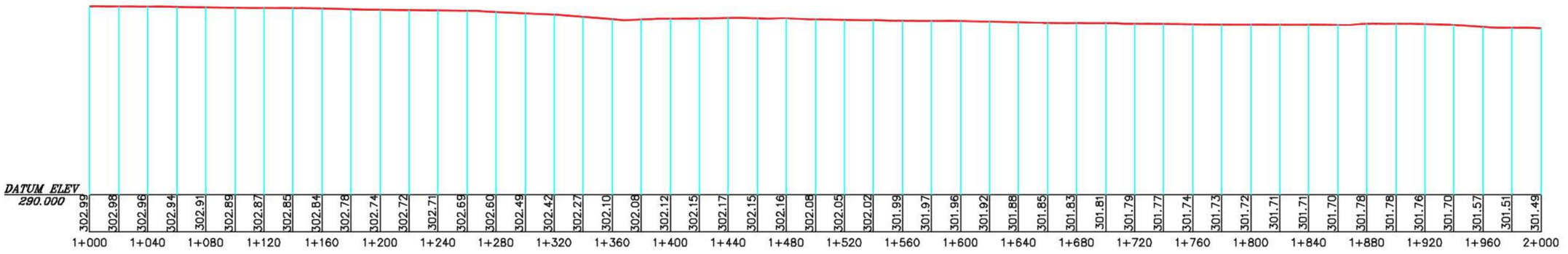
L SECTION OF CANAL 1 (00-1000 M)



DRAIN BED LEVEL	
TITLE: L- SECTION	
PROJECT: LWM PROJECT	
CONSULTANT: ABR ARCHITECTURE AND ASSOCIATES PVT. LTD.RAIPUR	

SHEET NO.-01	DRAWN BY: ST	CHECKED BY: AP	APPROVED BY: PA
SIZE: A3	DRAWING NUMBER: L- SECTION - BAL-01.		SCALE: NTS

L SECTION OF CANAL 1 (1000-2000 M)



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CONSULTANT: ABR ARCHITECTURE AND ASSOCIATES PVT. LTD.RAIPUR	

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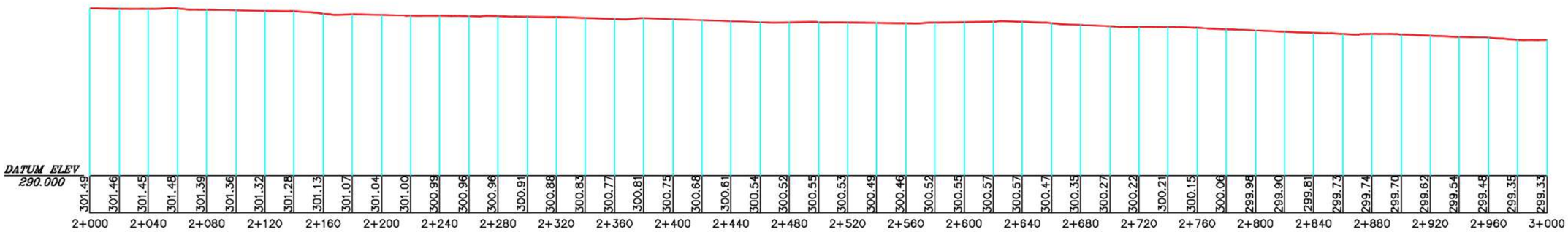
L SECTION OF CANAL 1 (2000-3000 M)



DRAIN BED LEVEL

TITLE:
L- SECTION

PROJECT:
LWM PROJECT

CONSULTANT:
ABR ARCHITECTURE AND ASSOCIATES PVT. LTD.RAIPUR

SHEET NO.-01	DRAWN BY: ST	CHECKED BY: AP	APPROVED BY: PA
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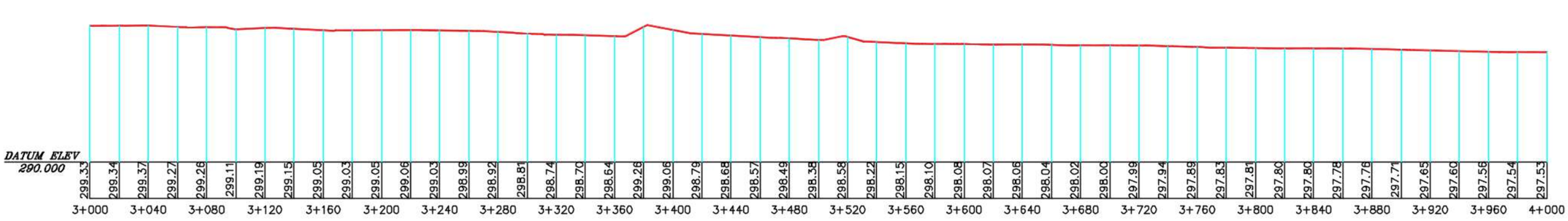
L SECTION OF CANAL 1 (3000-4000 M)



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PROJECT: LWM PROJECT	
CONSULTANT: ABR ARCHITECTURE AND ASSOCIATES PVT. LTD.RAIPUR	

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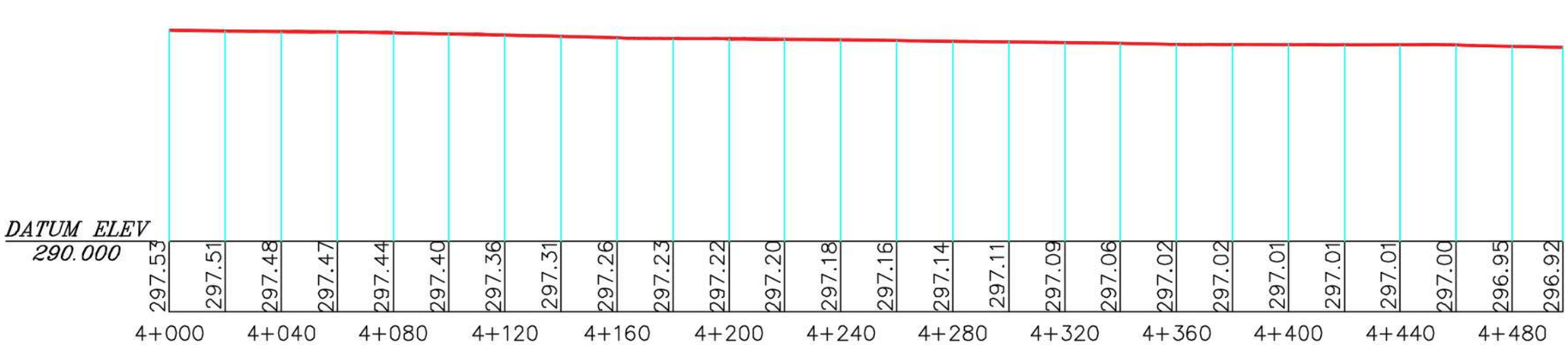
L SECTION OF CANAL 1 (3000-4000 M)



