Ratnanagar Municipality

Office of the Municipal Executive

Ratnanagar, Chitawan

Bagmati Province, Nepal

Final Report

Engineering Survey and Detail Assessment of Existing Facility of Wastewater Treatment Plant in Ratnanagar Municipality in Chitwan for Rehabilitation and Bringing the System back into Operational Condition

Submitted By:

DEVELOPMENT RESOURCES AND MANAGEMENT CONSULTANCY PVT LTD.

KATHMANDU, NEPAL

June 18, 2021 (4th Ashadh, 2078 BS)

Acknowledgement

This report includes detail information and expert recommendations on the basis of field surveys and consultations on the Wastewater Treatment Plant (WWTP) of Ratnanagar Municipality. This particular assignment focuses on the part of WWTP located on the left bank of Budhi Kulo in Ward No. 4 of the Municipality. This report contains mostly the list of activities and physical works for complete rehabilitation that are necessary before commissioning of the plant for full operation.

We are grateful to the Municipality for trusting us to undertake this assignment within a short time frame. We are indebted to the Municipality's Elected Members (Ward Chair No. 4), Senior Staff (Executive Officer, Administration, Engineers) and other concerned staffs as well. We highly appreciate the support extended by the field staff of Municipality who guided us to the field and facilitated to undertake the much-needed technical inspections and measurements in the course of this important assignment.

Table of Contents

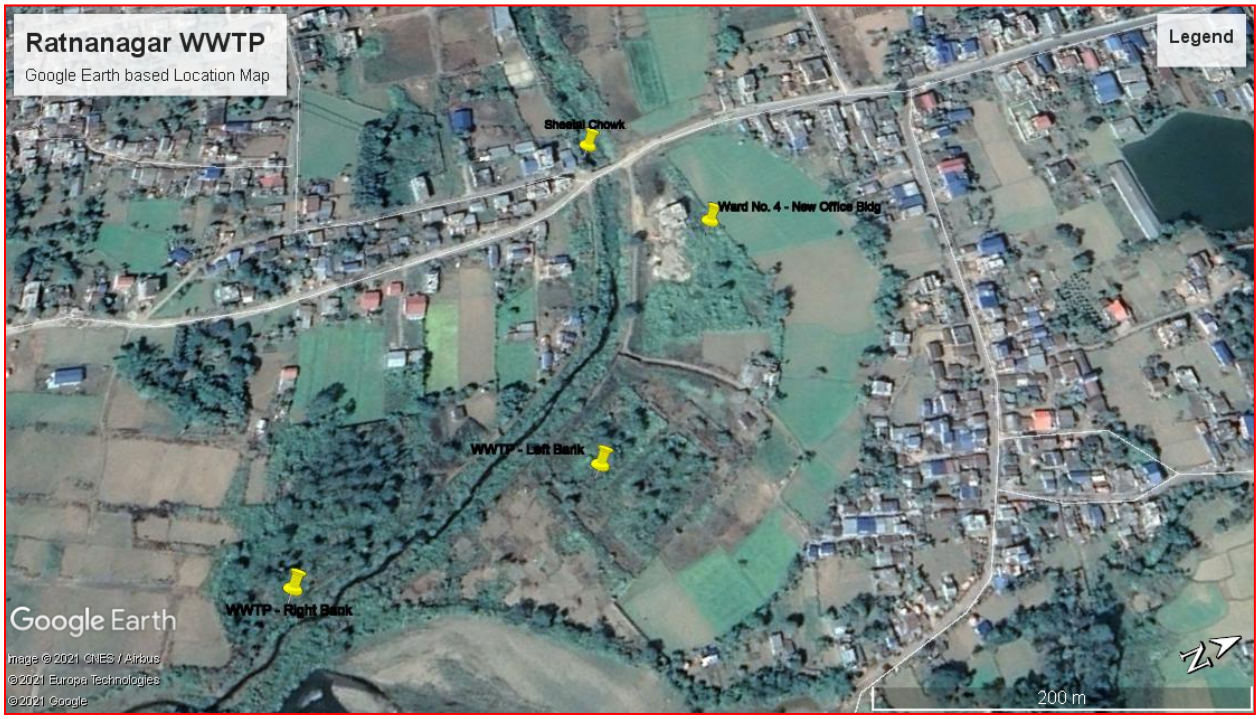
Salient Features of the WWTP (Left Bank) Rehabilitation Project

SN	Particulars	Description
1	Name of Project	Repair and Rehabilitation of Wastewater Treatment Plant with Septic Tanks and Reed Bed ponds
2	Location	Ratnanagar Municipality, Ward No. 4, Near Sheetal Chowk and Ward No. 4 new Office building
3	Project's service coverage features	Highway Junction and PuranoTandi Bazaar of Ratnanagar Municipality, Chitwan District, maximum flows = 57 L/s, RCC Hume pipe size = 400 mm dia
4	Client / Owner of the Project	Ratnanagar Municipality, Bagmati province, Chitwan
5	Base year of the survey and inspection of the WWTP components	FY 2077 /078 (April - May 2021)
6	Project implementation period	1-2 years (from FY 2078/079 – to 2079/080)
7	Existing major physical components identified and selected for minor repair and cleaning	• Sewer Pipeline RCC 400 mm dia. from SMHL 24 to existing sump well (collection chamber); • 2 Septic tanks (anaerobic baffled reactors) • 10 Reed bed ponds and associated distribution pipes (inlet and outlets) • 2 sand drying beds (SDBs) • 22 control and inspection chambers • 1 Outfall control valve (repair/replace)
8	Identified major physical components for new components	• 1 new Diversion chamber d/s of SMHL 24 • 1 new Overflow chamber d/s of Diversion chamber • 1 new sump well u/s of existing sump well and two pumping pipe lines • 2 pumps in the sump well • Extension of electrification works for lighting and new pumps operation • 1 Store room • 1 Compost chamber with shed and working platform • Landscaping for environmental safeguards and aesthetic purposes
9	Total capital cost of the rehabilitation	**NRs. 7,980,248.79**

Engineering Survey and Detail Assessment of Existing Facility of Wastewater Treatment Plant (Left Bank of *Budhi Kulo*) in Ratnanagar Municipality in Chitwan for Rehabilitation and Bringing the System back into Operational Condition

I. Introduction:

Wastewater management systems are designed to collect and treat the wastewater generated at the sources in a systematic manner so that the treated effluent can be disposed off safely or reclaimed for economic purposes. The initial investment of the wastewater collection and treatment facilities require huge amount of resources. The investment will only be justified through the sustainable management and disposal of the wastewater by operating the treatment plan in its full capacity. The case of Ratnanagar Municipality's wastewater treatment system is that it was constructed some 1 decade back and there were some damages incurred due to fire in the dried-up reed-bed system and physical destruction of different civil structures due to other reasons. The photo below captured from Google Earth Map shows the locations of the WWTP parts on the left and right banks.



Hence, as per the ToR, the Municipality intends to invest in rehabilitation of the wastewater treatment plant so that it could be brought into operation at the earliest possible time frame. Currently, the municipality's target is to rehabilitate one of its treatment plants out of the two systems which exist in the same locality separated by lowland which functions like a stream (*BudhiKulo*). The Municipality has this proactive plan to start the rehabilitation measures (hardware components) and see how it works during the operation phase. Then obviously the

Municipality may invest for rehabilitation of another wastewater treatment plant after successful commissioning of the plant that has been investigated and assessed under this assignment.

This document is intended to serve as the Draft Final Report submitted to Ratnanagar Municipality after detail investigation and assessment of one of the treatment plants. The assessment has been carried out through mobilization of relevant high skilled and qualified expertise required for undertaking the tasks in a planned manner. This report contains all the data and information on one of the wastewater treatment plant (on left bank / Eastern side of the stream - *BudhiKulo*) in order to achieve the specific objectives for preparation of the detail design and estimate reports of the expected rehabilitation. The Eastern part of the WWTP is expected to serve the sewer catchment area including Tandi Bazar. Another part of the WWTP (i.e. Western side/Right bank of *BudhiKulo*) is not included within the scope of this assignment. However, it is expected that this report will also help to indicate the nature and scope of rehabilitation works that may be required for that part as well. Once the Eastern Part of WWTP will be rehabilitated, the Municipality can at least start the WWTP operation, though partially. Through this investigation, rehabilitation and commissioning process, the municipal officials will also get practical know-how about rehabilitation works for the Western side and how to operate another part effectively that will be remained after completion of the WWTP located in the Eastern part or on the Left bank side of the stream.

II. Objectives:

The general objective of this consulting service assignment was to facilitate the Municipality for estimating the works for complete reinstatement of the technological components (pipes, chambers, filter media etc.) through detail engineering assessment and field inspections with necessary measurements. The purpose was to prepare detail report with necessary activities (mainly - hardware and some software) of the rehabilitation so that the one of the WWTP systems can be brought into operational condition as soon as possible. The Municipality Officials have indicated to conduct the investigation, assessment and measurement for the Eastern part of the Wastewater Treatment Plant. The Plant has several components: pumping line, sump well, anaerobic baffled reactors, horizontal flow artificial wetlands and finally the piping system for disposal of the treated effluent to the stream.

The specific objectives and scopes of this assignment were as following:

- Conduct detail review of available technical documents (drawings, design/estimate reports, project completion report, and other relevant information on the project's past records). These may be project documents and technical records pertaining to the construction of the wastewater treatment plan.

- Conduct detail review of commissioning report, if available at the municipality which is very critical to understand the initial operational features and performance records.

- Conduct detail site measurements through inspection and investigation of the selected WWTP system (all technological components including the physical and biological parts).

- Conduct detail consultation with the Municipality personnel (concerned technical staff, Ward Chairperson, Municipality's Committees, Local Key informants, and local inhabitants having the memories and knowledge during the construction).
- Preparation of a Field Report with major findings about the physical components of the selected WWTP (Eastern part of the WWTP systems).

- Conduct environmental assessments and social /institutional consultations about the safeguard aspects of the system rehabilitation that will also be helpful for operation and maintenance.

- Propose recommendations with detail technical reports (quantity and cost estimates) and practical institutional arrangements for construction and operation of the rehabilitated WWTP of the selected system.

III. Methods and Process

The assignment was of technical nature demanding detail field inspection and assessment for checking the capacities of the treatment units of the selected WWTP system. There were also a series of consultations conducted with the Municipality officials and elected members regarding the requirement for rehabilitation and reinstatement of the WWTP as soon as possible. Following strategies and methods were adopted for this specific assignment:

- Detail stakeholder and institutional consultations (key informants, technical experts, officials, members, local inhabitants etc.).

- In-depth technical reviews of the available project documents (which were provided by the Municipality for the purpose of assignment).

- Field investigation including the recording the measurement of the WWTP components (different aspects of technological components: flows, pipe sizes, levels, locations, lengths, depths, areas, thickness filter media, etc.). The field team measured the size, volume, thickness and other features of each component of Northern part of the WWTP.

- Defined the design parameters for the calculation of the engineering components. The purpose was to complete the design and estimate of the entire physical component within the selected Northern WWTP system.

- Technical discussions were carried out on prioritization of the software activities and hardware construction works (civil works) that need to be to be implemented for complete rehabilitation of the selected WWTP infrastructure.

- Based on the field measurements and consultations, detail design and estimates were prepared for the rehabilitation / construction works and associated software components.

IV. Field Measurement Outputs:

The field measurement resulted with the data and information on the following components in the Eastern part of WWTP. Brief description of the components has also been included here.

Incoming sewer lines: These are located at the start of the WWTP site before the wastewater enters the treatment system. There are two lines coming separately towards the WWTPs located in Northern and Southern side of the stream.

Collection Tank, Pumping Station and Pumps: there is also separate pumping station for each part of WWTP. The Northern part has its pump station adjacent to the Anaerobic Baffled Reactor.

Septic Tanks/Anaerobic Baffled Reactors: Though they are called septic tanks in the original drawings, in fact they are the Anaerobic Baffled Rectors (ABRs) in terms of their function. The ABRs are the main WWTP component to treat the wastewater for reduction of TSS, BOD and COD among other several parameters. The system utilizes anaerobic bacteria to feed on the nutrients containing in the wastewater itself.

Horizontal Flow Artificial Reed-Bed (wetlands): These are a kind of secondary treatment component which uses natural treatment properties of reed bed (wetland grass). The reed grass captures and absorbs the nutrients available in wastewater remaining after it passes through the anaerobic reactors. The root zone of the reed bed is fed with the wastewater through a vertical percolation and distribution system supported by the pipes and drainage lines beneath the reed bed media comprising of sand and gravel.

Inlets, distribution pipesystems, collection pipe systems and outlets: These are in the anaerobic baffled reactors and vertical flow reed-bed systems. There are inlets and outlet pipes in the anaerobic reactors whereas the reed-bed systems have inlets, outlets, and distribution and collection systems. The distribution pipe networks are connected with the inlets and collection pipe networks are connected with the outlets.

Outfall lines: These are the final disposal systems after the wastewater passes through the vertical flow reed-bed systems. The outfall points are located in the stream.

The information collected through the site measurement is provided below in tabular form for future technical reference (Table # 1).

Table # 1: General Description of physical features and their functionality status

SN	Component	General description of physical features, location and measurement details	Present condition (physical and functionality)
1	Incoming sewer lines, overflows system	The left bank sewer located near the bridge (at *Sheetal Chowk*) over *Budhi Kulo* is of 400 mm dia (RCC). In front of new office building of Ward No. 4 there are two structures: Diversion and Overflow (O/F) Chambers. The O/F chamber is damaged and the outlet part of the chamber is blocked. The overflow chamber is passing more than 60% of current flow of wastewater towards the stream. The general observation also proves that the sewer lines are leaking towards the steam (*Budhi Kulo*). Near that leakage point towards downstream, we can see the wastewater flowing in the stream. This also proves the leakage happening from sewers, not only from the left bank sewer, but also from right bank sewer line.	The O/F chamber is damaged and both chambers are not functioning well. Therefore, the sewer line has very little flow. In this condition, both chambers need replacement with new design features that help to control the wastewater flows as required.
2	Pumping station and pumps, rising mains	The Collection Chamber (sump well) and pumping station are within the premises of the left bank WWTP. The sump well has the following size: outer dia. = 2400 mm; clear depth = 3300 mm and RCC wall thickness = 200 mm. There is one pump currently in place which is used occasionally. From the pump, two pipes are laid towards each of septic (baffled wall) tanks No. # 1 and 2. The pipes are of DI 150 mm from collection to the septic tanks.	The originally installed three pumps are not functioning. Therefore, the municipality tried to repair them in the past. Currently, there is one pump fitted to supply through the originally laid pipes.

3	Septic Tanks or Anaerobic Baffled Reactors (ABRs)	There are two septic tanks which are designed to function as ABRs. There are 3 baffle walls and 3 shear walls that would direct flow of wastewater up and down. The outer size of each ABR is: 11360x5500x3200 mm. The wall thickness of outer /shear walls is 250 mm and that of baffle walls is 150 mm. Other dimensions match with the original drawings. From the septic tanks, the wastewater flows through outlets and then diverted towards the Horizontal Flow Reed-Bed plots. The position of septic tank outlets are intact however the outlet joints and outer walls of the septic tanks are leaking.	One of the septic tanks (No. #2) is receiving wastewater from the pumping line whereas the other is not. The pump is supplying the flow and there is a Tee junction to distribute the flow to both septic tanks. It clearly indicates that the pumping line and inlet of Septic Tank No. 1. Since there is no flow into the No. 1 tank, it is not functioning. The space between outlet pipes and walls are not grouted and currently seem leaking. Even outer wall surface is moist due to seepage from inside. Therefore both the tanks need repair to make them leak-proof.
4	Horizontal flow artificial reed-bed system (HFWL)	There are altogether 10 Reed-Bed plots with 5 plots served by each septic tank. The internal size of each plot (pond) is 22000x15000x750 mm with configuration as illustrated in the original drawings. The inlet part is 250 mm dia. HDPE pipe with 20-25 mm dia. holes to let wastewater flow onto the reed bed. After passing through the sand and gravel media, the treated wastewater ultimately reaches at outlet point via a drainage system of similar sized HDPE pipes with holes at the middle depth of the pipes. The reed-bed plants (special grass called *Narkat*) are also older than 5-10 years so they need replacement and trimming. The space around the pipes and separator walls between individual ponds are also not clean.	The reed-beds are not receiving wastewater from the inlet zones. Since the septic tanks are leaking or pipes are blocked, the wastewater has not reached the reed-beds. The reed-bed ponds are intact except some cleaning and commissioning works still due. One of the plots can be used as a pilot bed to conduct investigation during the commissioning phase.