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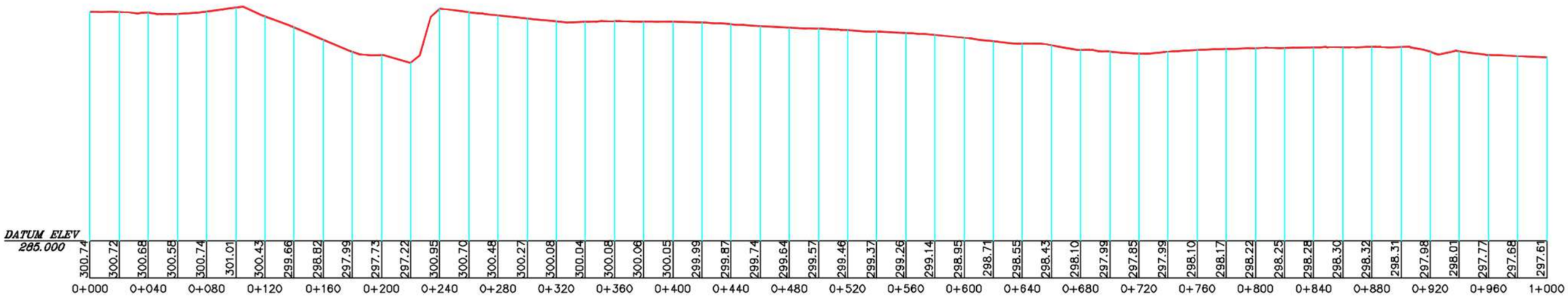
PROJECT: LWM PROJECT	
CONSULTANT: ABR ARCHITECTURE AND ASSOCIATES PVT. LTD.RAIPUR	

SHEET NO.-01	DRAWN BY: ST	CHECKED BY: AP	APPROVED BY: PA
SIZE: A3	DRAWING NUMBER: L- SECTION - BAL-01.		SCALE: NTS

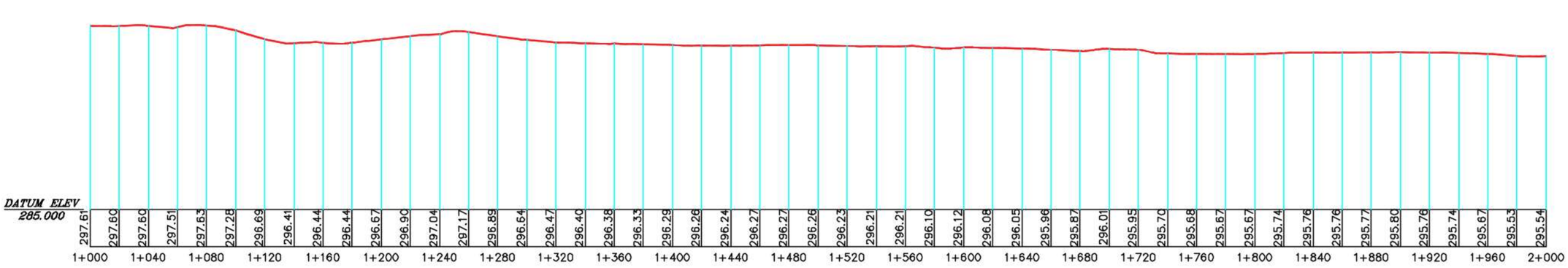
L SECTION OF CANAL 2 (00-1000 M)



DRAIN BED LEVEL	
TITLE: L- SECTION	
PROJECT: LWM PROJECT	
CONSULTANT: ABR ARCHITECTURE AND ASSOCIATES PVT. LTD.RAIPUR	

SHEET NO.-02	DRAWN BY: ST	CHECKED BY: AP	APPROVED BY: PA
SIZE: A3	DRAWING NUMBER: L- SECTION - BAL-02.		SCALE: NTS

L SECTION OF CANAL 2 (1000-2000 M)



DRAIN BED LEVEL	

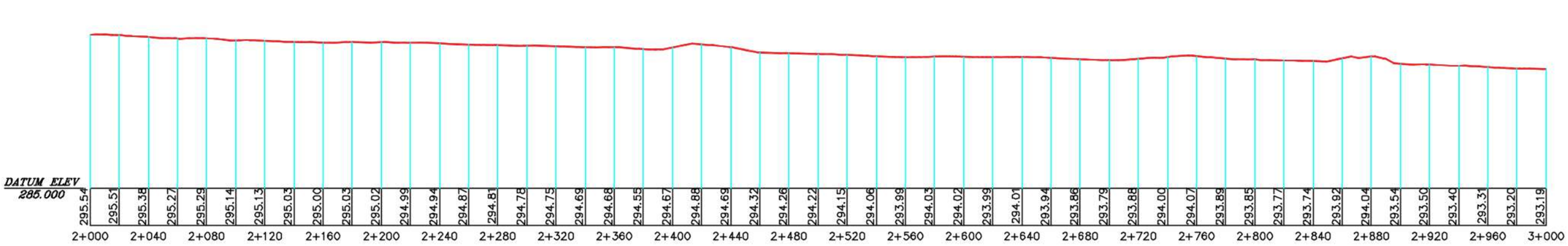
TITLE:
L- SECTION

PROJECT:
LWM PROJECT

CONSULTANT:
ABR ARCHITECTURE AND ASSOCIATES PVT. LTD.RAIPUR

SHEET NO.-02	DRAWN BY: ST	CHECKED BY: AP	APPROVED BY: PA
SIZE: A3	DRAWING NUMBER: L- SECTION - BAL-02.		SCALE: NTS

L SECTION OF CANAL 2 (2000-3000 M)



DRAIN BED LEVEL	
TITLE: L- SECTION	
PROJECT: LWM PROJECT	
CONSULTANT: ABR ARCHITECTURE AND ASSOCIATES PVT. LTD.RAIPUR	

SHEET NO.-02	DRAWN BY: ST	CHECKED BY: AP	APPROVED BY: PA
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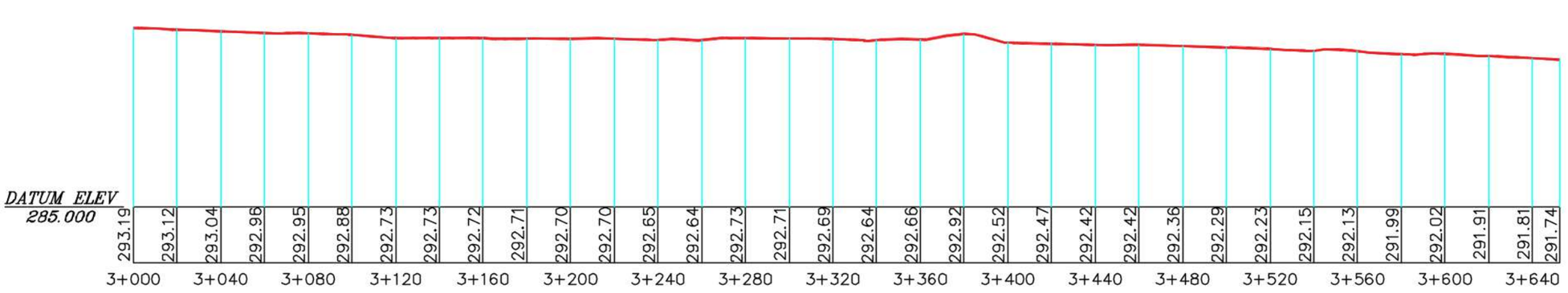
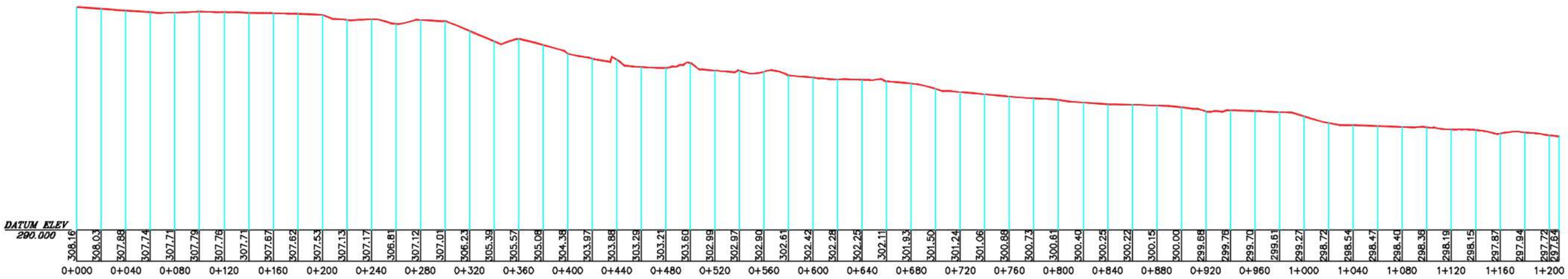
L SECTION OF CANAL 2 (3000-3640 M)



DRAIN BED LEVEL	
TITLE: L- SECTION	
PROJECT: LWM PROJECT	
CONSULTANT: ABR ARCHITECTURE AND ASSOCIATES PVT. LTD.RAIPUR	

SHEET NO.-02	DRAWN BY: ST	CHECKED BY: AP	APPROVED BY: PA
SIZE: A3	DRAWING NUMBER: L- SECTION - BAL-02.		SCALE: NTS

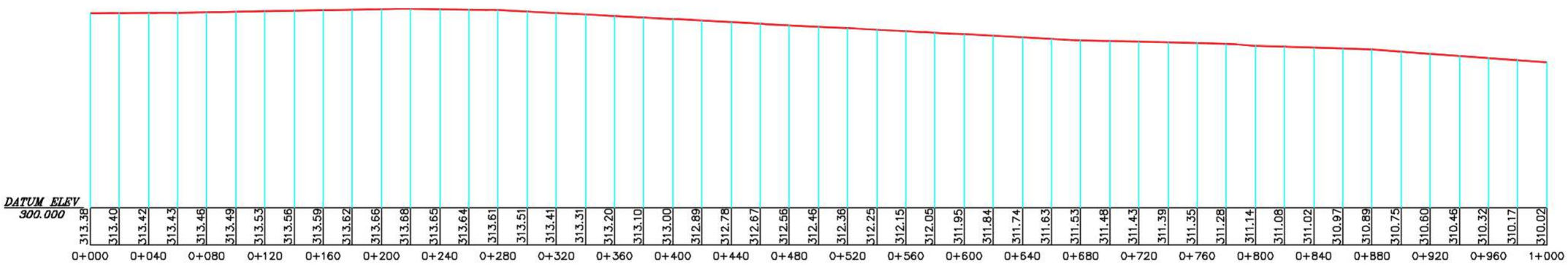
L SECTION OF CANAL 3 (00-1200 M)



DRAIN BED LEVEL	
TITLE: L- SECTION	
PROJECT: LWM PROJECT	
CONSULTANT: ABR ARCHITECTURE AND ASSOCIATES PVT. LTD.RAIPUR	

SHEET NO.-03	DRAWN BY: ST	CHECKED BY: AP	APPROVED BY: PA
SIZE: A3	DRAWING NUMBER: L- SECTION - BAL-03.		SCALE: NTS

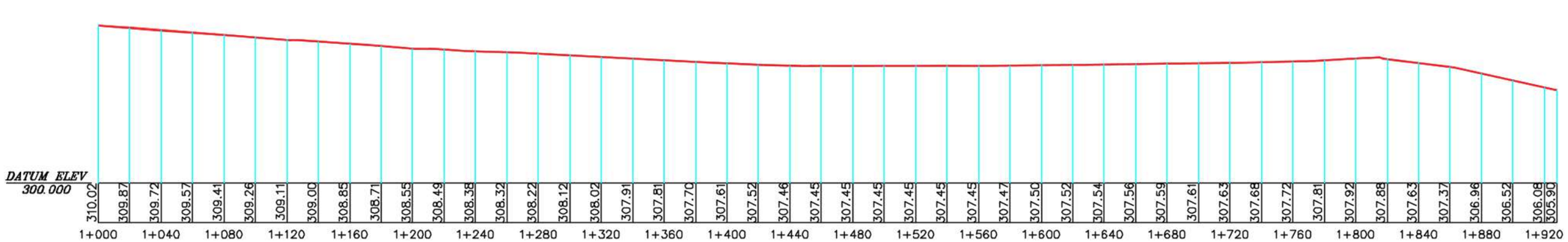
L SECTION OF NALA 1 (00-1000 M)



DRAIN BED LEVEL	
TITLE: L- SECTION	
PROJECT: LWM PROJECT	
CONSULTANT: ABR ARCHITECTURE AND ASSOCIATES PVT. LTD.RAIPUR	

SHEET NO.-04	DRAWN BY: ST	CHECKED BY: AP	APPROVED BY: PA
SIZE: A3	DRAWING NUMBER: L- SECTION - BAL-04.		SCALE: NTS

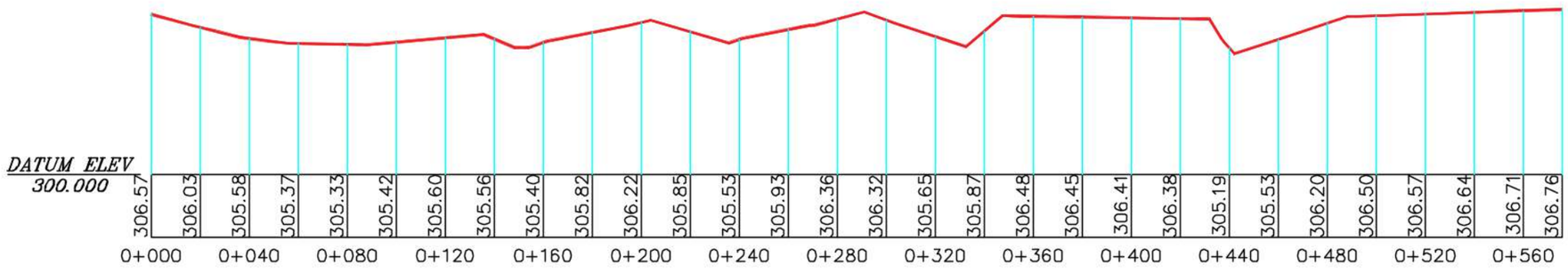
L SECTION OF NALA 1 (1000-1950 M)