5	Inlets, distribution system, collection system and outlets	Most of the inlet and outlet chambers of the reed-bed plots (ponds) are intact but some cover slabs are to be repaired. There are altogether 22 chambers for inlet and outlet (including drainage systems) chambers. The inlet chambers have internal size of 1000x600x950 mm with brick wall thickness of 250 mm.	Mostly cleaning is required for all chambers and inlet pipelines including the surrounding space of the chambers, pipes and separator walls between the ponds. The municipality has recently (on the last FY) replaced the inlet distribution pipes for all reed-bed ponds. Municipality staff also confirmed that similar repair and replacement has been done for another WWTP on the right bank side as well.
6	Outfall lines	There is a manhole just upstream of the outfall point which is on the left bank of *Budhi Kulo*. It houses a control valve to be operated during high floods. However the control valve is jammed due to no operation for several years. The valve should also facilitate for close monitoring and observation of the flows of treated wastewater before it is finally disposed. The size of outfall pipe is 250 mm of HDPE PN 2.5 class. The outfall structure is made of RCC and Gabion boxes towards the stream face.	The control valve needs cleaning and repair so that it functions well during the commissioning phase after rehabilitation. An alternative provision has to be made to replace if the repair of the same is not successful.
7	Sludge Drying Beds	The Sludge Drying Beds are physically intact except the top layer of filter media (sand) is degraded. Their size corresponds to the original drawings, i.e. 22000x5000 mm with 450 mm media depth (sand and gravel). There are 2 such beds separated by a brick wall of varying thickness as shown in the original drawing. The top layer of 150 mm is made of course sand supported by 2 gravel layers. Beneath the gravel layers are drainage pipes (PVC) to facilitate filtrate towards the collection chamber from which the filtrate	The top layer (sand bed 150 mm) has to be replaced by new media of course sand. Before commissioning of the WWTP, the Sludge drying bed has to be operated by pouring clean water through the bed system so that any blockages inside the drainage pipes is cleared. This is a cleaning activity. The sludge drying bed was never used due to the fact that the ABRs were not

		(leachate) is further diverted towards the reed bed inlet pipes that come from Septic Tanks No. # 1.	functioning with full capacity and sludge was not produced for further treatment.
8	Lighting system, fence, entrance and access way around and between the structures	There is no lighting system in place surrounding the reed bed ponds. The metallic entrance gate is in functional condition. The access way is also in good condition. Fencing with barbed wire is loose and the poles have to be fixed in position.	There is need to provide lighting posts within the premises of WWTP. The access way within the premises needs clearance and plantation for beatification and protection as well. The same area can also be best utilized for horticulture, herbal trees and high-value root-crops and fruits as well. In order to develop such plan, it will be worth to take advice from agricultural experts working within and beyond the Municipality. The barbed wire has to be replaced or tightened at the entrance area.
9	Any other assets and essential structures (store, guard house, electric lines, panel boards, etc	The guard quarter and store is there but with inadequate capacity. The electric line is also there but it is not extended up to the reed-bed ponds and surrounding. The electric panel board is not included in the original design.	There is no damage seen in the guard quarter but a store with adequate capacity and panel board is missing.

The measurement records corresponding to the above table have been used to prepare necessary drawings and quantity estimates for the rehabilitation works. The quantity estimates and drawings have been attached in a separate chapter.

V. Analysis of the technical measurement results and recommended measures:

The Northern part of WWTP has some critical issues including significant damages in some hardware (diversion and overflow chambers) located upstream of WWTP. A couple of years before, there were also significant damage incurred by the wildfire in the dry reed plants in many plots. The damaged HDPE pipes were rehabilitated in the last FY. Besides, there are some changes needed in other components starting from the incoming sewer lines towards the outfall point. A separate chapter will follow to discuss and conclude on recommended activities as software measures which were derived from series of consultations and requirements for implementation of the physical rehabilitation works. Below is the specific list with recommendations for the physical rehabilitation of the infrastructure (hardware parts).

The detail list mainly includes construction works and activities that should be completed prior to commissioning of the whole plant of WWTP located on the left bank of *BudhiKulo*.

1. Construction of a new diversion chamber with screens, grit trap and control gates;
   (As per drawing)

2. Construction of a new overflow chamber to regulate and divert the excess flows towards *Budhi Kulo* during wet season
   (As per drawing)

3. Cleaning of sewer line including the manholes starting from SMHL 24 (just near the bridge adjacent to *Sheetal Chowk*) to SMHL 28 (last manhole) by jetting clean water and flushing out the debris;
   (Measure lengths of pipeline to clean, length, m/person-day for cleaning including water jetting, labor and skilled labor)

4. Cleaning of existing Collection Chamber cum sump well;
   (Estimate person-day of labor and skilled labor including tools and vacuum pump with suction and delivery pipe systems)

5. Construction of a new sump well with larger capacity to hold more wastewater and facilitate longer duration of pump operation;
   (As per drawing)
6. Installation of a new pumping line from the new sump well with 2 pumps each serving to different septic tanks

(As per drawing, length of pipe, pipe cost + installation cost)

7. Cleaning of existing septic tanks (Anaerobic Baffled Reactors) and wash out of the wastewater from the tanks by vacuum pump and tanker;
   (Estimate person-day of labor and skilled labor including tools and vacuum pump with suction and delivery pipe systems)

8. Repair of inside surface of septic tanks (ABRs) to make the surface watertight and prevent the leakage from inside including from the pipe joints;
   (Estimate area of surface to repair, total area to be taken, including grouting and plastering with water resistant admixtures, skilled labor and labor including grouting machinery)

9. Cleaning of Sludge Drying Beds and replacing top layer of sand;
   (Estimate person days to clear the layer and replace by new sand, sand cost)

10. Cleaning of all the inlet and outlet pipelines and chambers before and after the Reed-bed ponds
    (Number of chambers, estimate person days/chamber including for cleaning of the distribution and exposed collection pipes, pipe lengths)

11. Clearing weeds and reed plants around the walls, pipelines and chambers for better visibility of wastewater flows during the commissioning and operation phases;
    (Estimate total length with specified width for clearance; say 2 m, across all reed plots)

12. Inside and outside repair of 10 chambers with plaster and fixing pipe joints at inlets and outlets;
    (Estimate person days required for each chamber including plastering and sealing the pipe joints)

13. Full clearing of reed plants and weeds in one of the Reed-bed ponds for inspection, regular monitoring and facilitation of the reed-bed functioning after the rehabilitation; It also includes planting the reed bed shoots as prescribed.
    (Estimate person days required for clearing of one plot and planting new shoots/roots)

14. Trimming of reed bed plants up to the level of 20 – 30 CM so that the reeds grow with new stem and fresh leaves that is a part of regular O&M of reed-bed plants;
    (Estimate person day required for trimming of 1 sqm. of reed plants, total area, and total labor, unskilled)

15. Repair of the outfall control valve and in case if repair is not possible, replace the same;
    (Estimate the control valve cost, full repair/replacement, including supply and installation)

16. Extension of electrification and lighting arrangements inside and surrounding the ponds, tanks and gate;
    (Estimate number of points for lighting installation, person days labor and skilled labor, material cost and installation costs)

17. Construction of a store house for storing of accessories, tools, keeping maintenance log-books and working tables for technical staff;
    (As per drawing)

18. Installation of a control panel board for electrical switches for pump operation and lighting; Installation of electronic level sensors for automatic switching on and off of the pumps in the new Sump Well. Fitting the sensor switches at the control panel board to be installed within the store room.
    (Estimate materials and installation costs including supply)

19. Repair of BW fence and posts;
    (Estimate material and installation costs; mostly repair/fixing the loose wires and posts)

20. Plantation and landscaping arrangements (with a separate technical support from agricultural and botanical gardening experts –it is not covered in the scope of this assignment, rather it has to be arranged by the Municipality as a separate task assigned to relevant experts);
    (We won't include this cost, let's just mention- as assumed cost, LS)

21. Construction of a compost chamber for bio-degradation of waste including for reed plants and co-composting of dried sludge retained on the drying beds;
    (As per drawing)

22. Provision of spare tools (shovels, hand-carts, trolleys, etc.), sewage/sludge suction pumps, spare pipes, manhole covers; fire-fighting accessories, etc.) for regular O&M;
    (Estimate material cost including supply and transportation)

23. Provision of additional sand stock required for replacement of top 100 mm sand layer in the sand drying beds in once-a-year frequency (for upcoming next 4 years);
    (Estimate sand rate per m3 including transportation to the site, area of sand layer, quantity of sand required)

VI. Discussion, analysis and conclusions on social and institutional aspects of rehabilitation and operation of WWTP

The WWTP on the left bank deserves not only physical rehabilitation, but also some adjustments in terms of institutional arrangements and environmental monitoring. Specifically, the activities should include the following:

1. Establish practical rules and regulations for O&M of the system; The Municipality has already a dedicated (focal) Unit that looks after environmental and sanitation matters including the O&M of the WWTP systems; the Unit should still work-out some specialized additional measures that will also cover the implementation and commissioning of the WWTP rehabilitation works and sustainable O&M. There will also be needed to work out sanitation tariff and O&M related regulations as soon as the rehabilitation work is complete. Once the commissioning is successful, there will be needed to set up the environmental monitoring system to ensure that the expected environmental outcomes from the rehabilitation works from the treatment of wastewater are also achieved.

2. The Municipality's Ward No. 4 office is very interested in rehabilitation and safe O&M of the WWTPs. Hence, detail consultations will be required within the municipality on how to best engage and mobilize the Ward's resources (HR, financial, community) to safeguard the assets and public health by constantly overseeing the O&M aspects.

3. There is high potential to improve landscaping and explore possibilities of PPP to best demonstrate and safeguard the assets by simultaneously earning financial resources through development of the space as Green- Park and leisure spot within the WWTPs. The participation and consultation with the local communities is a must in this context.

4. So far the WWTP's part located on the Right Bank of *BudhiKulo* is concerned, the Municipality can take the detail report (drawings and BOQ) carried out for the part on the left bank as the best reference and forecast the needs for additional resources for its rehabilitation. For the benefit of the Municipality, the technical and financial requirements for the Right Bank part would be mostly similar with the Left bank estimates. However, it is requested that Municipality conduct further measurements of RLs and sizes (just to verify and ensure) before the implementation of activities in order to customize the rehabilitation and design of extra components for WWTP's part located on the Right Bank.

5. The municipality also needs to have a plan for implementation to expand the existing coverage area by the sewer system upstream in the town. This will help to best utilize the WWTP assets which were designed for the design flows as mentioned in the original documents. In this context, the sewer lines should be cleansed from far upstream points down to the manholes located at the lowest points of both WWTPs. This is obviously related to the institutional and environmental frameworks of the municipality's long-term development plan. Hence, without a proper cleansing, the wastewater quantity may be far less than the designed flows.

VII. Quantity and Cost Estimates of Physical Infrastructure (Construction works) and other activities (Software parts)

(Attached)

VIII. Drawings (for further details please refer to the original design drawings of Feb 2009 which are available at the Municipality)

(Attached)

IX. Annexes

i. **Site Photographs of Existing Situation and Structures**

Site Photographs (of various parts of the WWTP)

Bill of Quantities, Rate Analysis and Cost Estimate

Office of the Municipal Executive
Ratnanagar Municipality
Chitwan, Bagmati Province, Nepal

Engineering Survey and Detail Assessment of Existing Facility of Wastewater Treatment Plant in Ratnanagar Municipality in Chitawan for Rehabilitation

Final Report

Bill of Quantities, Rate Analysis and Cost Estimate

Submitted By:
DEVELOPMENT RESOURCES AND MANAGEMENT CONSULTANCY
Kathmandu, Nepal

Office of the Municipal Executive
Ratnanagar Municipality
Chitwan, Bagmati Province, Nepal

Summary of Cost

Project:

Engineering Survey and Detail Assessment of Existing Facility of Wastewater Treatment Plant in Ratnanagar Municipality in Chitawan for Rehabilitation
F.Y.: 2077/078

S.N	Description of Works	Units	No.	Rate	Amount	Remarks
1	**GENERAL WORKS**					
1.1	Insurance of works, equipment, Contractor's workmen and employees and Third party Insurance against damage to other persons and property.	1	PS	236,870.58	236,870.58	
1.2	Carry out additional tests for material and works as required and instructed by the Engineer.	1	PS	43,000.00	43,000.00	
1.3	Provision of Labour Safety	1	PS	30,000.00	30,000.00	
1.4	Preparation of As Built Drawings	1	PS	51,637.50	51,637.50	
					361,508.08	
2	**CIVIL WORKS**					
	Store Room		1	1,359,105.88	1,359,105.88	
	Compost Pit		2	472,869.29	945,738.58	
	Sump Well		1	1,450,708.47	1,450,708.47	
	Truss compost pit		1	166,364.40	166,364.40	
	Diversion Chamber		1	158,331.82	158,331.82	
	Overflow Chamber		1	110,953.24	110,953.24	
					4,191,202.40	
3	**SANITARY WORKS**					
	All Sanitary works	Job.	1	160,735.12	160,735.12	
					160,735.12	
4	**Cleaning and MiSc. Items**					
	All works specified	Job.	1	906,926.71	906,926.71	
					906,926.71	
				Sub-Total [2+3+4]	***5,258,864.23***	
				5% Contengencies	***262,943.21***	
				10% Physical Contengencies	***525,886.42***	
				Price Adjustment 10%	***525,886.42***	
				Total	***6,935,088.37***	
				13% VAT	***683,652.35***	
				Grand Total	***7,980,248.79***	

Office of the Municipal Executive
Ratnanagar Municipality
Chitwan, Bagmati Province, Nepal

ABSTRACT OF COST FOR INSURANCE WORK

Engineering Survey and Detail Assessment of Existing Facility of Wastewater Treatment Plant in Ratnanagar Municipality in Chitawan for Rehabilitation

F.Y.: 2077/078

S.N.	Description of Work	Quantity	Unit	Rate	Amount	Remark
	INSURANCE WORKS					
1	Insurance premium for the work, plant and materials damage for contract work for all risk including Riot, Strike, Damage, Malicious damage and Terrorism for contract for 9months + 1 year maintenance.	1	job	17,180.19	17,180.19	
2	Insurance premium for the insurance of Employer's and Contractor's Staff (10 named & 10 unnamed) of NRs 1million per person for 20 persons with unlimited number of occurances per annum.	2	years	60,010.00	120,020.00	
3	Insurance premium for the construction equipments and machines with value of NRs Ten millions for 9months.	1	job	65,310.00	65,310.00	
4	Insurance premium for third party liability personal only per person NRs Five hundred thousand for 9 months.	2	years	17,180.19	34,360.38	
	Total Estimated Cost for Insurance Work				**236,870.58**	

Office of the Municipal Executive
Ratnanagar Municipality
Chitwan, Bagmati Province, Nepal

INSURANCE DETAIL

Engineering Survey and Detail Assessment of Existing Facility of Wastewater Treatment Plant in Ratnanagar Municipality in Chitawan for Rehabilitation
F.Y.: 2077/078

S.N	DESCRIPTION OF WORKS	RATE	UNIT	AMOUNT	REMARKS
1	Insurance premium for the work, plant and materials damage for contract work for all risk including Riot, Strike, Damage, Malicious damage and Terrorism for contract for 9 months + 1 year maintenance.				
	Insurance with value	5,258,864.23			
	for 1st 3 months	1.75	per thousand	9,203.01	
	for rest 18 months	0.025	per thousand	131.47	
	for terrorism	1.49	per thousand	7,835.71	
	Sub-Total (Premium)			**17,170.19**	
	for stamp duty			10.00	
	Total (Premium with stamp)			**17,180.19**	
2	Insurance premium for the insurance of Employer's and Contractor's Staff (10 named & 10 unnamed) of NRs. 1million per person for 20 persons with unlimited number of occurances per annum.				
	Insurance with value of NRs. 1000000 for 20 persons	**20,000,000.00**			
	Personnel Accident	2.5	per thousand	50,000.00	
	for terrorism	0.5	per thousand	10,000.00	
	Sub-Total (Premium)			**60,000.00**	
	for stamp duty			10.00	
	Total (Premium with stamp)			**60,010.00**	
3	Insurance premium for the construction equipments and machines with value of NRs. 20millions for 9 months.				
	Insurance with value	**20,000,000.00**			
	for 1st 3 months	1.75	per thousand	35,000.00	
	for rest 18 months	0.025	per thousand	500.00	
	for terrorism	1.49	per thousand	29,800.00	
	Sub-Total (Premium)			**65,300.00**	
	for stamp duty			10.00	
	Total (Premium with stamp)			**65,310.00**	
4	Insurance premium for third party liability personal only per person NRs. Six hundred thousand for 9 months.				
	Insurance with value of NRs. 600000 for 10	**5,258,864.23**			
	Personnel Accident	1.75	per thousand	9,203.01	
	for rest 18 months	0.025	per thousand	131.47	
	for terrorism	1.49	per thousand	7,835.71	
	Sub-Total (Premium)			**17,170.19**	
	for stamp duty			10.00	
	Total (Premium with stamp)			**17,180.19**	

Office of the Municipal Executive
Ratnanagar Municipality
Chitwan, Bagmati Province, Nepal

RATE ANALYSIS FOR PROVISIONAL SUM

Engineering Survey and Detail Assessment of Existing Facility of Wastewater Treatment Plant in Ratnanagar Municipality in Chitawan for Rehabilitation
F.Y.: 2077/078