DRAIN BED LEVEL	
TITLE: L- SECTION	
PROJECT: LWM PROJECT	
CONSULTANT: ABR ARCHITECTURE AND ASSOCIATES PVT. LTD.RAIPUR	

SHEET NO.-04	DRAWN BY: ST	CHECKED BY: AP	APPROVED BY: PA
SIZE: A3	DRAWING NUMBER: L- SECTION - BAL-04.		SCALE: NTS

L SECTION OF NALA 2 (00-576 M)



DRAIN BED LEVEL

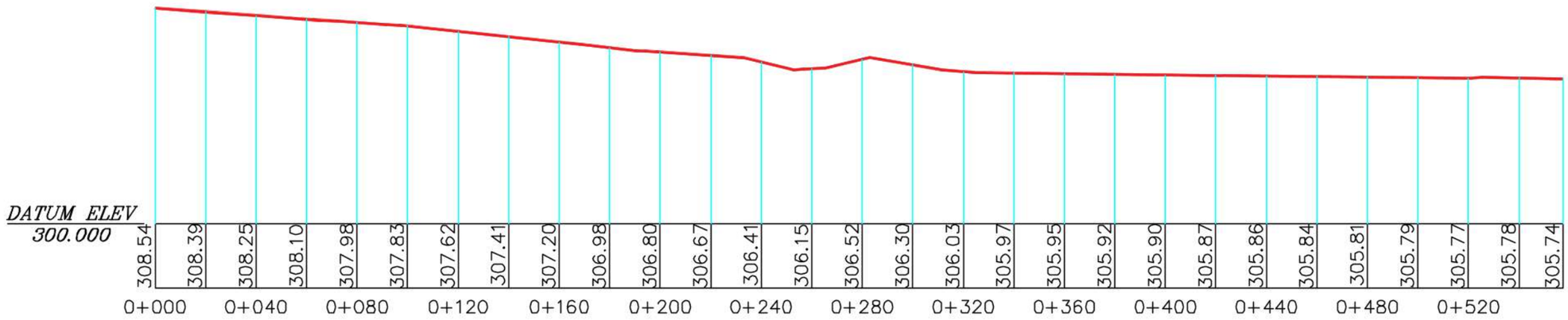
TITLE:
L- SECTION

PROJECT:
LWM PROJECT

CONSULTANT:
ABR ARCHITECTURE AND ASSOCIATES PVT. LTD.RAIPUR

SHEET NO.-04	DRAWN BY: ST	CHECKED BY: AP	APPROVED BY: PA
SIZE: A3	DRAWING NUMBER: L- SECTION - BAL-04.		SCALE: NTS

L SECTION OF NALA 3 (00-560 M)



DRAIN BED LEVEL	

TITLE:
L- SECTION

PROJECT:
LWM PROJECT

CONSULTANT:
ABR ARCHITECTURE AND ASSOCIATES PVT. LTD.RAIPUR

SHEET NO.-04	DRAWN BY: ST	CHECKED BY: AP	APPROVED BY: PA
SIZE: A3	DRAWING NUMBER: L- SECTION - BAL-04.		SCALE: NTS

कार्यालय नगरपालिका परिषद बालाघाट जि.बालाघाट(म.प्र.) पिन कोड 481001
दूरभाष/फैक्स क्रमांक 07632-241377 एवं ईमेल cmobalaghat@mpurban.gov.in

क्रमांकः एफ-...../लोनिवि./2026/12320 बालाघाट दिनांक-02...../01/2026

-/कार्यादेश/-

प्रति,

मेसर्स वेस्ट इंडिया कंस्ट्रक्शन कंपनी
श्री अशोक कुमार जैन, संविदाकार
वेस्टर्न चेंबर, 1/3, आकाश गंगा,
भिलाई, छ.ग.

विषय-नगरपालिका परिषद सीमाक्षेत्रांतर्गत SETUP SEWAGE TREATMENT PLANT FOR USED WATER MANAGEMENT FOR BLALAGHAT TOWN कार्य किये जाने कार्य।

संदर्भ- आपके द्वारा प्रस्तुत ऑनलाईन निविदा सूचना क्रमांक 435347-1 दिनांक 07/07/2025

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उपरोक्त विषयांतर्गत लेख है कि आपके द्वारा प्रस्तुत निविदा दिनांक 08/08/2025 के द्वारा स्वीकृत की गई है। तदानुसार नियत् एवं शर्तो एवं अवधि के अंदर कार्य संपादित करना सुनिश्चित करें।

नगरपालिका के लिए निम्न विवरण अनुसार कार्य करना स्वीकृत किया जाता है।

1	कार्य का नाम	INTERCEPTION & DIVERSION WORK FOR TAPPING NALLAH AND SETUP SEWAGE TREATMENT PLANT FOR USED WATER MANAGEMENT FOR BLALAGHAT TOWN
2	अनुमानित राशि	30,82,13,000=00
3	स्वीकृति निधि विवरण	SBM 2.0
4	प्रशासकीय एवं वित्तीय स्वीकृति	परिषद/पी.आई.सी.के प्रस्ताव क्रं. ..... दिनांक ...../...../2025
5	निविदा सूचना क्रमांक व दिनांक	निविदा सूचना क्रमांक 435347-1 दिनांक 07/07/2025
6	दर स्वीकृति कमांक व दिनॉक	पी.आई.सी.के प्रस्ताव क्रं. 796 दिनांक 16/09/2025
7	अनुबंध दिनांक	दिनांक 02/01/2026
8	संविदाकार का नाम	मेसर्स वेस्ट इंडिया कंस्ट्रक्शन कंपनी, द्वारा श्री अशोक कुमार जैन वेस्टर्न चेंबर, 1/3, आकाश गंगा, भिलाई, छ.ग.
9	निविदा स्वीकृत दर	एस.ओ.आर.दर से 10 प्रतिशत कम
10	स्वीकृत राशि	27,73,92,006=00
11	कार्य पूर्ण करने का दिनांक	18 माह दिनांक 02/07/2027

अतः मेसर्स वेस्ट इंडिया कंस्ट्रक्शन कंपनी, द्वारा श्री अशोक कुमार जैन वेस्टर्न चेंबर, 1/3, आकाश गंगा, भिलाई, छ.ग. निर्धारण मापदण्ड़ एवं स्पेशीफिकेशन अनुसार कार्य पूर्ण करें।

मुख्य नगरपालिका अधिकारी
नगरपालिका परिषद बालाघाट
जिला-बालाघाट (म.प्र.)