S.N.	Description of Work	Quantity	Unit	Rate	Amount	Remark
A	**Testing of Materials**					
1	**Concrete Test**					
a	Cubes or cylinder crushing	60.00	Nos	150.00	9000.00	
2	**Brick Test**					
a	Brick Crossing Test	6.00	Nos	100.00	600.00	
b	Water Absortion Test	6.00	Nos	100.00	600.00	
c	Brick Test	6.00	Nos	300.00	1800.00	
3	**Aggregate Test**					
a	Aggregate Crushing Value Test	1.00	Nos	489.00	489.00	
b	Aggregate Impact Value	1.00	Nos	350.00	350.00	
4	**Sieve Analysis**					
a	Sieve Analysis (Wet)	1.00	Nos	844.00	844.00	
b	Sieve Analysis (Dry)	1.00	Nos	450.00	450.00	
5	**U.T.M. Tensile Strength Test**		Nos			
a	8mm Ø	1.00	Nos	3600.00	3600.00	
b	10mm Ø	1.00	Nos	3600.00	3600.00	
c	12mm Ø	1.00	Nos	3600.00	3600.00	
d	16mm Ø	1.00	Nos	3600.00	3600.00	
e	20mm Ø	1.00	Nos	4500.00	4500.00	
f	25 / 28 / 32 mm Ø	1.00	Nos	4500.00	4500.00	
6	**Cement Test**					
a	Cement mortar cube Crushing 3 Nos.	6.00	Nos	450.00	2700.00	
b	Intial setting & Final Setting	6.00	Nos	500.00	3000.00	
					43233.00	
				Say	**43000.00**	
B	**Preparation for As Built Drawings**					
1	Architect	10.000	MD	1000.00	10000.00	
2	Civil Engineer	10.000	MD	1000.00	10000.00	
3	Sanitary Engineer	5.000	MD	1000.00	5000.00	
4	Electrical Engineer	5.000	MD	1000.00	5000.00	
5	Helper	15.000	MD	550.00	8250.00	
i	Sub-total				**38250.00**	
ii	Field incentives, medical etc. @ 25% of sub- total				9562.50	
iii	Total (i+ii)				**47812.50**	
iv	Stationary, Transport, logistics etc. @ 10% of iii.				3825.00	
	Total				**51637.50**	

Office of the Municipal Executive
Ratnanagar Municipality
Chitwan, Bagmati Province, Nepal

FY 2077/78

Name of Work**: Cleaning and Miscellaneous Items for Rehabilitation of WWTP**

(for the part of WWTP located on the Left Bank of Budhi Kulo, near new office building of Ward No. 4)

S. No.	Description of Works	No	L (m)	B(m)	H(m)	D(m)	Q	Unit	Unit Rate	Total Amount (NPR)	Remarks
1	Making a temporary provision for safe diversion of wastewater near SMHL 24 towards Budhi Kulo until the WWTP rehabilitation work is complete (including backfill / demolish the temporary diversion channel and bring back the ground to original condition)	1					1.00	Job	3000.00	**3,000.00**	2 person-day +50% for tools and accessories
2	Cleaning of sewer line including the manholes starting from SMHL - 24 to the existing Sump Well (Collection Chamber) located d/s of SMHL - 28 by jetting clean water and flushing out the debris and cleansing all the internal surafce clogged due to sludge, garbage, silt, oil/greese, etc..										
	(Cleaning length from SMHL - 24 to the existing Sump Well)	1	190.23				**190.23**	**RM**	2853.45	**2,853.45**	1 person-day for 100 RM +50% for tools and accessories
3	Cleaning of existing Sump Well and rising pipes (using various tools and accessories including suction pump and delivery pipe systems and safe discharge of flushed wastewater/sludge)	1					1.00	job	6000.00	**6,000.00**	3 person-days + 100% for tools, equipments and accessories
4	Cleaning of existing 2 septic tanks / Anaerobic Baffled Reactors (ABRs) and wash out of the wastewater from the tanks by vacuum pump and tanker and dispose safely	1					1.00	LS	8000.00	**8,000.00**	4 person-days + 100% for tools, equipments and accessories
5	Repair of inside floor and wall surface of both ABRs and make the surface watertight to prevent leakage of wastewater from the tanks and around all the pipe joints at inlet, outlet, O/F and W/O.										
	Area of surface to repair by plastering with water resistant admixures and grouting into the pipe joints, as necessary	2	35.00		3.20		224.00	sqm			Vertical Walls
		2	11.70	5.80			135.72	sqm			Floors
		2					**359.72**	**sqm**	57.50	**41,367.80**	

6	Cleaning of both Sludge Drying Beds and replacing top 150 mm thick layer of sand media	2	22.00	5.00		0.15	16.50	cum	3067.00	**101,211.00**	
7	Internal cleaning of all the inlet and outlet chambers of 10 Reed Bed plots including the distribution (perforated) and drainage pipelines exposed to the surface										
	Number of inlet and outlet chambers (of 10 Reed Bed plots)	22						Nos.	6000.00	**6,000.00**	4 person-days + 50% for tools and accessories
8	Clearing weeds and reed plants around the walls, pipes, and chambers for better visibility of wastewater flow (it will be required for inspection during the commissioning phase)	1						**sqm**	6000.00	**6,000.00**	1.0 m width assumed; rate = 1 person-day per 100 sqm
9	Inside and outside repair of 10 chambers (u/s and d/s of the Reed bed plots) and sealing / fixing pipe joints at inlets and outlets to prevent the leakage	10					10.00	Nos.	500.00	**5,000.00**	0.25 person-day per chamber + 100% for materials and tools
10	Complete clearance of 1 Reed Bed plot from the reed plants and weeds including replacement of top 150 mm thick sand media layer and replanting new reed shoots and roots (to facilitate full inspection of functioning and impacts of rehabilitation on growth of reed plants and monitoring of quality of the effluent from the plot)	1	22.00	15.00			**330.00**	**sqm**	4125.00	**4,125.00**	1 person day for 100 sqm for clearing; add sand cost
		1	22.00	15.00		0.15	**49.50**	**cum**	2967.00	**146,866.50**	Sand Bed Replacement
11	Trimming of reed plants up to the height of 20-30 cm in 9 Reed Bed plots (excluded 1 plot as per item No. 9) and placing / transporting the trimmed reeds to a safe place	9	22.00	15.00			**330.00**	**sqm**	825.00	**7,425.00**	1 person day for 400 sqm(including tools and accessories)
12	Full repair or replace of the Outfall Control Valve (including supply and installation at the site)	1					1.00	Nos.	15000.00	**15,000.00**	Price of 1 valve and installation charge
13	Extension of existing electrification and lighting arrangements inside the WWTP facility for enhanced visibility, safety and night-time supervision of the facility	1					1.00	Job	100000.00	**100,000.00**	10 lighting points + 300 m electric wiring extension (by complying to safety rules)
14	Supply and installation of an electrical control panel board for electrical switches for pump operation and lighting (including installation of electronic sensors for automatic switch on-off system for the pump operation in new Sump Well; fitting the sensor - controlled switches at the panel board to be installed within the store room for ease and safety of operation)	1					1.00	Job	50000.00	**50,000.00**	LS = Rs. 50,000/-

15	Repair of barbed Wire fence and posts (including tighting the wires, replacing rust wires, fixing the posts, etc.)	1	370.52				370.52	RM	30.00	**11,115.60**	1 person day = 50 RM + 50 % for materials, tools and accessories
16	Supply and delivery of spare tools (shovels, hand-carts, trolleys, reed cutter/trimmer, etc.), a sewage/sludge suction pump, suction and delivery pipes, spare HDPE 250 mm dia (PN3) distribution and drainage pipes, RCC Hume pipe 400 mm dia (NP3), manhole covers, fire-fighting accessories, etc.	1					1.00	LS	125000.00	**125,000.00**	Items to be decided by the Municipality during implementation phase based on current stock
17	Supply and provision of additional stock of sand media required for replacement of top 150 mm layer in other any 2 reed bed plots (spare stock required for next 2-3 years to maintain smooth functioning of WWTP through reed beds	2	22.00	15.00	0.15		**99.00**	**cum**	2201.64	**217,962.36**	Adopted for only two plots out of the nine plots
18	Plantation and landscapping arrangements (on the road slopes, open space between the plots) with gardening and horticulture intiative (to be outsourced after completion of the physical rehabilitation of WWTP)	1					1.00	LS	50000.00	**50,000.00**	Municipality will decide about this item with detail scoping after completion of all the physical rehab works
	Sub total									**906,926.71**	

Office of the Municipal Executive
Ratnanagar Municipality
Chitwan, Bagmati Province, Nepal

Detail Quantity Estimate of Store Room

Project:
Engineering Survey and Detail Assessment of Existing Facility of Wastewater Treatment Plant in Ratnanagar Municipality in Chitawan for Rehabilitation
F.Y.: 2077/078

S.N	Description of works	Units	No.	Length (m)	Breadth (m)	Height (m)	Quantity	Rate	Amount	Remarks
	SECONDARY BLOCK									
A.	**CIVIL WORKS**									
1	EARTHWORKS									
1.1	Earthwork in excavation									
	Earth Work in excavation in foundation, etc. including dressing of sides lift up and stacking of excavated materials beyond 1.00mtr. clear from the edge of excavation within a lead of 80.00 mtr. and filling the foundation trench (back filling upto OGL) in layers of 15 cm. including watering, ramming, consolidation and dressing, including sidewall protection and dewatering work all complete.	***cum.***					***19.37***	***563.50***	***10,914.63***	
	For strip Footing									
	Long walll		2	8.35	0.80	0.95	12.70			
	Short wall		2	4.39	0.80	0.95	6.67			
2	PCC WORKS									
	Providing and laying machine mixed Plain Cement Concrete (PCC) with 20mm down aggregate including the necessary side shuttering, mechanical mixing, mechanical compaction, levelling, curing etc, all complete in proper line and lebel as per drawings, specifications and instructions.									
2.1	***PCC Nominal Mix (1:2:4)- M15 (100mm thick at base of foundation)***	***cum.***					***2.04***	***10668.15***	***21,751.07***	
	Long wall		2	8.35	0.80	0.10	1.34			
	Short wall		2	4.39	0.80	0.10	0.70			
2.2	***PCC Nominal Mix (1:2:4)- M15 (75mm thick PCC at Plinth Level)***	***cum.***					***2.60***	***10668.15***	***27,720.55***	
	Ground Floor		1	7.89	4.39	0.08	2.60			
3	RCC WORKS									
	Providing and laying machine mixed/machine vibrated Plain Cement Concrete in columns, beams, footings, slabs, lintels, sill, staircase, etc,including necessary ramming, leveling, curing, preliminary trial test, works test, etc, excluding the cost of reinforcement and formwork as per drawings, specifications and instructions. (cost of concrete pump and required admixtures to be added in the rate)									
3.1	***M20- Nominal Mix (1:1.5:3)***	***cum.***					***8.73***	***13411.96***	***117,060.31***	
A	**PLINTH WORKS**									
	Band		2	8.35	0.23	0.10	0.38			
			2	4.39	0.23	0.10	0.20			
B	**LINTEL WORKS**									
	Band		2	8.35	0.23	0.15	0.58			
			2	4.39	0.23	0.15	0.30			
C	**SILL WORKS**									
	Band		2	8.35	0.23	0.10	0.38			
			2	4.39	0.23	0.10	0.20			

D	**ROOF WORKS**									
	Band		2	8.35	0.23	0.18	0.67			
			2	4.39	0.23	0.18	0.35			
	slab		1	8.35	4.85	0.13	5.06			
E	**STITCH WORKS**									
	Band		2	8.35	0.23	0.10	0.38			
			2	4.39	0.23	0.10	0.20			
3.2	***Providing and fixing in position Fe500 steel reinforcement in R.C.C. works including straightening, cutting, bending, binding with 20 SWG annealed wire for tying the reinforcement of all sizes of bars at each junctions including all waste and cut pieces, placing in position with cover block of cement mortar(1:1),fixing of chair, spacers to keep the bars in intended position at all levels as per drawings, specification and instruction (Lapping, Chairs & Spacers will be provided according to joint measurement at site)***	***kg.***					***1370.30***	***120.41***	***164,999.44***	
3.3	***Providing, fabricating, erecting, centering and shuttering with laminated shuttering plywood formwork in column, slabs, beams, shear walls, sill/lintel bands, stairs etc, in perfect line and level including bracing, proping, de-shuttering at all levels and heights all complete as per drawings, specifications and instructions.***	***sqm.***					***56.44***	***1371.88***	***77,423.44***	
A	**PLINTH WORKS**									
	Band		2	8.35		0.10	1.67			
			2	4.39		0.10	0.88			
B	**LINTEL WORKS**									
	Band		2	8.35		0.15	2.51			
			2	4.39		0.15	1.32			
C	**SILL WORKS**									
	Band		2	8.35		0.10	1.67			
			2	4.39		0.10	0.88			
D	**ROOF WORKS**									
	Band		2	8.35		0.18	2.92			
			2	4.39		0.18	1.54			
	slab		1	8.35	4.85		40.51			
E	**STITCH WORKS**									
	Band		2	8.35		0.10	1.67			
			2	4.39		0.10	0.88			
4	BRICK WORKS									
4.1	Brick soling									
	Supply and laying brick soling including filling of sand inside the joints all complete as per instruction of Engineer, drawings and specification	***cum.***					***55.03***	***1027.99***	***56,574.83***	
	Strip footing		2	8.35	0.80		13.36			
			2	4.39	0.80		7.03			
	Ground Floor		1	Area	7.89	4.39	34.65			
4.2	Brick masonry work									
	Brick Masonry Work including full compensation for all labour, materials and other incidentals required to complete the work as per the specifications and drawings. It includes full compensation for using specially dressed stones on the face of walls with batter and makes provision for weep holes as necessary.									

4.2.1	***Masonry in 1:4 cement sand mortar***	***cum.***					***25.31***	***14653.53***	***370,893.40***	
	Strip Footing									
	1st footing									
	Long wall		2	8.72	0.60	0.20	2.09			
	Short wall		2	4.02	0.60	0.20	0.97			
	2nd footing									
	Long wall		2	8.47	0.35	0.20	1.19			
	Short wall		2	4.27	0.35	0.20	0.60			
	3rd footing									
	Long wall		2	8.35	0.23	0.80	3.07			
	Short wall		2	4.39	0.23	0.80	1.62			
	Ground floor									
	Long wall		2	8.35	0.23	3.15	12.10			
	Short wall		2	4.39	0.23	3.15	6.36			
	Paraquet wall									
	Long wall		2	8.35	0.12	0.85	1.63			
	Short wall		2	4.39	0.12	0.85	0.86			
	Deduct									
	D1		-1.00	0.94	0.23	2.50	-0.54			
	D2		-1.00	1.77	0.23	2.50	-1.02			
	W1		-9.00	0.97	0.23	1.80	-3.62			
5	FLOOR FINISH									
5.1	Screeding works									
	Providing and laying cement concrete flooring of 38mm thickness in volumetric proportion 1:2:4 (1cement : 2sand : 4coarse aggregate 12mm and down grade) in floor all complete as per drawings, specifications and instructions.	***sqm.***					***34.64***	***529.46***	***18,338.96***	
	GF		1	7.89	Area	4.39	34.64			
5.2	Punning									
	Net Cement Punning works over the Screeding works including necessary curing all complete as per the instruction.	***sqm.***	Same as Screeding work				***34.64***	***271.36***	***9,399.23***	
6	DOORS & WINDOWS									
6.1	Aluminium Door Frame									
	Supply, delivery, fabrication and installation of aluminium door frame (3" x 5") anchored to masonry/concrete structure with appropriate mechanism, inclusive of all necessary materials and manpower with 2 coats of approved color enamel paint over wood primer as per drawings design and instructions of A/E.	***sqm.***					***6.78***	***8925.28***	***60,491.07***	
	D1		1.00	0.94		2.50	2.36			
	D2		1.00	1.77		2.50	4.42			
6.3	Aluminum Windows/ Ventillations									
	Aluminium Windows and Ventilations; frame size 100 X 50 X 1.2 thk. Titanium anodised with 1.3-1.4 mm thk powder coated 30 micron with 6 mm clear float glass including S.S mosquito wiremesh, U-Shape both side plastic gasket, steel hook locks and screw all Accessories as per drawing all complete.	***sqm.***					***15.71***	***5876.50***	***92,343.32***	
	W1		9.00	0.97		1.80	15.71			

7	PLASTERING WORKS									
7.1	Internal Plaster Works									
	Providing and applying at all levels and shape 20 mm thick cement plaster in building inside in specified cement mortar in two layers as 6 to 8 mm thick final coat with 1:6 (1 cement :6 fine sand) cement mortar over the 12 to 14 mm thick 1:6 (1 cement : 6 coarse sand) under coat in all surface at all height including mixing mortar, laying in perfect line, level and plumb and finishing in regular and even surface including all necessary single or multi-stage scaffolding, providing and fixing 200 mm wide 24 gauge GI Chicken wire mesh at junction of R.C.C. and masonry, providing and fixing G.I. corner beads (in all edges of plaster, free standing (isolated) columns, column projection), making grooves and recesses, throating, dusting, dripping, wetting, curing, protection, etc., all complete as per drawing , specification and instruction of the Engineer. [Rate shall also include for providing drips band, moulds, groove, chicken wire mesh at junction of RCC and masonry, G.I. Corner Beads, etc., to complete the works at any heights].	***sqm.***					***76.52***	***375.42***	***28,726.90***	
	Ground Floor Level									
	Long wall		2	7.89		3.15	49.71			
	Short wall		2	4.39		3.15	27.66			
	Paraquet wall									
	Long wall		2	8.35		0.85	14.20			
	Short wall		2	4.39		0.85	7.46			
	Deductions									
	D1		-1.00	0.94		2.50	-2.36			
	D2		-1.00	1.77		2.50	-4.42			
	W1		-9.00	0.97		1.80	-15.73			
7.2	External Plaster Works									
	Providing and applying at all levels and shape 20 mm thick cement plaster in building inside in specified cement mortar in two layers as 6 to 8 mm thick final coat with 1:6 (1 cement :6 fine sand) cement mortar over the 12 to 14 mm thick 1:6 (1 cement : 6 coarse sand) under coat in all surface at all height including mixing mortar, laying in perfect line, level and plumb and finishing in regular and even surface including all necessary single or multi-stage scaffolding, providing and fixing 200 mm wide 24 gauge GI Chicken wire mesh at junction of R.C.C. and masonry, providing and fixing G.I. corner beads (in all edges of plaster, free standing (isolated) columns, column projection), making grooves and recesses, throating, dusting, dripping, wetting, curing, protection, etc., all complete as per drawing , specification and instruction of the Engineer. [Rate shall also include for providing drips band, moulds, groove, chicken wire mesh at junction of RCC and masonry, G.I. Corner Beads, etc., to complete the works at any heights].	***sqm.***					***0.00***	***477.53***	***-***	
	Ground Floor Level									
	Long wall		2	7.89		3.15	49.71			
	Short wall		2	4.39		3.15	27.66			
	Paraquet wall									
	Long wall		2	8.35		0.85	14.20			
	Short wall		2	4.39		0.85	7.46			
	Deductions									
	D1		-1.00	0.94		2.50	-2.36			
	D2		-1.00	1.77		2.50	-4.42			
	W1		-9.00	0.97		1.80	-15.73			

8	PAINTING WORKS									
8.1	Emulsion Painting Works									
	Providing and applying two or more coats emulsion paints pf required shade over a coat of primer of approved manufacturer as per manufacturer's specifications to the surface of wall, ceiling, beams columns, canopies, staircase, lobbies etc., all complete as per drawings, specifications and instruction. The rates shall include for surface preparation, scaffolding etc., all complete as per the manufacturer's recommendations and as approved by the Engineer.	***sqm.***					***153.04***	***387.89***	***59,362.81***	
	Ground Floor Level									
	Long wall		4	7.89		3.15	99.41			
	Short wall		4	4.39		3.15	55.31			
	Paraquet wall									
	Long wall		4	8.35		0.85	28.40			
	Short wall		4	4.39		0.85	14.93			
	Deductions									
	D1		-2.00	0.94		2.50	-4.71			
	D2		-2.00	1.77		2.50	-8.85			
	W1		-18.00	0.97		1.80	-31.46			
9	MISCELLANEOUS WORKS									
9.1	Front Steps & Ramp to Main Entrance									
i.	Earth Work in excavation in foundation, etc. including dressing of sides lift up and stacking of excavated materials beyond 1.00mtr. clear from the edge of excavation within a lead of 80.00 mtr. and filling the foundation trench (back filling upto OGL) in layers of 15 cm. including watering, ramming, consolidation and dressing, including sidewall protection and dewatering work all complete.	cum.					**24.34**	**563.50**	**13,715.59**	
	Steps	cum.	1	44.26		0.55	24.34			
ii.	Supply and laying brick soling including filling of sand inside the joints all complete as per instruction of Engineer, drawings and specification	cum.					**44.26**	**1027.99**	**45,498.62**	
	Steps	cum.	1	44.26			44.26			
iii.	Providing and laying machine mixed Plain Cement Concrete (PCC) with 20mm down aggregate including the necessary side shuttering, mechanical mixing, mechanical compaction, levelling, curing etc, all complete in proper line and lebel as per drawings, specifications and instructions.									
	PCC Nominal Mix (1:3:6)- M10 (75mm thick at base of foundation)	cum.					**4.42**	**10668.15**	**47,153.21**	
	Steps	cum.	1	44.26		0.10	4.42			
iv.	Providing and laying 1st class brick masonry work in specified places in all heights and level including the cost of scaffolding, RCC 3" thk. band in 1:2:4 proportion at every 3'-0" high, curing, raking joints, provision for recesses, openings, toothing etc. all complete as per drawings, specifications and instructions.									
	Providing and laying chimney made first class brick work in 1:6 cement mortar in foundation.						**6.63**	**14653.53**	**97,152.90**	
	Steps	cum.	1	44.26		0.15	6.63			
									1,319,520.27	
9	Electricity Works									
9.1	Electrification cost @3% of Civil Cost								**39,585.61**	
								Total	**1,359,105.88**	

Office of the Municipal Executive
Ratnanagar Municipality
Chitwan, Bagmati Province, Nepal

TRUSS QUANTITY - METAL WORKS

S.No	DESCRIPTION	SIZE	LENGTH (m)	BREADTH (m)	Nos.	QUANTITY	UNIT	UNIT WEIGHT	TOTAL WEIGHT	REMARKS
A	**Main Block**									
1	Bottom chord	ISNB32 M	5.46		4	1.000	m	3.1	67.70	
2	Top chord	ISNB32 M	5.814		4	1.000	m	3.1	72.09	
3		ISNB32 M	1		4	1.000	m	3.1	12.40	
4		ISNB32 M	0.637		4	2.000	m	3.1	15.80	
5		ISNB32 M	0.275		4	2.000	m	3.1	6.82	
6	Purlin	ISNB32 M	26		8	1.000	m	3.1	644.80	
7	Vertical post	ISNB50 M	2.25		8	1.000	m	5.03	90.54	
							Total wt		**910.16**	

Total Cost of Truss: 166,364.40

Office of the Municipal Executive
Ratnanagar Municipality
Chitwan, Bagmati Province, Nepal

DETAIL ESTIMATE OF SUMP WELL

Engineering Survey and Detail Assessment of Existing Facility of Wastewater Treatment Plant in Ratnanagar Municipality in Chitawan for Rehabilitation

F.Y.: 2077/078

S.N	DESCRIPTION OF WORKS	No.	LENGTH (m)	BREADTH (m)	HEIGHT (m)	QUANTITY		RATE	AMOUNT	REMARKS
	Civil work									
1	Earthwork in excavation in ordinary soils upto 2m depth									
		1	4.500		4.600	73.160	cum.			
	Total					**73.16**	**cum.**	**563.50**	**41,225.57**	
2	**BRICK WORK**									
(a)	Dry brick soling on flat with first class									
	chimney bhatta brick including sand and									
	water in foundation									
		1	4.500			15.904				
						15.90	**sqm.**	**1,027.99**	**16,349.40**	
(b)	Brick masonry work with (1:6) C/S mortar									
	including proper curing all complete									
	Baffle wall	1	4.000	0.230	1.000	0.920	cum.			
						0.92	cum.	**15,068.11**	**13,862.66**	
3	**CONCRETING WORK**									
(a)	(1:3:6) P.C.C. over soling including proper									
	compaction and curing all complete									
		1	4.500		0.300	4.771	cum.			
						4.771	**cum.**	**10,668.15**	**50,900.87**	
(b)	(1:1.5:3) P.C.C. for R.C.C. work including									
	proper mixing by mixer machine, compaction									
	by vibrator machine and proper curing as per									
	instruction all complete									
	(excluding steel and including testing of cube)									
	RCC wall	1	4.5		4.75	75.545	cum.			
		1	4		4.75	-59.690	cum.			
	Covering slab	1	4.5		0.15	2.386	cum.			
	Deductions :-									
	Covering slab	1	0.4		0.25	-0.031	cum.			
		1	0.11		0.15	-0.001	cum.			
		1	0.16		0.15	-0.003	cum.			
						18.205	**cum.**	**13,411.96**	**244,164.85**	
4	**REINFORCEMENT WORK**									
	Supply, cutting, bending, placing in position as									
	per drawing and binding by plain wire of									
	reinforcement all complete									
	Total P.C.C. for R.C.C. = 37.066 @ 2.0 % x 7850 kg/M^3					**2858.187**	**Kg**	**120.41**	**344,156.48**	
5	**FORM WORK**									
	supplying and selection of material including									
	nailing, placing seperators and dismantling									
	as per instruction all complete									
	for covering slab	1	4.500			15.904	sqm.			
	for RCC wall	1	4.500		4.750	134.303	sqm.			
		1	4.000		4.750	119.381	sqm.			
						269.588	**sqm.**	**1,371.88**	**369,842.69**	
6	**PLASTERING WORK**									
(a)	12.5 mm thick (1:4) C/S plastering work									
	including proper curing all complete									
	for covering slab	1	4.000			12.566	sqm.			
	for RCC wall	1	4.500		4.750	134.303	sqm.			
		1	4.000		4.750	119.381	sqm.			
						266.25	**sqm.**	**375.42**	**99,955.51**	
(b)	3 mm thick cement punning work including									
	proper curing all complete									
	for covering slab	1	4.000			12.566	sqm.			
	for RCC wall	1	4.500		4.750	134.303	sqm.			
		1	4.000		4.750	119.381	sqm.			
						266.25	***sqm.***	**271.36**	**72,250.45**	
7	**SEWAGE PUMPS**									
	Supply and Installation of Sewage Pump (Q max = 30 LPS, H nom = 7 m, submersible, sewage /slurry type)	**2.00**						**70,000.00**	**140,000.00**	
8	**PIPE & FITTINGS**									
	Supply and Installation of Pumping Pipe Lines including fittings from New Sump Well to both Septic Tanks (160 mm Diameter HDPE Pipe)	**2.00**				**30.00**	***m***	**800.00**	**48,000.00**	
9	**SUPPLY AND INST. OF RCC HUME PIPE**									
	As per Drawings	2						**5,000.00**	**10,000.00**	**LS**
									1,450,708.47	

Office of the Municipal Executive
Ratnanagar Municipality
Chitwan, Bagmati Province, Nepal

DETAIL ESTIMATE OF OVERFLOW CHAMBER

Engineering Survey and Detail Assessment of Existing Facility of Wastewater Treatment Plant in Ratnanagar Municipality in Chitawan for Rehabilitation

F.Y.: 2077/078

S.N	DESCRIPTION OF WORKS	No.	LENGTH (m)	BREADTH (m)	HEIGHT (m)	QUANTITY		RATE	AMOUNT	REMARKS
	Civil work									
1	Earthwork in excavation in ordinary soils upto 2m depth									
		1	2.210	1.360	1.950	5.861	cum.			
	Total					**5.86**	**cum.**	**563.50**	**3,302.63**	
2	**BRICK WORK**									
(a)	Dry brick soling on flat with first class									
	chimney bhatta brick including sand and									
	water in foundation									
	For septic tank	1	2.210	1.360		3.006				
						3.01	**sqm.**	**1,027.99**	**3,089.71**	
(b)	Brick masonry work with (1:6) C/S mortar									
	including proper curing all complete									
	Long wall	2	2.210	0.230	1.500	1.525	cum.			
	Short wall	2	0.900	0.230	1.500	0.621	cum.			
		1	0.300	0.100	0.950	0.029	cum.			
	Deductions :-									
	waste pipe	3	0.400	0.230		-0.087	cum.			
						2.09	cum.	**15,068.11**	**31,457.56**	
3	**CONCRETING WORK**									
(a)	(1:3:6) P.C.C. over soling including proper									
	compaction and curing all complete									
		1	2.210	1.360	0.050	0.150	cum.			
						0.150	**cum.**	**10,668.15**	**1,603.21**	
(b)	(1:1.5:3) P.C.C. for R.C.C. work including									
	proper mixing by mixer machine, compaction									
	by vibrator machine and proper curing as per									
	instruction all complete									
	(excluding steel and including testing of cube)									
	base	1	2.21	1.36	0.3	0.902	cum.			
	Covering slab	1	2.21	1.36	0.15	0.451	cum.			
	Deductions :-									
	Covering slab	2	0.6		0.15	-0.085	cum.			
						1.268	**cum.**	**13,411.96**	**17,002.30**	
4	**REINFORCEMENT WORK**									
	Supply, cutting, bending, placing in position as									
	per drawing and binding by plain wire of									
	reinforcement all complete									
	Total for R.C.C. = 37.066 @ 2.0 % x 7850 kg/M^3					**199.028**	**Kg**	120.41	**23,965.16**	
5	**FORM WORK**									
	supplying and selection of material including									
	nailing, placing seperators and dismantling									
	as per instruction all complete									
	for covering slab	2	2.210	1.360		6.011	sqm.			
						6.011	**sqm.**	**1,371.88**	**8,246.65**	
6	**PLASTERING WORK**									
(a)	12.5 mm thick (1:4) C/S plastering work									
	including proper curing all complete									
	Inside floor	1	1.750	0.900		1.575	sqm.			
	Inside vertical wall	2	1.750		1.700	5.950	sqm.			
		2	0.900		1.700	3.060	sqm.			
		1	0.400		1.700	0.680	sqm.			
						11.27	**sqm.**	**375.42**	**4,229.10**	
(b)	3 mm thick cement punning work including									
	proper curing all complete									
	Inside floor	1	1.750	0.900		1.575	sqm.			
	Inside vertical wall	2	1.750		1.700	5.950	sqm.			
		2	0.900		1.700	3.060	sqm.			
		1	0.400		1.700	0.680	sqm.			
						11.27	***sqm.***	**271.36**	**3,056.91**	
7	**SUPPLY AND INST OF RCC HUME PIPE**									
	As per Drawings	3						**5,000.00**	**15,000.00**	**LS**
									110,953.24	

Office of the Municipal Executive
Ratnanagar Municipality
Chitwan, Bagmati Province, Nepal

DETAIL ESTIMATE OF DIVERSION CHAMBER

Engineering Survey and Detail Assessment of Existing Facility of Wastewater Treatment Plant in Ratnanagar Municipality in Chitawan for Rehabilitation

F.Y.: 2077/078

S.N	DESCRIPTION OF WORKS	No.	LENGTH (m)	BREADTH (m)	HEIGHT (m)	QUANTITY		RATE	AMOUNT	REMARKS
	Civil work									
1	Earthwork in excavation									
		1	3.860	1.508	1.950	11.351	cum.			
	Total					**11.35**	**cum.**	**563.50**	**6,396.13**	
2	**BRICK WORK**									
(a)	Dry brick soling on flat with first class									
	chimney bhatta brick including sand and									
	water in foundation									
		1	3.860	1.508		5.821				
	Total					**5.82**	**sqm.**	**1,027.99**	**5,983.78**	
(b)	Brick masonry work with (1:6) C/S mortar									
	including proper curing all complete									
	Long wall	2	3.860	0.230	1.500	2.663	cum.			
	Short wall	3	0.900	0.230	1.500	0.932	cum.			
	Total					**3.59**	cum.	**15,068.11**	**54,168.33**	
3	**CONCRETING WORK**									
(a)	(1:3:6) P.C.C. over soling including proper									
	compaction and curing all complete									
	For manhole	1	3.860	1.508	0.300	1.746	cum.			
						1.746	**cum.**	**10,668.15**	**18,629.40**	
(b)	(1:1.5:3) P.C.C. for R.C.C. work including									
	proper mixing by mixer machine, compaction									
	by vibrator machine and proper curing as per									
	instruction all complete									
	(excluding steel and including testing of cube)									
	Covering slab	1	3.905	1.508	0.15	0.883	cum.			
	Beam	1	1.508	0.1	0.15	0.023	cum.			
	Deduction									
	Manhole	3	0.6		0.15	-0.127	cum.			
						0.779	**cum.**	**13,411.96**	**10,443.84**	
4	**REINFORCEMENT WORK**									
	Supply, cutting, bending, placing in position as									
	per drawing and binding by plain wire of									
	reinforcement all complete									
	Total P.C.C. for R.C.C. = 37.066 @ 2.0 % x 7850 kg/M^3					**122.255**	**Kg**	120.41	**14,720.86**	
5	**FORM WORK**									
	supplying and selection of material including									
	nailing, placing seperators and dismantling									
	as per instruction all complete									
	for covering slab	1	3.905	1.508		5.889	sqm.			
	for beam	1	1.508	0.150		0.226	sqm.			
						6.11	sqm.			
						12.230	**sqm.**	**1,371.88**	**16,777.95**	
6	**PLASTERING WORK**									
(a)	12.5 mm thick (1:4) C/S plastering work									
	including proper curing all complete									
	Inside floor	1	3.860	1.508		5.821	sqm.			
	Inside vertical wall	2	3.860		1.700	13.124	sqm.			
		4	0.900		1.700	6.120	sqm.			
						25.06	**sqm.**	**375.42**	**9,409.85**	
(b)	3 mm thick cement punning work including									
	proper curing all complete									
	Inside floor	1	3.860	1.508		5.821	sqm.			
	Inside vertical wall	2	3.860		1.700	13.124	sqm.			
		4	0.900		1.700	6.120	sqm.			
						25.06	***sqm.***	**271.36**	**6,801.69**	
7	**SUPPLY AND INST OF RCC HUME PIPE**									
	As per Drawings	3						**5,000.00**	**15,000.00**	**LS**
									158,331.82	

Office of the Municipal Executive
Ratnanagar Municipality
Chitwan, Bagmati Province, Nepal

DETAIL ESTIMATE OF COMPOST PIT

Engineering Survey and Detail Assessment of Existing Facility of Wastewater Treatment Plant in Ratnanagar Municipality in Chitawan for Rehabilitation