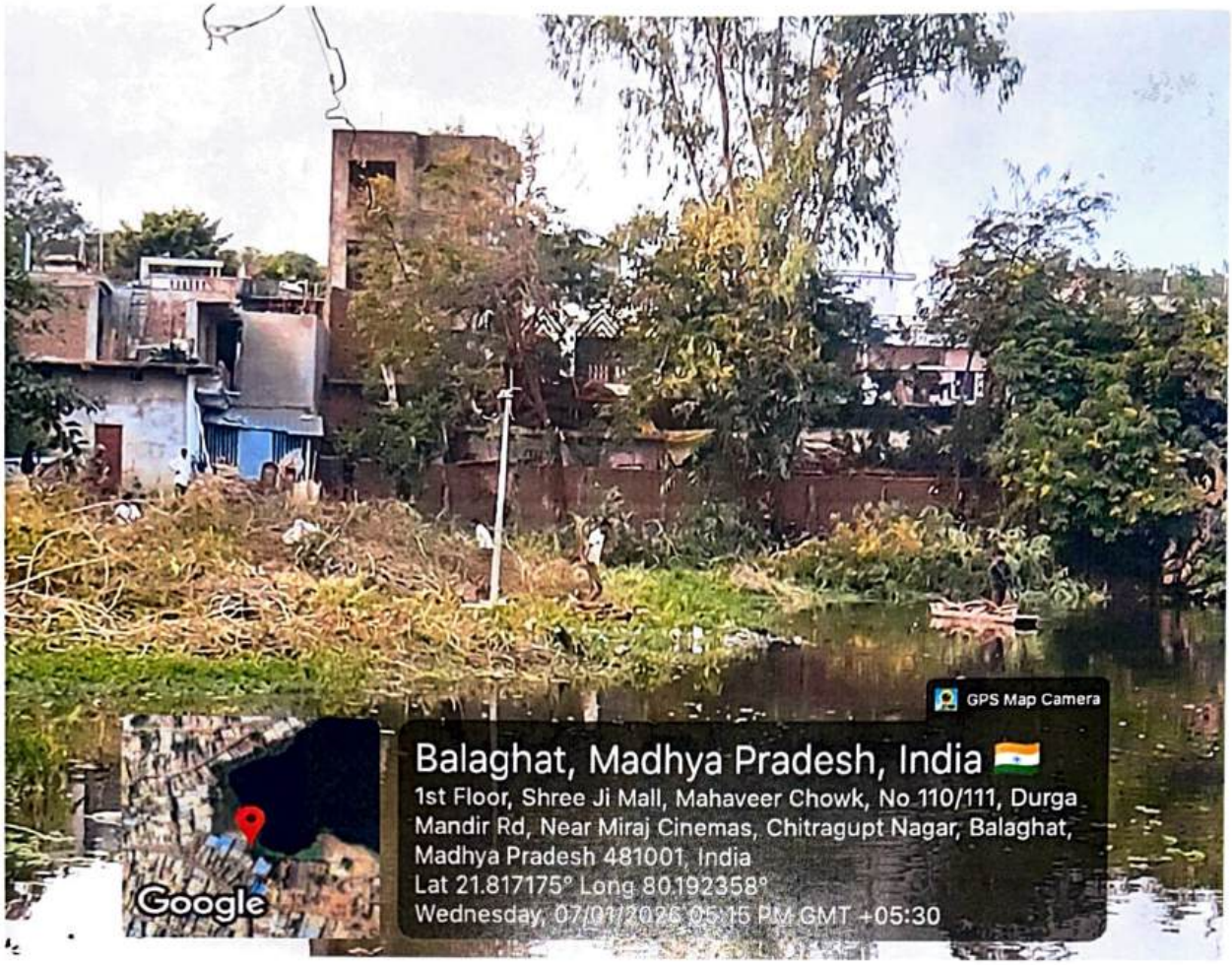
पृ.क्रं. एफ-...../लोनिवि./2026/1232 बालाघाट दिनांक-02...../01/2026

प्रतिलिपि-

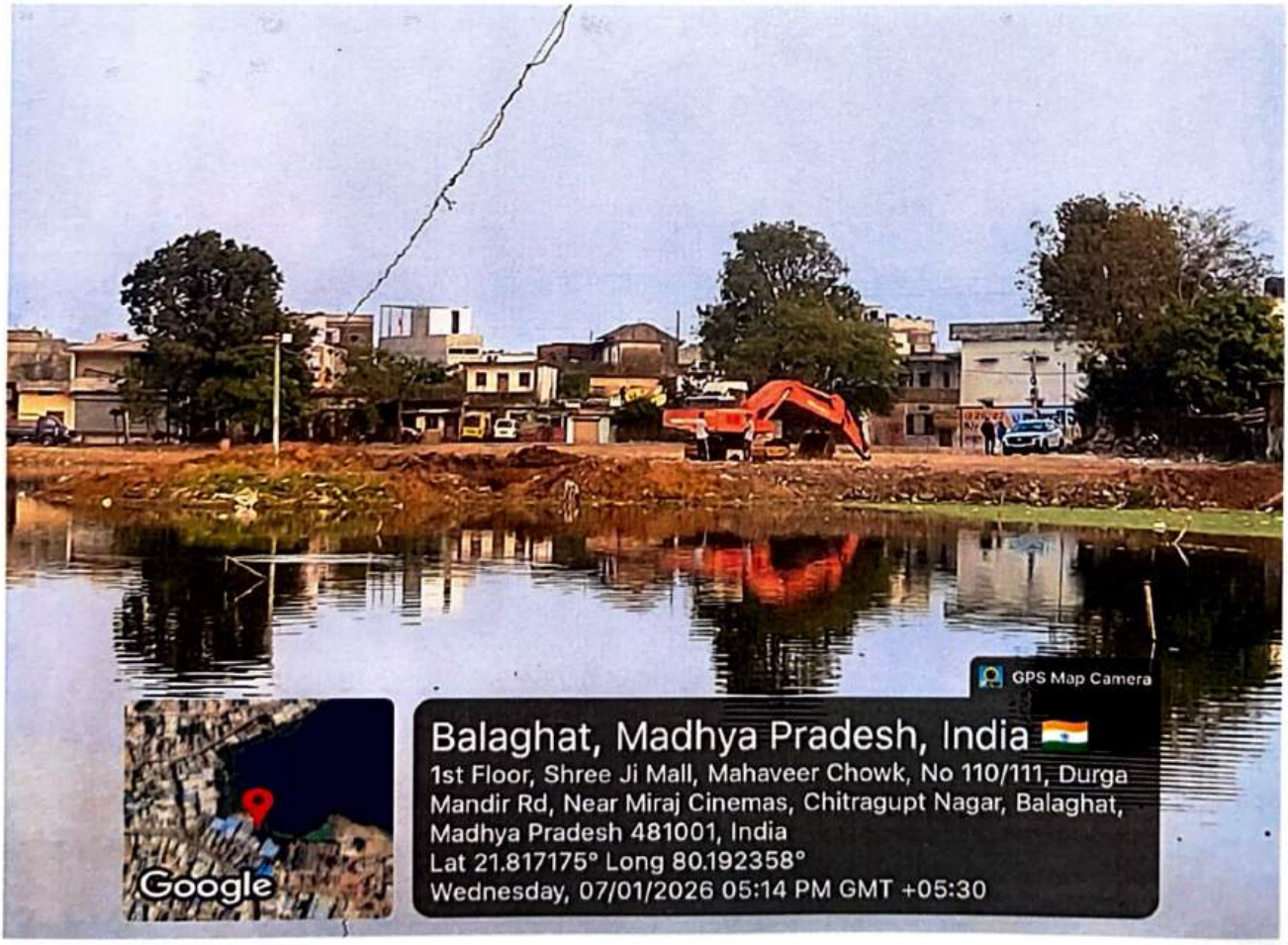
1. जिला श्रम पदाधिकारी महोदय श्रम कार्यालय बालाघाट म.प्र.।