F.Y.: 2077/078

S.N	DESCRIPTION OF WORKS	No.	LENGTH (m)	BREADTH (m)	HEIGHT (m)	QUANTITY		RATE	AMOUNT	REMARKS
	Civil work									
1	Earthwork in excavation									
	Compost pit	1	4.500	3.460	1.850	28.805	cum.			
	Lechatte chamber	1	1.360	1.360	2.400	4.439	cum.			
	Total					**33.24**	**cum.**	**563.50**	**18,732.73**	
2	**BRICK WORK**									
(a)	Dry brick soling on flat with first class									
	chimney bhatta brick including sand and									
	water in foundation									
	Compost pit	1	4.460	3.460		15.432				
	Lechatte chamber	1	1.360	1.360		1.850				
	Platform	1	3.460	3.460		11.972				
	Total					**17.28**	**sqm.**	**1,027.99**	**17,764.81**	
(b)	Brick masonry work with (1:6) C/S mortar									
	including proper curing all complete									
	Compost pit									
	Long wall	2	4.460	0.230	3.150	6.463	cum.			
	Short wall	2	3.000	0.230	3.150	4.347	cum.			
	Lechatte chamber									
	Long wall	2	1.360	0.230	2.600	1.627	cum.			
	Short wall	2	0.900	0.230	2.600	1.076	cum.			
	Total					**13.51**	**cum.**	**15,068.11**	**203,607.77**	
3	**CONCRETING WORK**									
(a)	(1:3:6) P.C.C. over soling including proper									
	compaction and curing all complete									
	Compost pit	1	4.460	3.460	0.300	4.629	cum.			
	Lechatte chamber	1	1.360	1.360	0.150	0.277	cum.			
	Platform	1	3.460	3.460	0.150	1.796	cum.			
						6.703	**cum.**	**10,668.15**	**71,504.97**	
(b)	(1:1.5:3) P.C.C. for R.C.C. work including									
	proper mixing by mixer machine, compaction									
	by vibrator machine and proper curing as per									
	instruction all complete									
	(excluding steel and including testing of cube)									
	Covering slab	1	1.36	1.36	0.15	0.277	cum.			
	Bands	2	4.46	0.23	0.15	0.308	cum.			
		2	3	0.23	0.15	0.207	cum.			
		4	1.13	0.23	0.15	0.156	cum.			
	Deduction									
	Manhole	1	0.6		0.15	-0.042	cum.			
						0.906	**cum.**	**13,411.96**	**12,147.32**	
4	**REINFORCEMENT WORK**									
	Supply, cutting, bending, placing in position as									
	per drawing and binding by plain wire of									
	reinforcement all complete									
	Total P.C.C. for R.C.C. = 37.066 @ 2.0 % x 7850 kg/M^3					**142.196**	**Kg**	120.41	**17,121.96**	
5	**FORM WORK**									
	supplying and selection of material including									
	nailing, placing seperators and dismantling									
	as per instruction all complete									
	Covering slab	1	1.36	1.36		1.850	sqm.			
	Bands	4	4.46	0.23		4.103	sqm.			
		4	3	0.23		2.760	sqm.			
		8	1.13	0.23		2.079	sqm.			
						10.792	**sqm.**	**1,371.88**	**14,805.35**	

6	**ROOFING WORK**									
	Supplying and Fixing CGI Sheet Roofing					**51.860**	**sqm.**	**1,322.75**	**68,597.82**	
7	**PLASTERING WORK**									
(a)	12.5 mm thick (1:4) C/S plastering work									
	including proper curing all complete									
	Compost pit									
	Long wall	2	4.460		3.150	28.098	sqm.			
	Short wall	2	3.000		3.150	18.900	sqm.			
	Lechatte chamber									
	Long wall	2	1.360		2.600	7.072	sqm.			
	Short wall	2	0.900		2.600	4.680	sqm.			
						47.00	**sqm.**	**375.42**	**17,643.98**	
(b)	3 mm thick cement punning work including									
	proper curing all complete									
	Compost pit									
	Long wall	2	4.460		3.150	28.098	sqm.			
	Short wall	2	3.000		3.150	18.900	sqm.			
	Lechatte chamber									
	Long wall	2	1.360		2.600	7.072	sqm.			
	Short wall	2	0.900		2.600	4.680	sqm.			
						58.75	***sqm.***	**271.36**	**15,942.59**	
8	**PVC VENT PIPE**									
	Supply & Installation of PVC Vent Pipe as per Drawings	1						**15,000.00**	**15,000.00**	**LS**
									472,869.29	

Office of the Municipal Executive
Ratnanagar Municipality
Chitwan, Bagmati Province, Nepal

DETAIL SANITARY WORK ESTIMATE

Engineering Survey and Detail Assessment of Existing Facility of Wastewater Treatment Plant in Ratnanagar Municipality in Chitawan for Rehabilitation
F.Y.: 2077/078

S.N	DESCRIPTION OF WORKS	No.	LENGTH (m)	BREADTH (m)	HEIGHT (m)	QUANTITY		RATE	AMOUNT	REMARKS
A.	**Sanitary Works**									
1	**Water Transfer Submersible Pumping Set**									
1.1	Electrical Water Transfer Pumping Set - 'Type - WP-1' consisting of Electrical Multi Stage Centrifugal Pump of 2.0 HP having capacity to discharge 250 Ipm of clear water at 20 metre head (including Suction + Delivery + Friction Loss of the Pipe)with NB 25 mm (1")suction & delivery pipe sizes, etc	1				1	Set	14,888.00	14888	
2	**Detacheable Rough Screen**									
2.1	Detacheable Rough Screen Set - Each set consist of 10 mm of holes which help in screening process and used in diversion and overflow chamber. Each set consist of 3 piece of set in it.	2				2	Set	30,007.67	60015.34	
3	**Pipe Line**									
3.1	Cold Water Supply Pipe Line fromChamber to outer atmosphere of the following sizes in Chlorinated Poly Vinyl Chloride (C-PVC) Pipes of SDR-11 in Copper Tube Size (CTS) as per ASTM - D 2846 of 'MARVEL' of Nepal with necessary C-PVC Pipe Fittings (in Socket joints) of SDR-11 in CTS as per ASTM - D 2846 of 'MARVEL', Nepal in C-PVC Solvent Cement (as per ASTM: 493) joints including necessary Pipe Sleeves in the walls, Brackets, Clamps, Hangers etc. of approved type also making holes, pockets, etc. in walls or floors and making good the same to the original condition, testing the pipe line with hydraulic pressure of 10 kg/sq cm, rectifying the leakage, if any, all complete as per specification and instruction.									
i.	C-PVC pipe of size 90mm	9	3.3			29.7	rm.	612.87	18202.239	
4	**Sewer Pipe Line**									
4.1	Sewer Pipe Line having High Density Poly Ethylene (HDPE) Pipes of "PANCHKANYA or Nepatop" conforming to Nepal Standard (NS:40) - Working Pressure: 4 kgf per cm² of the following sizes in Butt Welded Joints, cutting the Pipes to the required lengths, testing the pipe line by Smoke Test, rectifying the leakage, if any, all complete as per the specification and instruction									
i.	OD 110 mm (6.0 kgf/sq cm)	1	3			3	rm.	707.21	2121.63	
ii.	OD 160 mm (6.0 kgf/sq cm)	2	25.961			51.922	rm.	1,261.66	65507.91052	
							Total of Sanitary Works		160,735.12	

Analysis of Rates (Sanitary)

Office of the Municipal Executive

Ratnanagar Municipality

F.Y.: 2077/078

Description		Unit	Quantity	U.Rate	Amount
Item: Supplying and fixing white glazed regular commode "S" trap with white glazed porcelain clay 10ltr. Cistern seat cover, (cascade type) all complete.					
Labour	Skilled	m.d.	3	1,000.00	3,000.00
	Unskilled	m.d.	3	700.00	2,100.00
Material	Porcelain clay white glazed regular commode "S" trap. (Hindustan, Parryware, Classica, Cera or equivalent)	Nos.	1	1,825.00	1,825.00
	White glazed porcelain clay 10ltr. Cistern with internal part of cistern PVC fittings	Nos.	1	3,559.00	3,559.00
	Bakelite toilet seat cover	Nos.	1	276.00	276.00
	32mm x 60cm size C.P. flushing pipe	Nos.	1	510.00	510.00
	1.5 x 45 cm (1/2" x 18") PVC pipe connector	Nos.	1	143.00	143.00
	Screw etc.	L.S			20.00
			Actual Rate		**11,433.00**
			Rate per set		**11,433.00**

Item: Supplying and fixing white glazed wash basin with piller cock, bottle trap, coupling, bracket complete set.

Labour	Skilled	m.d.	2	1,000.00	2,000.00
	Unskilled	m.d.	2	700.00	1,400.00
Material	500x400 cm Porcelain clay white glazed wash basin (Hindustan, Parryware, Classica, Cera or equivalent) regular.	Nos.	1	1,095.00	1,095.00
	C.I. Bracket	Nos.	1	378.00	378.00
	32 mm PVC bottle trap including 32mm C.P waste coupling with C.P chain and rubber plug	Nos.	1	476.00	476.00
	15mm fancy type C.P pillar cock (heavy)	Nos.	1	1,263.00	1,263.00
	1.5 x 45 cm (1/2" x 18") CP flexible pipe	Nos.	1	181.00	181.00
	Screw etc.	L.S			20.00
			Actual Rate		**6,813.00**
			Rate per set		**6,813.00**

Item: Supplying and fixing 2000 liters PVC roof water tank all complete.

Labour	Skilled	m.d.	3	1,000.00	3,000.00
	Unskilled	m.d.	4	700.00	2,800.00
Material	2000 liters PVC roof water tank with inlet, outlet, overflow, cleanout hole, etc.	Nos.	1	24,000.00	24,000.00
	Tank nipples with washout plug, etc.	LS			207.67
			Actual Rate		**30,007.67**
			Rate per set		**30,007.67**

Item: Supplying and fixing 1 H.P. electric motor pump, monoblock type (Crompton) with all complete

Labour	Skilled	m.d.	4	1,000.00	4,000.00
	Unskilled	m.d.	2	700.00	1,400.00
Material	1 H.P. electric mptor pump, monoblock type (Crompton) with base plate, nuts, bolts, etc.	Nos.	1	9,465.00	9,465.00
	Zinc oxide, screws, etc.	LS			23.00
			Actual Rate		**14,888.00**
			Rate per set		**14,888.00**

Item: Supplying and fixing C.P toilet paper holder

Labour	Skilled	m.d.	0.11	1,000.00	110.00
	Unskilled	m.d.	0	700.00	-
Material	C.P toilet paper holder	Nos.	1	510.00	510.00
	Zinc oxide, screws, etc.	LS			10.00
			Actual Rate		**630.00**
			Rate per set		**630.00**

Item: Supplying and fixing C.P soap dish

Labour	Skilled	m.d.	0.11	1,000.00	110.00
	Unskilled	m.d.	0	700.00	-
Material	C.P soap dish	Nos.	1	510.00	510.00
	Zinc oxide, screws, etc.	LS			10.00
			Actual Rate		**630.00**
			Rate per set		**630.00**

Item: Supplying and fixing C.P shower rose 7.5cm dia. with revolving type.

Labour	Skilled	m.d.	0.33	1,000.00	330.00
	Unskilled	m.d.	0	700.00	-
Material	C.P shower rose	Nos.	1	567.00	567.00
			Actual Rate		**897.00**
			Rate per set		**897.00**

Item: Supplying and fixing C.P concealed stop cock-heavy type.

Labour	Skilled	m.d.	0.11	1,000.00	110.00
	Unskilled	m.d.	0	700.00	-
Material	C.P concealed stop cock-heavy type	Nos.	1	1,331.00	1,331.00
			Actual Rate		**1,441.00**
			Rate per set		**1,441.00**

Item: Supplying and fixing C.P towel rod 20x45cm (3/4"x18")

Labour	Skilled	m.d.	0.22	1,000.00	220.00
	Unskilled	m.d.	0	700.00	-
Material	C.P towel rod 20x45cm (3/4"x18")	Nos.	1	1,578.00	1,578.00
	Zinc oxide, screws, etc.	LS			10.00
			Actual Rate		**1,808.00**
			Rate per set		**1,808.00**

Item: Supplying and fixing Bevelled edge Looking mirror 50x40 cm (20"x16") size.

Labour	Skilled	m.d.	0.333	1,000.00	333.00
	Unskilled	m.d.	0	700.00	-
Material	Bevelled edge looking mirror 20"x16" size.	Nos.	1	1,459.00	1,459.00
	Zinc oxide, screws, etc.	LS			10.00
			Actual Rate		**1,802.00**
			Rate per set		**1,802.00**

Item: Supplying and fixing 15mm C.P Bib cock (heavy)

Labour	Skilled	m.d.	0.111	1,000.00	111.00
	Unskilled	m.d.	0	700.00	-
Material	15mm C.P Bib cock (heavy)	Nos.	1	1,361.00	1,361.00
	Zinc oxide, screws, etc.	LS			10.00
			Actual Rate		**1,482.00**
			Rate per set		**1,482.00**

Item: Supplying and fixing 1/2" dia. G.M Gate Valve

Labour	Skilled	m.d.	0.111	1,000.00	111.00
	Unskilled	m.d.	0	700.00	-
Material	15mm dia. G.M gate valve	Nos.	1	881.88	881.88
			Actual Rate		**992.88**
			Rate per set		**992.88**

Item: Supplying and fixing 3/4" dia. G.M Gate Valve

Labour	Skilled	m.d.	0.111	1,000.00	111.00
	Unskilled	m.d.	0	700.00	-
Material	20mm dia. G.M gate valve	Nos.	1	1,098.25	1,098.25
			Actual Rate		**1,209.25**
			Rate per set		**1,209.25**

Item: Supplying and fixing 1" dia. G.M Gate Valve

Labour	Skilled	m.d.	0.22	1,000.00	220.00
	Unskilled	m.d.	0	700.00	-
Material	25mm dia. G.M gate valve	Nos.	1	1,768.30	1,768.30
			Actual Rate		**1,988.30**
			Rate per set		**1,988.30**

Item: Supplying and fixing 1 1/4" dia. G.M Gate Valve

Labour	Skilled	m.d.	0.22	1,000.00	220.00
	Unskilled	m.d.	0	700.00	-
Material	32mm dia. G.M gate valve	Nos.	1	2,522.89	2,522.89
			Actual Rate		**2,742.89**
			Rate per set		**2,742.89**

Item: Supplying and fixing 1 1/2" dia. G.M Gate Valve

Labour	Skilled	m.d.	0.444	1,000.00	444.00
	Unskilled	m.d.	0	700.00	-
Material	40mm dia. G.M gate valve	Nos.	1	3,177.48	3,177.48
			Actual Rate		**3,621.48**
			Rate per set		**3,621.48**

Item: Supplying and fixing 2" dia. G.M Gate Valve

Labour	Skilled	m.d.	0.444	1,000.00	444.00
	Unskilled	m.d.	0	700.00	-
Material	50mm dia. G.M gate valve	Nos.	1	5,059.42	5,059.42
			Actual Rate		**5,503.42**
			Rate per set		**5,503.42**

Item: Supplying and fixing 4" dia. G.M Gate Valve

Labour	Skilled	m.d.	0.444	1,000.00	444.00
	Unskilled	m.d.	0	700.00	-
Material	100mm dia. G.M gate valve	Nos.	1	21,301.38	21,301.38
			Actual Rate		**21,745.38**
			Rate per set		**21,745.38**

Item: Supplying and fixing 1" dia. G.M Check valve.

Labour	Skilled	m.d.	0.22	1,000.00	220.00
	Unskilled	m.d.	0	700.00	-
Material	25mm dia. G.M check vlave	Nos.	1	1,627.38	1,627.38
			Actual Rate		**1,847.38**
			Rate per set		**1,847.38**

Item: Supplying and fixing 12.5cm (5") dia. C.P grating.

Labour	Skilled	m.d.	0.056	1,000.00	56.00
	Unskilled	m.d.	0	700.00	-
Material	12.5cm (5") dia. C.P Grating	Nos.	1	62.00	62.00
			Actual Rate		**118.00**
			Rate per set		**118.00**

Item: Supplying and fixing 15mm C.P long body bib cock (heavy)

Labour	Skilled	m.d.	0.111	1,000.00	111.00
	Unskilled	m.d.	0	700.00	-
Material	15mm C.P long body bib cock (heavy)	Nos.	1	952.00	952.00
	Zinc oxide, screws, etc.	LS			10.00
			Actual Rate		**1,073.00**
			Rate per set		**1,073.00**

Item: Supplying and fixing 1/2" dia. G.I pipe (medium) with G.I fittings (tees, elbows, union, socket, etc) with jointing materials.

Labour	Skilled	m.d.	0.18	1,000.00	180.00
	Unskilled	m.d.	0.16	700.00	112.00
Material	1/2" dia. G.I pipe (medium)	rm.	1	149.17	149.17
	G.I fittings and painting	LS			30.00
	Jointing material	LS			7.00
			Actual Rate		**478.17**
			Rate per rm.		**478.17**

Item: Supplying and fixing 3/4" dia. G.I pipe (medium) with G.I fittings (tees, elbows, union, socket, etc) with jointing materials.

Labour	Skilled	m.d.	0.18	1,000.00	180.00
	Unskilled	m.d.	0.16	700.00	112.00
Material	3/4" dia. G.I pipe (medium)	rm.	1	192.00	192.00
	G.I fittings and painting	LS			30.00
	Jointing material	LS			7.00
			Actual Rate		**521.00**
			Rate per rm.		**521.00**

Item: Supplying and fixing 1" dia. G.I pipe (medium) with G.I fittings (tees, elbows, union, socket, etc) with jointing materials.

Labour	Skilled	m.d.	0.18	1,000.00	180.00
	Unskilled	m.d.	0.32	700.00	224.00
Material	1" dia. G.I pipe (medium)	rm.	1	328.33	328.33
	G.I fittings and painting	LS			40.00
	Jointing material	LS			10.00
			Actual Rate		**782.33**
			Rate per rm.		**782.33**

Item: Supplying and fixing 1 1/4" dia. G.I pipe (medium) with G.I fittings (tees, elbows, union, socket, etc) with jointing materials.

Labour	Skilled	m.d.	0.18	1,000.00	180.00
	Unskilled	m.d.	0.32	700.00	224.00
Material	1 1/4" dia. G.I pipe (medium)	rm.	1	426.67	426.67
	G.I fittings and painting	LS			45.00
	Jointing material	LS			10.00
			Actual Rate		**885.67**
			Rate per rm.		**885.67**

Item: Supplying and fixing 1 1/2" dia. G.I pipe (medium) with G.I fittings (tees, elbows, union, socket,

Labour	Skilled	m.d.	0.18	1,000.00	180.00
	Unskilled	m.d.	0.32	700.00	224.00
Material	1 1/2" dia. G.I pipe (medium)	rm.	1	490.00	490.00
	G.I fittings and painting	LS			50.00
	Jointing material	LS			12.00
			Actual Rate		**956.00**
			Rate per rm.		**956.00**

Item: Supplying and fixing 2" dia. G.I pipe (medium) with G.I fittings (tees, elbows, union, socket, etc)

Labour	Skilled	m.d.	0.18	1,000.00	180.00
	Unskilled	m.d.	0.32	700.00	224.00
Material	2" dia. G.I pipe (medium)	rm.	1	670.00	670.00
	G.I fittings and painting	LS			60.00
	Jointing material	LS			15.00
			Actual Rate		**1,149.00**
			Rate per rm.		**1,149.00**

Item: Supplying and fixing 4" dia. G.I pipe (medium) with G.I fittings (tees, elbows, union, socket, etc)

Labour	Skilled	m.d.	0.18	1,000.00	180.00
	Unskilled	m.d.	0.32	700.00	224.00
Material	4" dia. G.I pipe (medium)	rm.	1	1,573.33	1,573.33
	G.I fittings and painting	LS			75.00
	Jointing material	LS			18.00
			Actual Rate		**2,070.33**
			Rate per rm.		**2,070.33**

Item: Supplying and fixing 2 1/2" dia. 4kg/cm^2 pressure PVC pipe

Labour	Skilled	m.d.	0.167	1,000.00	167.00
	Unskilled	m.d.	0.2	700.00	140.00
Material	75mm (2 1/2") dia. 4kg/cm^2 pressure PVC pipe	rm.	1	154.25	154.25
			Actual Rate		**461.25**
			Rate per rm.		**461.25**

Item: Supplying and fixing 4" dia. 4kg/cm^2 pressure PVC special (Tee,Bends,clip etc per set)

Labour	Skilled	m.d.	0.16	1,000.00	160.00
	Unskilled	m.d.	0.2	700.00	140.00
Material	110mm (4") dia. 4kg/m^2 pressure PVC plain Tee	Nos.	1	278.76	278.76
	110mm (4") dia. 4kg/m^2 pressure PVC 45 degree bend	Nos.	1	157.96	157.96
	Pipe clip	Nos.	1	37.17	37.17
	Jointing material	LS			5.00
			Actual Rate		**778.89**
			Rate per set.		**778.89**

Item: Supplying and fixing 2 1/2" dia. 4kg/cm^2 pressure PVC special (Tee,Bends,clip etc per set)

Labour	Skilled	m.d.	0.11	1,000.00	110.00
	Unskilled	m.d.	0.1	700.00	70.00
Material	75mm (2 1/2") dia. 4kg/m^2 pressure PVC plain Tee	Nos.	1	146.81	146.81
	75mm (2 1/2") dia. 4kg/m^2 pressure PVC 45 degree bend	Nos.	1	87.96	87.96
	Pipe clip	Nos.	1	27.88	27.88
	Jointing material	LS			4.00
			Actual Rate		**446.65**
			Rate per set.		**446.65**

Item: Supplying and fixing fire extinguisher ABC stored pressure type - 4.5kg

Labour	Skilled	m.d.	1	1,000.00	1,000.00
	Unskilled	m.d.	0	700.00	-
Material	4.5kg fire extinguisher ABC stored pressure type	Nos.	1	5,040.00	5,040.00
			Actual Rate		**6,040.00**
			Rate per set.		**6,040.00**

Item: Supplying and fixing 24" dia, round C.I heavy manhole cover with square frame (70kf/set)

Labour	Skilled	m.d.	1	1,000.00	1,000.00
	Unskilled	m.d.	3	700.00	2,100.00
Material	C.I heavy manhole cover round with square frame 55cm diameter.	Set	1	10,290.00	10,290.00
			Actual Rate		**13,390.00**
			Rate per set.		**13,390.00**

Item: Supplying and fixing 4" dia. 4kg/cm^2 pressure high density polythene pipe.

Labour	Skilled	m.d.	0.167	1,000.00	167.00
	Unskilled	m.d.	0.2	700.00	140.00
Material	110mm (4") dia. 4kg/cm^2 pressure HDPE pipe	rm.	1	400.21	400.21
			Actual Rate		**707.21**
			Rate per rm.		**707.21**

Item: Supplying and fixing 4 1/2" dia. 4kg/cm^2 pressure high density polythene pipe.

Labour	Skilled	m.d.	0.167	1,000.00	167.00
	Unskilled	m.d.	0.2	700.00	140.00
Material	125mm (4 1/2") dia. 4kg/cm^2 pressure HDPE pipe	rm.	1	537.92	537.92
			Actual Rate		**844.92**
			Rate per rm.		**844.92**

Item: Supplying and fixing 5" dia. 4kg/cm^2 pressure high density polythene pipe.

Labour	Skilled	m.d.	0.2	1,000.00	200.00
	Unskilled	m.d.	0.25	700.00	175.00
Material	140mm (5") dia. 4kg/cm^2 pressure HDPE pipe	rm.	1	681.74	681.74
			Actual Rate		**1,056.74**
			Rate per rm.		**1,056.74**

Item: Supplying and fixing 6" dia. 4kg/cm^2 pressure high density polythene pipe.

Labour	Skilled	m.d.	0.2	1,000.00	200.00
	Unskilled	m.d.	0.25	700.00	175.00
Material	160mm (6") dia. 4kg/cm^2 pressure HDPE pipe	rm.	1	886.66	886.66
			Actual Rate		**1,261.66**
			Rate per rm.		**1,261.66**

Item: Supplying and fixing 7" dia. 4kg/cm^2 pressure high density polythene pipe.

Labour	Skilled	m.d.	0.333	1,000.00	333.00
	Unskilled	m.d.	0.5	700.00	350.00
Material	180mm (7") dia. 4kg/cm^2 pressure HDPE pipe	rm.	1	1,199.07	1,199.07
			Actual Rate		**1,882.07**
			Rate per rm.		**1,882.07**

Item: Supplying and fixing 8" dia. 4kg/cm^2 pressure high density polythene pipe.

Labour	Skilled	m.d.	0.5	1,000.00	500.00
	Unskilled	m.d.	0.5	700.00	350.00
Material	200mm (8") dia. 4kg/cm^2 pressure HDPE pipe	rm.	1	1,384.15	1,384.15
			Actual Rate		**2,234.15**
			Rate per rm.		**2,234.15**

Item: Supplying and fixing 11 x 7.5cm (4"x2.5") PVC multi floor trap

Labour	Skilled	m.d.	0.11	1,000.00	110.00
	Unskilled	m.d.	0.1	700.00	70.00
Material	11x7.5cm (4"x2.5") PVC multi floor trap	Nos.	1	169.06	169.06
			Actual Rate		**349.06**
			Rate per set.		**349.06**

Item: Fire Post

Labour	Skilled	m.d.	0.11	1,000.00	110.00
	Unskilled	m.d.	0.1	700.00	70.00
Material	a. Landinng valve ISI marked is : 5290, Hos	Nos.	1	27,214.00	27,214.00
	box 18 gauge mild steel, 75x60x25cm (30"x24"x10") to accommodate two hose length of 15 meters each and one branch pipes with locking arrangement, 2 lengths Jayashree RRL hose				
	(ISI is : 636 in 15 meter length with male and female coupling dully binded with wires, Branch pipe short GM.)(minimax)				
			Actual Rate		**27,394.00**
			Rate per set.		**27,394.00**

Item: Fire hose reel

Labour	Skilled	m.d.	0.11	1,000.00	110.00
	Unskilled	m.d.	0.1	700.00	70.00
Material	a. Swinging hose reel with 20 mm hydraulic rubber braided hose 30 mt. Long, swinging up to 170° nozzle, U shape reel carriel, diamension 31½" heigth over all 29" projection from wall (minimax)	Nos.	1	19,700.00	19,700.00
			Actual Rate		**19,880.00**
			Rate per set.		**19,880.00**

Item: URINAL COMPLETE SET 61x41x38 cm SIZE

Labour	Skilled	m.d.	0.11	1,000.00	110.00
	Unskilled	m.d.	0.1	700.00	70.00
Material	a.61x41x38 cm White glaze flat back Urinal (Hindustan, Parryware, Classica,cera or equi.)	Nos.	1	4,174.00	4,174.00
	b. Waste coupling 32mm	Nos.	1	446.00	446.00
	c.½" x18" Pvc pipe connector	Nos.	1	143.00	143.00
	d.screw etc.	LS			20.00
			Actual Rate		**4,963.00**
			Rate per set.		**4,963.00**

Office of the Municipal Executive
Ratnanagar Municipality
Chitwan, Bagmati Province, Nepal

Civil Rate Analysis

F.Y.: 2077/078

1 Site Clearance Works

Description	Clearing of site, uprooting, carrying and disposing of vegetation, grass, bush, sapling and trees of any girth (measured at a height of 1 m above the ground level), lead 20 m as per instruction of the site engineer all complete.

Norms **DUDBC** **A2**

Respective clauses of specification

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	0	Md	1000	-	
	Unskilled	0.022	Md	700	15.40	
				Sub Total (L)	15.40	
				Total	15.40	
				Actural Rate	15.40	0
				15% Contractor's overhead	2.31	
				Rate per sqm. (Contractor's Rate) Excluding VAT	**17.71**	
				Rate per sqm. (User's Rate) Including VAT in Material	**15.40**	

2 Earthwork in excavation

Description	Earthwork in excavation for surface preparation including removal of any raises, filling of depressions, using an excavator for excavation, haulage of extra materials from site to provided location (within 1000 meters) all complete as per drawings, specifications and instructions of A/E.

Norms **DUDBC** **B7**

Respective clauses of specification

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	0	Md	1000	-	
	Unskilled	0	Md	700	-	
				Sub Total (L)	-	
Materials	Disel	0.1248	ltr.	88	10.98	
				Sub Total (M)	10.98	
T&P	Excavator	0.0104	hrs.	2827.02	29.40	
				Sub Total (T&P)	29.40	
				Total Rate (L+M+T&P)	40.38	0
				15% Contractor's overhead	6.06	
				Rate per cum. (Contractor's Rate) Excluding VAT	**46.44**	
				Rate per cum. (User's Rate) Including VAT in Material	**40.38**	

Civil Rate Analysis

F.Y.: 2077/078

3 Earthwork in excavation

Description	Earth Work in excavation in foundation, etc. including dressing of sides lift up and stacking of excavated materials beyond 1.00mtr. clear from the edge of excavation within a lead of 80.00 mtr. and filling the foundation trench (back filling upto OGL) in layers of 15 cm. including watering, ramming, consolidation and dressing, including sidewall protection and dewatering work all complete.

Norms **DUDBC** **B1**

Respective clauses of specification

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	0	Md	1000	-	
	Unskilled	0.7	Md	700	490.00	
				Sub Total (L)	490.00	
Materials					-	
				Sub Total (M)	-	
T&P						
				Sub Total (T&P)	-	
				Total Rate (L+M+T&P)	490.00	0
				15% Contractor's overhead	73.50	
				Rate per cum. (Contractor's Rate) Excluding VAT	**563.50**	
				Rate per cum. (User's Rate) Including VAT in Material	**490.00**	

4 Earthwork backfilling

Description	Earthwork in filling in foundation, under floors and other structures in layers upto Plinth level, not exceeding 20 cm, including watering, ramming and consolidation (compaction more than 95% relative dry density) with the earth obtained from the site or brought from outside all complete as per drawings, specificaitions and instructions.

Norms **DUDBC** **B2**

Respective clauses of specification

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	0	Md	1000	-	
	Unskilled	0.5	Md	700	350.00	
				Sub Total (L)	350.00	
Materials	Earth/Soil	1.5	cum.	950	1,425.00	
				Sub Total (M)	1,425.00	
T&P						
				Sub Total (T&P)	-	
				Total Rate (L+M+T&P)	1,775.00	0
				15% Contractor's overhead	266.25	
				Rate per cum. (Contractor's Rate) Excluding VAT	**2,041.25**	
				Rate per cum. (User's Rate) Including VAT in Material	**1,775.00**	

Civil Rate Analysis

F.Y.: 2077/078

5 Sand Filling

Description: Sand filling below plinth for levelling works (quarry sand filling works)

Norms **DUDBC** **B3**

Respective clauses of specification

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	0	Md	1000	-	
	Unskilled	0.7	Md	700	490.00	
				Sub Total (L)	490.00	
Materials	Sand	1.1	cum.	1900	2,090.00	
				Sub Total (M)	2,090.00	
T&P						
				Sub Total (T&P)	-	
				Total Rate (L+M+T&P)	2,580.00	0
				15% Contractor's overhead	387.00	
				Rate per cum. (Contractor's Rate) Excluding VAT	**2,967.00**	
				Rate per cum. (User's Rate) Including VAT in Material	**2,580.00**	

6 Polythene sheet laying

Description: 1 layer 500 gauge clear Polythene sheet laying over sand filling below brick soling in ground floor

Norms **DUDBC** **K4**

Respective clauses of specification

For 10 sqm.

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	0	Md	1000	-	
	Unskilled	0.6	Md	700	420.00	
				Sub Total (L)	420.00	
Materials	Polythene sheet 500 gau	11	sqm.	31	341.00	44.33
				Sub Total (M)	341.00	
T&P						
				Sub Total (T&P)	-	
				Total Rate (L+M+T&P)	761.00	44.33
				15% Contractor's overhead	114.15	
				Rate per sqm. (Contractor's Rate) Excluding VAT	**87.52**	
				Rate per sqm. (User's Rate) Including VAT in Material	**80.53**	

Civil Rate Analysis

F.Y.: 2077/078

7 PCC WORKS

Description	Providing and laying machine mixed Plain Cement Concrete (PCC) with 20mm down aggregate including the necessary side shuttering, mechanical mixing, mechanical compaction, levelling, curing etc, all complete in proper line and lebel as per drawings, specifications and instructions.

7.1 PCC Nominal Mix (1:3:6)- M10

Norms **DUDBC** **D1**

Respective clauses of specification

For 1 cum.

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	1	Md	1000	1,000.00	
	Unskilled	4	Md	700	2,800.00	
				Sub Total (L)	3,800.00	
Materials	Cement	0.22	Mt.	12400	2,728.00	354.64
	40mm Agg.	0.65	cum.	2085	1,355.25	176.1825
	20mm Agg.	0.24	cum.	2085	500.40	65.052
	Sand	0.47	cum.	1900	893.00	116.09
				Sub Total (M)	5,476.65	
T&P						
				Sub Total (T&P)	-	
				Total Rate (L+M+T&P)	9,276.65	711.9645
				15% Contractor's overhead	1,391.50	
				Rate per cum. (Contractor's Rate) Excluding VAT	**10,668.15**	
				Rate per cum. (User's Rate) Including VAT in Material	**9,988.61**	

7.2 PCC Nominal Mix (1:2:4)- M15

Norms **DUDBC** **D1**

Respective clauses of specification

For 1 cum.

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	1	Md	1000	1,000.00	
	Unskilled	4	Md	700	2,800.00	
				Sub Total (L)	3,800.00	
Materials	Cement	0.32	Mt.	12400	3,968.00	515.84
	40mm Agg.	0.52	cum.	2085	1,084.20	140.946
	20mm Agg.	0.22	cum.	2085	458.70	59.631
	10mm Agg.	0.11	cum.	2085	229.35	29.8155
	Sand	0.445	cum.	1900	845.50	109.915
				Sub Total (M)	6,585.75	
T&P						
				Sub Total (T&P)	-	
				Total Rate (L+M+T&P)	10,385.75	856.1475
				15% Contractor's overhead	1,557.86	
				Rate per cum. (Contractor's Rate) Excluding VAT	**11,943.61**	
				Rate per cum. (User's Rate) Including VAT in Material	**11,241.90**	

Civil Rate Analysis

F.Y.: 2077/078

8 RCC WORKS

Description	Cement concrete works using machines on super structures including supplying and placing with haulage upto 30m.

8.1 M25- Nominal Mix (1:1:2), for footings and columns.

Norms **DUDBC** **D4**

Respective clauses of specification

For 1 cum.

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	0.5	Md	1000	500.00	
	Unskilled	3.5	Md	700	2,450.00	
				Sub Total (L)	2,950.00	
Materials	Cement	0.61	Mt.	12400	7,564.00	983.32
	40mm aggr.	0.64	cum.	2085	1,334.40	173.472
	20mm aggr.	0.21	cum.	2085	437.85	56.9205
	Sand	0.425	cum.	1900	807.50	104.975
	Disel	2.5	ltr.	88	220.00	28.6
	Petrol	0.1	ltr.	104	10.40	1.352
				Sub Total (M)	10,374.15	
T&P	Mixer	0.6	hrs.	556.5	333.90	
	Vibrator	0.25	hrs.	2350.69	587.67	
				Sub Total (T&P)	921.57	
				Total Rate (L+M+T&P)	14,245.72	1348.6395
				15% Contractor's overhead	2,136.86	
				Rate per cum. (Contractor's Rate) Excluding VAT	**16,382.58**	
				Rate per cum. (User's Rate) Including VAT in Material	**15,594.36**	

8.2 M20 - Nominal Mix (1:1 1/2 :3) for beams, slabs, staircase

Norms **DUDBC** **D4**

Respective clauses of specification

For 1 cum.