मुख्य नगरपालिका अधिकारी
नगरपालिका परिषद बालाघाट
जिला-बालाघाट (म.प्र.)

Annexure R/4/3




GPS Map Camera
Balaghat, Madhya Pradesh, India
1st Floor, Shree Ji Mall, Mahaveer Chowk, No 110/111, Durga Mandir Rd, Near Miraj Cinemas, Chitragupt Nagar, Balaghat, Madhya Pradesh 481001, India
Lat 21.817175° Long 80.192358°
Wednesday, 07/01/2026 05:14 PM GMT +05:30
Google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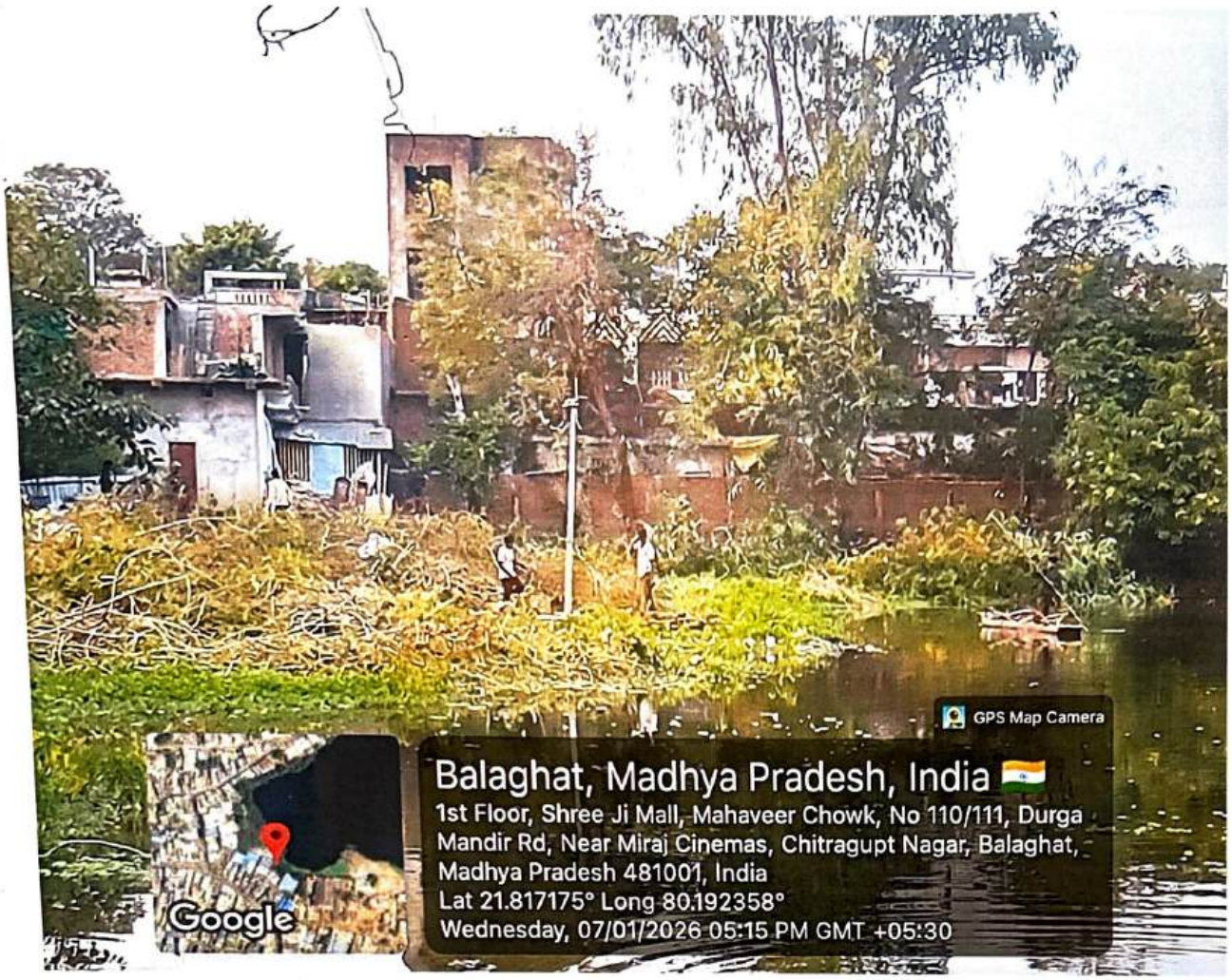
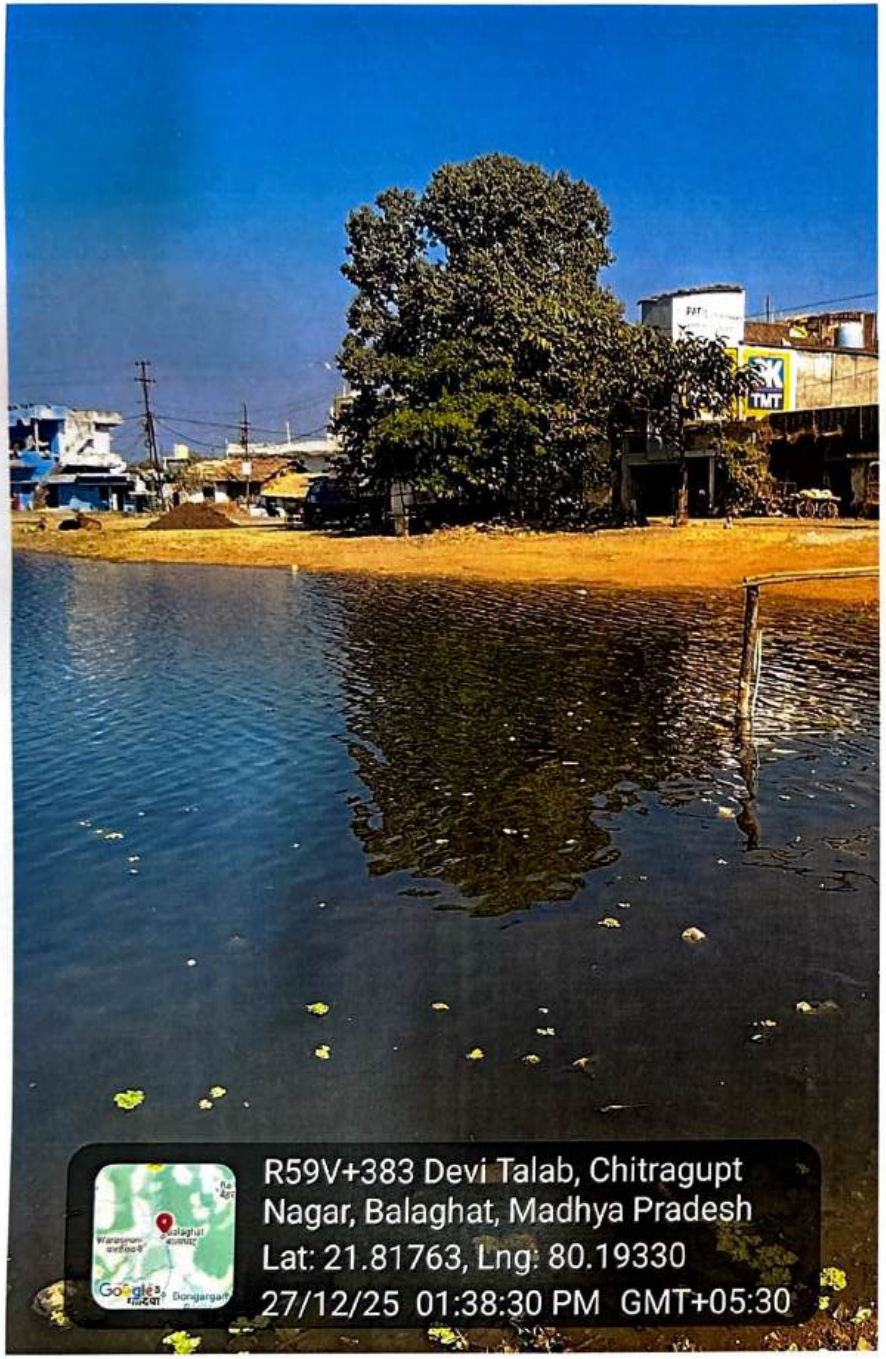
1st Floor, Shree Ji Mall, Mahaveer Chowk, No 110/111, Durga Mandir Rd, Near Miraj Cinemas, Chitragupt Nagar, Balaghat, Madhya Pradesh 481001, India
Lat 21.817175° Long 80.192358°
Wednesday, 07/01/2026 05:14 PM GMT +05:30
Google