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	0.5	Md	1000	500.00	
	Unskilled	3.5	Md	700	2,450.00	
				Sub Total (L)	2,950.00	
Materials	Cement	0.4	Mt.	12400	4,960.00	644.8
	20mm Agg.	0.57	cum.	2085	1,188.45	154.4985
	10mm Agg.	0.29	cum.	2085	604.65	78.6045
	Sand	0.425	cum.	1900	807.50	104.975
	Disel	2.5	ltr.	88	220.00	28.6
	Petrol	0.1	ltr.	104	10.40	1.352
				Sub Total (M)	7,791.00	
T&P	Mixer	0.6	hrs.	556.5	333.90	
	Vibrator	0.25	hrs.	2350.69	587.67	
				Sub Total (T&P)	921.57	
				Total Rate (L+M+T&P)	11,662.57	1012.83
				15% Contractor's overhead	1,749.39	
				Rate per cum. (Contractor's Rate) Excluding VAT	**13,411.96**	
				Rate per cum. (User's Rate) Including VAT in Material	**12,675.40**	

Civil Rate Analysis

F.Y.: 2077/078

8.3 M15 - Nominal Mix (1:2:4) for sill bands

Norms **DUDBC** **D3**

Respective clauses of specification

For 1 cum.

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	0.5	Md	1000	500.00	
	Unskilled	3.5	Md	700	2,450.00	
				Sub Total (L)	2,950.00	
Materials	Cement	0.32	Mt.	12400	3,968.00	515.84
	40mm Agg.	0.52	cum.	2085	1,084.20	140.946
	20mm Agg.	0.33	cum.	2085	688.05	89.4465
	Sand	0.445	cum.	1900	845.50	109.915
	Disel	3	ltr.	88	264.00	34.32
	Petrol	0.1	ltr.	104	10.40	1.352
				Sub Total (M)	6,860.15	
T&P	Mixer	0.6	hrs.	556.5	333.90	
	Vibrator	0.25	hrs.	2350.69	587.67	
				Sub Total (T&P)	921.57	
				Total Rate (L+M+T&P)	10,731.72	891.8195
				15% Contractor's overhead	1,609.76	
				Rate per cum. (Contractor's Rate) Excluding VAT	**12,341.48**	
				Rate per cum. (User's Rate) Including VAT in Material	**11,623.54**	

8.4 Providing and fixing in position Fe500 steel reinforcement in R.C.C. works including straightening, cutting, bending, binding with 20 SWG annealed wire for tying the reinforcement of all sizes of bars at each junctions including all waste and cut pieces, placing in position with cover block of cement mortar(1:1),fixing of chair, spacers to keep the bars in intended position at all levels as per drawings, specification and instruction (Lapping, Chairs & Spacers will be provided according to joint measurement at site)

Norms **DUDBC** **D9**

Respective clauses of specification

For 1 Mt.

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	12	Md	1000	12,000.00	
	Unskilled	12	Md	700	8,400.00	
				Sub Total (L)	20,400.00	
Materials	Reinforcement (TMT)	1.05	Mt.	79300	83,265.00	10824.45
	G.I Binding Wire	10	kg.	104	1,040.00	135.2
				Sub Total (M)	84,305.00	
T&P						
				Sub Total (T&P)	-	
				Total Rate (L+M+T&P)	104,705.00	10959.65
				15% Contractor's overhead	15,705.75	
				Rate per Mt. (Contractor's Rate) Excluding VAT	**120,410.75**	
				Rate per Mt. (User's Rate) Including VAT in Material	**115,664.65**	

8.5 Providing, fabricating, erecting, centering and shuttering with laminated shuttering plywood formwork in column, slabs, beams, shear walls, sill/lintel bands, stairs etc, in perfect line and level including bracing, proping, de-shuttering at all levels and heights all complete as per drawings, specifications and instructions.

Norms **DUDBC** **E6**

Respective clauses of specification

For 4.2 sqm.

Civil Rate Analysis

F.Y.: 2077/078

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	1.574	Md	1000	1,574.00	
	Unskilled	2.361	Md	700	1,652.70	
				Sub Total (L)	3,226.70	
Materials	Plyboard	0.693	sqm.	1350	935.55	121.6215
	Local wood	0.019	cum.	36000	684.00	88.92
	Metal bolt	0.54	kg.	165	89.10	11.583
	Nails	2.5	kg.	30	75.00	9.75
				Sub Total (M)	1,783.65	
T&P						
				Sub Total (T&P)	-	
				Total Rate (L+M+T&P)	5,010.35	231.8745
				15% Contractor's overhead	751.55	
				Rate per sqm. (Contractor's Rate) Excluding VAT	**1,371.88**	
				Rate per sqm. (User's Rate) Including VAT in Material	**1,248.15**	

9 STONE SOLING

Description	Supply and laying stone soling including filling of sand inside the joints all complete as per instruction of Engineer, drawings and specification

Norms **DUDBC** **C10**

Respective clauses of specification

For 1 cum.

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	0	Md	1000	-	
	Unskilled	1.5	Md	700	1,050.00	
				Sub Total (L)	1,050.00	
Materials	Block Stone	1	cum.	1775	1,775.00	230.75
	Bond Stone	0.2	cum.	1600	320.00	41.6
				Sub Total (M)	2,095.00	
T&P						
				Sub Total (T&P)	-	
				Total Rate (L+M+T&P)	3,145.00	272.35
				15% Contractor's overhead	471.75	
				Rate per sqm. (Contractor's Rate) Excluding VAT	**3,616.75**	
				Rate per sqm. (User's Rate) Including VAT in Material	**3,417.35**	

Civil Rate Analysis

F.Y.: 2077/078

10 BRICK MASONRY

Description	Providing and laying 1st class brick masonry work in specified places in all heights and level including the cost of scaffolding, RCC 3" thk. band in 1:2:4 proportion at every 3'-0" high, curing, raking joints, provision for recesses, openings, toothing etc. all complete as per drawings, specifications and instructions.

10.1 Providing and laying chimney made first class brick work in 1:6 cement mortar in foundation.

Norms **DUDBC** **C2**

Respective clauses of specification 5(2)ka

For 1 cum.

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	1.5	Md	1000	1,500.00	
	Unskilled	2.2	Md	700	1,540.00	
	Unskilled	0.2	Md	700	140.00	
				Sub Total (L)	3,180.00	
Materials	Brick	560	Nos.	14.5	8,120.00	1055.6
	Cement	0.07	Mt.	12400	868.00	112.84
	Sand	0.3	cum.	1900	570.00	74.1
				Sub Total (M)	9,558.00	
T&P	Scaffoldings				4.20	
				Sub Total (T&P)	4.20	
				Total Rate (L+M+T&P)	12,742.20	1242.54
				15% Contractor's overhead	1,911.33	
				Rate per cum. (Contractor's Rate) Excluding VAT	**14,653.53**	
				Rate per cum. (User's Rate) Including VAT in Material	**13,984.74**	

10.2 Providing and laying chimney made first class brick work in 1:6 cement mortar in superstructure

Norms **DUDBC** **C2**

Respective clauses of specification 5(2)kha

For 1 cum.

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	1.5	Md	1000	1,500.00	
	Unskilled	2.2	Md	700	1,540.00	
	Unskilled	0.7	Md	700	490.00	
				Sub Total (L)	3,530.00	
Materials	Brick	560	Nos.	14.5	8,120.00	1055.6
	Cement	0.07	Mt.	12400	868.00	112.84
	Sand	0.3	cum.	1900	570.00	74.1
				Sub Total (M)	9,558.00	
T&P	Scaffoldings				14.70	
				Sub Total (T&P)	14.70	
				Total Rate (L+M+T&P)	13,102.70	1242.54
				15% Contractor's overhead	1,965.41	
				Rate per cum. (Contractor's Rate) Excluding VAT	**15,068.11**	
				Rate per cum. (User's Rate) Including VAT in Material	**14,345.24**	

10.3 Providing and laying 4" thk. chimney made local brick work in 1:4 cement sand mortar in superstructure internal partition wall with RCC band (wall excluding the cost of rcc band).

Norms **DUDBC** **C2**

Respective clauses of specification 5(2)kha

For 1 cum.

Civil Rate Analysis

F.Y.: 2077/078

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	1.5	Md	1000	1,500.00	
	Unskilled	2.2	Md	700	1,540.00	
	Unskilled	0.7	Md	700	490.00	
				Sub Total (L)	3,530.00	
Materials	Brick	560	Nos.	14.5	8,120.00	1055.6
	Cement	0.1	Mt.	12400	1,240.00	161.2
	Sand	0.28	cum.	1900	532.00	69.16
				Sub Total (M)	9,892.00	
T&P	Scaffoldings				14.70	
				Sub Total (T&P)	14.70	
				Total Rate (L+M+T&P)	13,436.70	1285.96
				15% Contractor's overhead	2,015.51	
				Rate per cum. (Contractor's Rate) Excluding VAT	**15,452.21**	
				Rate per cum. (User's Rate) Including VAT in Material	**14,722.66**	

11 SCREEDING

Description: Providing and laying cement concrete flooring of 38mm thickness in volumetric proportion 1:2:4 (1cement : 2sand : 4coarse aggregate 12mm and down grade) in floor all complete as per drawings, specifications and instructions.

Norms **DUDBC** **H1**

Respective clauses of specification 11-1kha

For 10 sqm.

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	1.25	Md	1000	1,250.00	
	Unskilled	2	Md	700	1,400.00	
				Sub Total (L)	2,650.00	
Materials	Cement	0.13	Mt.	12400	1,612.00	209.56
	Sand	0.18	cum.	1900	342.00	44.46
				Sub Total (M)	1,954.00	
T&P						
				Sub Total (T&P)	-	
				Total Rate (L+M+T&P)	4,604.00	254.02
				15% Contractor's overhead	690.60	
				Rate per sqm. (Contractor's Rate) Excluding VAT	**529.46**	
				Rate per sqm. (User's Rate) Including VAT in Material	**485.80**	

Civil Rate Analysis

F.Y.: 2077/078

12 PUNNING

Description	Net Cement Punning works over the Screeding works including necessary curing all complete as per the instruction.

Norms **DUDBC** **H20**

Respective clauses of specification

For 10 sqm.

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	1	Md	1000	1,000.00	
	Unskilled	1	Md	700	700.00	
				Sub Total (L)	1,700.00	
Materials	Cement	0.0532	Mt.	12400	659.68	85.7584
				Sub Total (M)	659.68	
T&P						
				Sub Total (T&P)	-	
				Total Rate (L+M+T&P)	2,359.68	85.7584
				15% Contractor's overhead	353.95	
				Rate per sqm. (Contractor's Rate) Excluding VAT	**271.36**	
				Rate per sqm. (User's Rate) Including VAT in Material	**244.54**	

13 MARBLE FLOORING

Description	Supply, delivery and installation of 16mm thick or more, marble of approved color and pattern over 1:2 cement sand screed for grading, inclusive of cutting, lifting, placement in the floor with cement sand paste, rounding off edges/nosing/moulding, filling of joint with approved coloe joint grout, smoothening , polishing all complete of manpower, material, machinary and installation as per drawings, specifications and instructions of A/E.

Norms **DUDBC** **H33**

Respective clauses of specification

For 10 sqm.

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	2	Md	1000	2,000.00	
	Unskilled	8	Md	700	5,600.00	
				Sub Total (L)	7,600.00	
Materials	Cement	0.13	Mt.	12400	1,612.00	209.56
	Sand	0.183	cum.	1900	347.70	45.201
	16mm Marble	11	sqm.	1460	16,060.00	2087.8
	Oxalic Acid	0.37	kg.	170	62.90	8.177
	Wax	0.118	kg.	620	73.16	9.5108
	Tarpentine	0.538	ltr.	143	76.93	10.0009
	Carborandom Stone		LS		120.00	
				Sub Total (M)	18,352.69	
T&P	Rubbing Labor	13.5	Md		-	
				Sub Total (T&P)	-	
				Total Rate (L+M+T&P)	25,952.69	2370.2497
				15% Contractor's overhead	3,892.90	
				Rate per sqm. (Contractor's Rate) Excluding VAT	**2,984.56**	
				Rate per sqm. (User's Rate) Including VAT in Material	**2,832.29**	

Civil Rate Analysis

F.Y.: 2077/078

14 NON SKID CERAMIC FLOOR TILES

Description: Providing and laying non skid virtified ceramic tiles (Somany or equivalent 2 x 2), for flooring of approved color, shade, size and pattern with minimum of 5 mm thick cement paste above required thickness of 1:6 (cement: sand) grader in flooring with joint filling tile grouts of matching shade all complete as per drawings, specifciations and instructions of A/E.

Norms **DUDBC** **H6**

Respective clauses of specification 11-7

For 10 sqm.

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	13	Md	1000	13,000.00	
	Unskilled	4.5	Md	700	3,150.00	
				Sub Total (L)	16,150.00	
Materials	Cement	0.056	Mt.	12400	694.40	90.272
	Sand	0.152	cum.	1900	288.80	37.544
	White Cement	3.228	kg.	23.75	76.66	9.9658
	Ceramic Tiles	11	sqm.	914.94	10,064.34	1308.3642
				Sub Total (M)	11,124.20	
T&P						
				Sub Total (T&P)	-	
				Total Rate (L+M+T&P)	27,274.20	1446.146
				15% Contractor's overhead	4,091.13	
				Rate per sqm. (Contractor's Rate) Excluding VAT	**3,136.53**	
				Rate per sqm. (User's Rate) Including VAT in Material	**2,872.03**	

15 PLASTER WORKS

Description: Providing and applying cement plaster on walls and ceiling of 12.5-20 mm thick and in perfect line level and plumb and as per the drawings and specifications, engineers instructions all complete.

15.1 Internal Plaster Works (12.5mm 1:4)

Norms **DUDBC** **I1**

Respective clauses of specification

For 100 sqm.

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	12	Md	1000	12,000.00	
	Unskilled	16	Md	700	11,200.00	
				Sub Total (L)	23,200.00	
Materials	Cement	0.538	Mt.	12400	6,671.20	867.256
	Sand	1.46	cum.	1900	2,774.00	360.62
				Sub Total (M)	9,445.20	
T&P						
				Sub Total (T&P)	-	
				Total Rate (L+M+T&P)	32,645.20	1227.876
				15% Contractor's overhead	4,896.78	
				Rate per sqm. (Contractor's Rate) Excluding VAT	**375.42**	
				Rate per sqm. (User's Rate) Including VAT in Material	**338.73**	

Civil Rate Analysis

F.Y.: 2077/078

15.2 External Plaster Works (20mm 1:4)

Norms **DUDBC** **I4**

Respective clauses of specification

For 100 sqm.

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	14	Md	1000	14,000.00	
	Unskilled	19	Md	700	13,300.00	
				Sub Total (L)	27,300.00	
Materials	Cement	0.81	Mt.	12400	10,044.00	1305.72
	Sand	2.2	cum.	1900	4,180.00	543.4
				Sub Total (M)	14,224.00	
T&P						
				Sub Total (T&P)	-	
				Total Rate (L+M+T&P)	41,524.00	1849.12
				15% Contractor's overhead	6,228.60	
				Rate per sqm. (Contractor's Rate) Excluding VAT	**477.53**	
				Rate per sqm. (User's Rate) Including VAT in Material	**433.73**	

15.3 Plaster Works on Ceiling (12.5mm 1:4)

Norms **DUDBC** **I1**

Respective clauses of specification

For 100 sqm.

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	15	Md	1000	15,000.00	
	Unskilled	20	Md	700	14,000.00	
				Sub Total (L)	29,000.00	
Materials	Cement	0.538	Mt.	12400	6,671.20	867.256
	Sand	1.46	cum.	1900	2,774.00	360.62
				Sub Total (M)	9,445.20	
T&P						
				Sub Total (T&P)	-	
				Total Rate (L+M+T&P)	38,445.20	1227.876
				15% Contractor's overhead	5,766.78	
				Rate per sqm. (Contractor's Rate) Excluding VAT	**442.12**	
				Rate per sqm. (User's Rate) Including VAT in Material	**396.73**	

Civil Rate Analysis

F.Y.: 2077/078

16 CERAMIC WALL TILES

Description: Providing and laying glazed ceramic tiles (Somany or equivalent), for wall at T/B & Kitchen of approved color, shade, size and pattern with minimum of 5 mm thick cement paste above required thickness of 1:4 (cement: sand) grader in flooring with joint filling tile grouts of matching shade all complete as per drawings, specifciations and instructions of A/E.

Norms **DUDBC** **H6**

Respective clauses of specification 11-7

For 10 sqm.

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	13	Md	1000	13,000.00	
	Unskilled	4.5	Md	700	3,150.00	
				Sub Total (L)	16,150.00	
Materials	Cement	0.056	Mt.	12400	694.40	90.272
	Sand	0.152	cum.	1900	288.80	37.544
	White Cement	3.228	kg.	23.75	76.66	9.9658
	Glazed Ceramic Tiles	11	sqm.	790	8,690.00	1129.7
				Sub Total (M)	9,749.86	
T&P						
				Sub Total (T&P)	-	
				Total Rate (L+M+T&P)	25,899.86	1267.4818
				15% Contractor's overhead	3,884.98	
				Rate per sqm. (Contractor's Rate) Excluding VAT	**2,978.48**	
				Rate per sqm. (User's Rate) Including VAT in Material	**2,716.73**	

17 WALL PUTTY WORKS

Description: Providing Birla or equivalent brand wall putty over the plastered surface including necessary hacking, chipping, application, sanding of surface all complete as per the instrucition.

Norms **DUDBC** **J1**

Respective clauses of specification

For 100 sqm.