GPS Map Camera
Balaghat, Madhya Pradesh, India
R58r+mq6, Main Rd, Chitragupt Nagar, Balaghat, Madhya Pradesh 481001, India
Lat 21.816991° Long 80.19215°
Wednesday, 07/01/2026 05:13 PM GMT +05:30
Google


GPS Map Camera
Balaghat, Madhya Pradesh, India
1st Floor, Shree Ji Mall, Mahaveer Chowk, No 110/111, Durga Mandir Rd, Near Miraj Cinemas, Chitragupt Nagar, Balaghat, Madhya Pradesh 481001, India
Lat 21.817175° Long 80.192358°
Wednesday, 07/01/2026 05:15 PM GMT +05:30
Google


GPS Map Camera
Balaghat, Madhya Pradesh, India 🇮🇳
1st Floor, Shree Ji Mall, Mahaveer Chowk, No 110/111, Durga Mandir Rd, Near Miraj Cinemas, Chitragupt Nagar, Balaghat, Madhya Pradesh 481001, India
Lat 21.817175° Long 80.192358°
Wednesday, 07/01/2026 05:15 PM GMT +05:30
Google


GPS Map Camera
Balaghat, Madhya Pradesh, India 🇮🇳
1st Floor, Shree Ji Mall, Mahaveer Chowk, No 110/111, Durga Mandir Rd, Near Miraj Cinemas, Chitragupt Nagar, Balaghat, Madhya Pradesh 481001, India
Lat 21.817175° Long 80.192358°
Wednesday, 07/01/2026 05:14 PM GMT +05:30
Google


R59V+383 Devi Talab, Chitragupt Nagar, Balaghat, Madhya Pradesh
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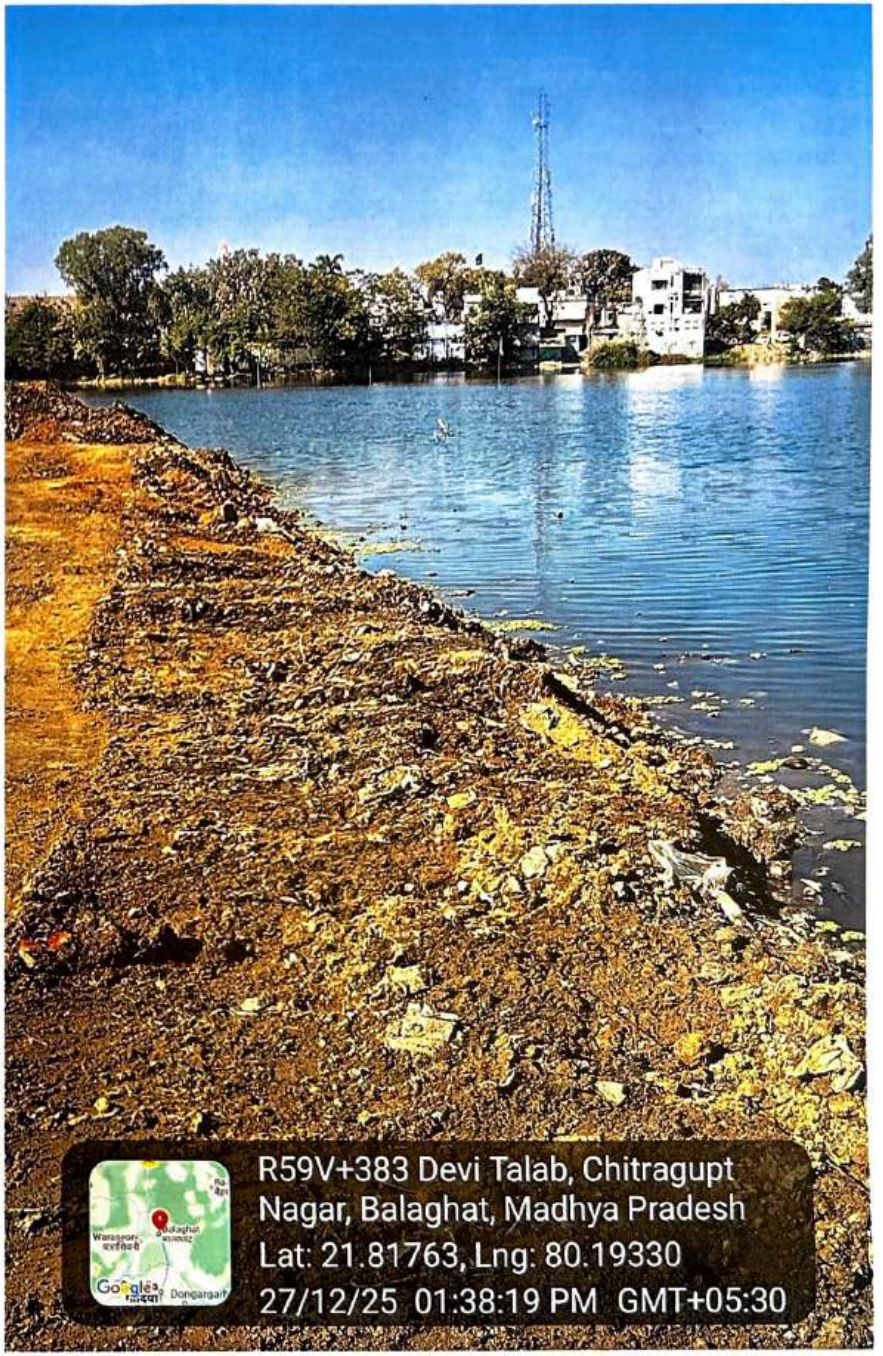
27/12/25 01:38:30 PM GMT+05:30


R59V+383 Devi Talab, Chitragupt Nagar, Balaghat, Madhya Pradesh
Lat: 21.81763, Lng: 80.19330
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R59V+383 Devi Talab, Chitragupt Nagar, Balaghat, Madhya Pradesh
Lat: 21.81763, Lng: 80.19330
27/12/25 01:38:39 PM GMT+05:30

R59V+383 Devi Talab, Chitragupt Nagar, Balaghat, Madhya Pradesh
Lat: 21.81763, Lng: 80.19330
27/12/25 01:38:43 PM GMT+05:30

कार्यालय नगरपालिका परिषद बालाघाट, जिला बालाघाट (म.प्र) 481001
852
दूरभाष क्रमांक 07632 – 241318 / 247101 ईमेल cmobalaghat@mpurban.gov.in

क्र/एफ./सा.प्र./न्याया.शाखा/2026/ 1260 बालाघाट, दिनांक 08/01/2026

प्रति,

अनुविभागीय अधिकारी (राज.),
बालाघाट जिला – बालाघाट (म.प्र.)

विषय :- माननीय राष्ट्रीय हरित अधिकरण सेन्ट्रल जोन भोपाल द्वारा प्रकरण क्रमांक OA 130 (CZ) द्वारकानाथ चौधरी विरुद्ध मध्य प्रदेश शासन व अन्य में पारित आदेश दिनांक 10.11.2025 का पालन किया जाने बाबद

विषयान्तर्गत माननीय राष्ट्रीय हरित अधिकरण सेन्ट्रल जोन भोपाल द्वारा प्रकरण क्रमांक OA 130 (CZ) द्वारकानाथ चौधरी विरुद्ध मध्य प्रदेश शासन व अन्य में पारित आदेश दिनांक 10.11.2025 के पालन में नगरपालिका परिषद बालाघाट के द्वारा देवी तालाब में साफ-सफाई का कार्य निरंतर किया जा रहा है किन्तु तालाब की कुछ भूमि पर मिट्टी-मुरुम का भराव है जिसके कारण तालाब का जलीय क्षेत्र प्रभावित हो रहा है। माननीय अधिकरण द्वारा पारित आदेश के परिपालन में देवी तालाब की भूमि पर मिट्टी-मुरुम के भराव को हटाया जाना प्रस्तावित है। देवी तालाब की भूमि से मिट्टी-मुरुम के भराव को हटाने के लिए नगरपालिका परिषद द्वारा विधिवत टेंडर प्रकिया पूर्ण कर ली गई है एवं उक्त मिट्टी-मुरुम के भराव को नगरपालिका निधि एवं जनभागीदारी से हटाने के लिए आपके मार्गदर्शन की आवश्यकता है।

अतः माननीय अधिकरण के आदेश के पालन में देवी तालाब की भूमि से मिट्टी-मुरुम के भराव को नगरपालिका निधि एवं जनभागीदारी से हटाने के लिए आवश्यक मार्गदर्शन प्रदान करने का कष्ट करे।

मुख्य नगरपालिका अधिकारी
नगरपालिका परिषद बालाघाट
जिला – बालाघाट (म.प्र.) 481001
जिला बालाघाट

प्र.क्र/एफ./सा.प्र./न्याया.शाखा/2026/ 1261 बालाघाट, दिनांक 08/01/2026

प्रतिलिपि :-

1. रजिस्ट्रार राष्ट्रीय हरित न्यायाधिकरण सेन्ट्रल जोन भोपाल की ओर सूचनार्थ।
2. प्रमुख सचिव, म.प्र. एवं विकास विभाग भोपाल को माननीय न्यायाधिकरण भोपाल के प्रकरण क्र. 130/2025(CZ) में दिनांक 10.11.2025 में पारित आदेश के पालन में सूचनार्थ।
3. आयुक्त महोदय, नगरीय प्रशासन एवं विकास विभाग संचालनालय भोपाल की ओर सूचनार्थ।
4. कलेक्टर बालाघाट को सूचनार्थ।
5. म.प्र. प्रदुषण नियंत्रण बोर्ड भोपाल को माननीय न्यायाधिकरण भोपाल के प्रकरण क्रमांक 130/2025(CZ) में दिनांक 10.11.2025 में पारित आदेश के पालन में सूचनार्थ।
6. संयुक्त संचालक, नगरीय प्रशासन एवं विकास जबलपुर संभाग जबलपुर की ओर सूचनार्थ।
7. क्षेत्रीय अधिकारी प्रदुषण नियंत्रण बोर्ड जबलपुर की ओर सूचनार्थ।
8. परियोजना अधिकारी, जिला शहरी विकास अभिकरण बालाघाट जिला बालाघाट की ओर सूचनार्थ।
9. तहसीलदार बालाघाट की ओर सूचनार्थ।

कलेक्टर कार्यालय आवक शाखा 8/1/26 बालाघाट (म.प्र.)

जिला शहरी विकास अभिकरण बालाघाट

08/01/2026

मुख्य नगरपालिका अधिकारी
नगरपालिका परिषद बालाघाट
जिला – बालाघाट (म.प्र.) 481001
जिला बालाघाट