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	1.875	Md	1000	1,875.00	
	Unskilled	1.375	Md	700	962.50	
				Sub Total (L)	2,837.50	
Materials	Putty	22	kg.	110	2,420.00	314.6
	Glue	0.88	kg.	275	242.00	31.46
				Sub Total (M)	2,662.00	
T&P						
				Sub Total (T&P)	-	
				Total Rate (L+M+T&P)	5,499.50	346.06
				15% Contractor's overhead	824.93	
				Rate per sqm. (Contractor's Rate) Excluding VAT	**63.24**	
				Rate per sqm. (User's Rate) Including VAT in Material	**58.46**	

Civil Rate Analysis

F.Y.: 2077/078

18 EMULSION PAINTING

Description: Providing and painting with two or more coats of Berger/Asian or equivalent Easy clean emulsion paint over one coat of primer to give even shade as per specifications and instructions of A/E.

Norms **DUDBC** **J5**

Respective clauses of specification

For 100 sqm.

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	12	Md	1000	12,000.00	
	Unskilled	8	Md	700	5,600.00	
				Sub Total (L)	17,600.00	
Materials	Primer	8.1	ltr.	579	4,689.90	609.687
	Emulsion Paint	16	ltr.	715	11,440.00	1487.2
				Sub Total (M)	16,129.90	
T&P						
				Sub Total (T&P)	-	
				Total Rate (L+M+T&P)	33,729.90	2096.887
				15% Contractor's overhead	5,059.49	
				Rate per sqm. (Contractor's Rate) Excluding VAT	**387.89**	
				Rate per sqm. (User's Rate) Including VAT in Material	**358.27**	

19 WEATHERCOAT PAINTING

Description: Providing and painting with two or more coats of Berger/Asian or equivalent Weather coat paint over one coat of primer to give even shade as per specifications and instructions of A/E.

Norms **DUDBC** **J4**

Respective clauses of specification

For 100 sqm.

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	5	Md	1000	5,000.00	
	Unskilled	5	Md	700	3,500.00	
				Sub Total (L)	8,500.00	
Materials	Weathercoat Paint	48.5	kg.	170	8,245.00	1071.85
				Sub Total (M)	8,245.00	
T&P						
				Sub Total (T&P)	-	
				Total Rate (L+M+T&P)	16,745.00	1071.85
				15% Contractor's overhead	2,511.75	
				Rate per sqm. (Contractor's Rate) Excluding VAT	**192.57**	
				Rate per sqm. (User's Rate) Including VAT in Material	**178.17**	

Civil Rate Analysis

F.Y.: 2077/078

20 SALWOOD DOOR FRAME

Description: Supply, delivery, fabrication and installation of seasoned salwood door frame (3" x 5") anchored to masonry/concrete structure with appropriate mechanism, inclusive of all necessary materials and manpower with 2 coats of approved color enamel paint over wood primer as per drawings design and instructions of A/E.

Norms **DUDBC** **F21**

Respective clauses of specification

For 1 sqm.

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	34	Md	1000	34,000.00	
	Unskilled	3.4	Md	700	2,380.00	
				Sub Total (L)	36,380.00	
Materials	Salwood	1.1	cum.	174840	192,324.00	25002.12
	Holdfast	12	Nos.	55.98	671.76	87.3288
	Screws	184	Nos.	2.33	428.72	55.7336
				Sub Total (M)	193,424.48	
T&P						
				Sub Total (T&P)	-	
				Total Rate (L+M+T&P)	229,804.48	25145.1824
				15% Contractor's overhead	34,470.67	
				Rate per sqm. (Contractor's Rate) Excluding VAT	**264,275.15**	
				Rate per sqm. (User's Rate) Including VAT in Material	**254,949.66**	

21 SOLID CORE DOOR LEAF WITH ACCESSORIES

Description: Supply delivery and installation of solidcore 32mm thick (Surya, sagun or equivalent) single/double leaf doors, inclusive of manpower, materials, machinary, latch locks, 3 no of hinges on each leaf, tower bolt, handles, lipping, door stopper etc with 2 coats of approved color and shade enamel paint as per drawings, design and instructions of A/E.

Norms **DUDBC** **G8**

Respective clauses of specification

For 2.247336 sqm.

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	9	Md	1000	9,000.00	
	Unskilled	0.9	Md	700	630.00	
				Sub Total (L)	9,630.00	
Materials	Salwood	0.0346	cum.	174840	6,049.46	786.4298
	8mm Commercial Ply	1.899	sqm.	926.29	1,759.02	228.6726
	4mm Teak Ply	1.899	sqm.	271.96	516.45	67.1385
	Wooden Listy	7.434	rm.	80	594.72	77.3136
	Glue		LS		60.00	
	100mm Hinge	3	Nos.	30	90.00	11.7
	150mm Towerbolt	2	Nos.	55	110.00	14.3
	Mortis Lock	1	Nos.	250	250.00	32.5
	Screws		LS		45.00	
				Sub Total (M)	9,474.65	
T&P						
				Sub Total (T&P)	-	
				Total Rate (L+M+T&P)	19,104.65	1218.0545
				15% Contractor's overhead	2,865.70	
				Rate per sqm. (Contractor's Rate) Excluding VAT	**9,776.17**	
				Rate per sqm. (User's Rate) Including VAT in Material	**9,043.02**	

Civil Rate Analysis

F.Y.: 2077/078

21 Aluminium Doors

Description: Supply delivery and installation of solidcore 32mm thick (Surya, sagun or equivalent)

Norms **DUDBC** **G8**

Respective clauses of specification

For 2.16 sqm.

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	6.22	Md	1000	6,220.00	
	Unskilled	6.22	Md	700	4,354.00	
				Sub Total (L)	10,574.00	
Materials	Aluminium Doorss; frame size 100 X 50 X 1.2 thk.	1	sqm	6190	6,190.00	804.7
				Sub Total (M)	6,190.00	
T&P						
				Sub Total (T&P)	-	
				Total Rate (L+M+T&P)	16,764.00	804.7
				15% Contractor's overhead	2,514.60	
				Rate per sqm. (Contractor's Rate) Excluding VAT	**8,925.28**	
				Rate per sqm. (User's Rate) Including VAT in Material	**8,133.66**	

22 ALUMINIUM WINDOWS/ VENTILLATIONS

Description: Aluminium Windows and Ventilations; frame size 100 X 50 X 1.2 thk. Titanium anodised with 1.3-1.4 mm thk powder coated 30 micron with 6 mm clear float glass including S.S mosquito wiremesh, U-Shape both side plastic gasket, steel hook locks and screw all Accessories as per drawing all complete.

Norms

Respective clauses of specification

For 1 sqm.

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled		Md	1000	-	
	Unskilled		Md	700	-	
				Sub Total (L)	-	
Materials	Aluminium Windows and Ventilations; frame size 100 X 50 X 1.2 thk.	1	sqm.	5110	5,110.00	664.3
				Sub Total (M)	5,110.00	
T&P						
				Sub Total (T&P)	-	
				Total Rate (L+M+T&P)	5,110.00	664.3
				15% Contractor's overhead	766.50	
				Rate per sqm. (Contractor's Rate) Excluding VAT	**5,876.50**	
				Rate per sqm. (User's Rate) Including VAT in Material	**5,774.30**	

Civil Rate Analysis

F.Y.: 2077/078

23 RAILING WORKS

Description: Supplying and fixing stainless steel railings of top rail of 50mm dia , vertical member of 38mm dia in 2 m distance and two line of 25mm dia intermediate rails in between floors and top rail with painting all complete

Norms **M15**

Respective clauses of specification

For 9.15 rm

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	7.78	Md	1000	7,780.00	
	Unskilled	11.35	Md	700	7,945.00	
				Sub Total (L)	15,725.00	
Materials	50mm Steel Pipe	9.15	rm.	350	3,202.50	416.325
	38mm Steel Pipe	6	rm.	350	2,100.00	273
	25mm Steel Pipe	20	rm.	350	7,000.00	910
	Gas welding and painting		LS		550.00	
				Sub Total (M)	12,852.50	
T&P						
				Sub Total (T&P)	-	
				Total Rate (L+M+T&P)	28,577.50	1599.325
				15% Contractor's overhead	4,286.63	
				Rate per rm. (Contractor's Rate) Excluding VAT	**3,591.71**	
				Rate per rm. (User's Rate) Including VAT in Material	**3,298.01**	

24 WATER PROOFING WORKS

Description: Supply delivery and application of 2 coats of polymer based water proofing coating over smooth and clean concrete surface at specified places with sikka/perma or equivalent water proofing compound, all complete inclusive of manpower, materials, cleaning and smoothening of concrete surface and application as per drawings, specifications and instructions of A/E.

Norms **K7**

Respective clauses of specification

For 1 sqm.

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled		Md	1000	-	
	Unskilled		Md	700	-	
				Sub Total (L)	-	
Materials	Perma seal or equivalent	1	sqm.	350	350.00	45.5
				Sub Total (M)	350.00	
T&P						
				Sub Total (T&P)	-	
				Total Rate (L+M+T&P)	350.00	45.5
				15% Contractor's overhead	52.50	
				Rate per sqm. (Contractor's Rate) Excluding VAT	**402.50**	
				Rate per sqm. (User's Rate) Including VAT in Material	**395.50**	

Civil Rate Analysis

F.Y.: 2077/078

25 MOSAIC FLOORING

Description: 25mm thick moasic flooring 19mm cement plaster 1:2 cement sand with 6mm marble chips on 1:1 white cement along with waxing and polishing all complete.

Norms **DUDBC** **H3**

Respective clauses of specification 11-3

For 10 sqm.

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	3.5	Md	1000	3,500.00	
	Unskilled	36	Md	700	25,200.00	
				Sub Total (L)	28,700.00	
Materials	Cement	0.121	Mt.	12400	1,500.40	195.052
	Sand	0.165	cum.	1900	313.50	40.755
	White cement	0.069	Mt.	23750	1,638.75	213.0375
	3mm marble chips	0.047	sqm.	43.37	2.03	0.2639
	Oxalic acid	0.34	kg.	170	57.80	7.514
	Wax	0.11	kg.	620	68.20	8.866
	Tarpentine	0.538	ltr.	143	76.93	10.0009
	Carborandom Stone		LS		120.00	
				Sub Total (M)	3,777.61	
T&P	Rubbing Labor	13.5	Md		-	
				Sub Total (T&P)	-	
				Total Rate (L+M+T&P)	32,477.61	475.4893
				15% Contractor's overhead	4,871.64	
				Rate per sqm. (Contractor's Rate) Excluding VAT	**3,734.93**	
				Rate per sqm. (User's Rate) Including VAT in Material	**3,295.31**	

26 TRUSS FABRICATION

Description: Fabrication and instillation of all types of black iron pipe with primer paint all complete.

Norms **DUDBC** **M11**

Respective clauses of specification

For 18.94 kg.

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	0.687	Md	1000	687.00	
	Unskilled	0.781	Md	700	546.70	
				Sub Total (L)	1,233.70	
Materials	All types of black iron p	18.94	Mt.	88.00	1,666.72	216.6736
	Primer Paint		LS.		110.00	
				Sub Total (M)	1,776.72	
T&P	Rubbing Labor	13.5	Md		-	
				Sub Total (T&P)	-	
				Total Rate (L+M+T&P)	3,010.42	216.6736
				15% Contractor's overhead	451.56	
				Rate per sqm. (Contractor's Rate) Excluding VAT	**182.79**	
				Rate per sqm. (User's Rate) Including VAT in Material	**170.39**	

Civil Rate Analysis

F.Y.: 2077/078

27 FIBER GLASS PLAIN SHEET ROOFING

Description Supplying and installation of 1.2mm plain fiber glass roof all complete.

Norms **DUDBC** **F15**

Respective clauses of specification

For 10 sqm.

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	1.1	Md	1000	1,100.00	
	Unskilled	1.25	Md	700	875.00	
				Sub Total (L)	1,975.00	
Materials	Fiber glass plain 1.2mm	12	sqm.	314.41	3,772.92	490.4796
	8mm nut bolts	30	Nos.	#REF!	#REF!	
	J-hook	25	Nos.	23.75	593.75	
	Bitumin washer	55	Nos.	1.65	90.75	
				Sub Total (M)	#REF!	
T&P	Rubbing Labor	13.5	Md		-	
				Sub Total (T&P)	-	
				Total Rate (L+M+T&P)	#REF!	490.4796
				15% Contractor's overhead	#REF!	
				Rate per sqm. (Contractor's Rate) Excluding VAT	**#REF!**	
				Rate per sqm. (User's Rate) Including VAT in Material	**#REF!**	

Civil Rate Analysis

F.Y.: 2077/078

28 GUTTER

Description: Supplying and installation of 0.5mm colored sheet 150mm width, 450mm gutter, 40x3 mm bracket, nutbolts, washer all complete.

Norms **DUDBC** **F8**

Respective clauses of specification

For 10 rm.

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	1.75	Md	1000	1,750.00	
	Unskilled	2	Md	700	1,400.00	
				Sub Total (L)	3,150.00	
Materials	0.5mm color plain sheet	13.5	rm.	421	5,683.50	738.855
	Bracket	32	Nos.	81.54	2,609.28	
	Washer	48	Nos.	1.65	79.20	
	Bolt	48	Nos.	15	720.00	
				Sub Total (M)	9,091.98	
T&P	Rubbing Labor	13.5	Md		-	
				Sub Total (T&P)	-	
				Total Rate (L+M+T&P)	12,241.98	738.855
				15% Contractor's overhead	1,836.30	
				Rate per sqm. (Contractor's Rate) Excluding VAT	**1,407.83**	
				Rate per sqm. (User's Rate) Including VAT in Material	**1,298.08**	

29 Broken Brick Filling

Description: Supplying and filling broken bricks for soaking purpose on pit all complete

Norms **DUDBC** **H19**

Respective clauses of specification

For 10 cum.

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	10	Md	1000	10,000.00	
	Unskilled	0	Md	700	-	
				Sub Total (L)	10,000.00	
Materials	Broken Bricks	11	cum.	2500	27,500.00	3575
				Sub Total (M)	27,500.00	
T&P			Md			
				Sub Total (T&P)	-	
				Total Rate (L+M+T&P)	37,500.00	3575
				15% Contractor's overhead	5,625.00	
				Rate per sqm. (Contractor's Rate) Excluding VAT	**4,312.50**	
				Rate per sqm. (User's Rate) Including VAT in Material	**4,107.50**	

Civil Rate Analysis

F.Y.: 2077/078

30 Stone Masonry

Description	Stone Masonry Work including full compensation for all labour, materials and other incidentals required to complete the work as per the specifications and drawings. It includes full compensation for using specially dressed stones on the face of walls with batter and makes provision for weep holes as necessary.

Norms **DUDBC** **C6**

Un-coursed Rubble masonry in 1:4 cement sand mortar

Respective clauses of specification 6 (ka) 1-2

For 1 cum.

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	1.5	Md	1000	1,500.00	
	Unskilled	5	Md	700	3,500.00	
				Sub Total (L)	5,000.00	
Materials	Cement	0.159	Mt.	12400	1,971.60	256.308
	Sand	0.45	cum.	1900	855.00	111.15
	Block stone	1	cum.	1775	1,775.00	230.75
	Bond stone	0.1	cum.	1600	160.00	20.8
				Sub Total (M)	4,761.60	
T&P			Md			
				Sub Total (T&P)	-	
				Total Rate (L+M+T&P)	9,761.60	619.008
				15% Contractor's overhead	1,464.24	
				Rate per cum. (Contractor's Rate) Excluding VAT	**11,225.84**	
				Rate per cum. (User's Rate) Including VAT in Material	**10,380.61**	

31 Flat Brick Soling

Description	Brick soiling in foundation and flooring with brick in true line & level including watering and ramming all complete as per drawing, specification & instruction of engineer.

Norms **DUDBC**

Respective clauses of specification 11-15a

For 10 sqm.

Source	Level	Quantity	Unit	Rate	Amount	VAT in Materials
Labour	Skilled	1.5	Md	1000	1,500.00	
	Unskilled	0	Md	700	-	
				Sub Total (L)	1,500.00	
Materials	Brick	420	Nos.	14.5	6,090.00	791.7
	Sand	0.71	cum.	1900	1,349.00	175.37
				Sub Total (M)	7,439.00	
T&P			Md			
				Sub Total (T&P)	-	
				Total Rate (L+M+T&P)	8,939.00	967.07
				15% Contractor's overhead	1,340.85	
				Rate per sqm. (Contractor's Rate) Excluding VAT	**1,027.99**	
				Rate per sqm. (User's Rate) Including VAT in Material	**990.61**	

Government of Nepal
Ministry of Federal Affairs and Local Development
Ratnanagar Municipality Office
Ratnanagar, Chitwan
F/Y : 2077/078

RATE ANALYSIS FORM

Works : Providing material & applying pressure grouting on RCC Roof slab and basement slab

FOR 1.00 SQM

दर विश्लेषणको लागि १ व. मी. लिइएको

Nor Ms	LABOUR					MATERIAL					REMARKS
Nos	DESCRIPTION	QTY	UNIT	RATE	AMOUNT		QTY	UNIT	RATE	AMOUNT	
	Skilled		Nos	1000	0.00	Pressure Grouting material	1	SQM	50.00	50.00	
	Unskilled		Nos	700	0.00						
TOTAL OF LABOUR (A) PER SQM					0.00	TOTAL OF LABOUR (B) PER SQM				50.00	
TOTAL (A+B) PER SQFT					4.65	TOTAL (A+B) PER SQM				50.00	
CONTRACTOR RATE PER SQM					57.50	CONTRACTOR RATE (WITH VAT) PER SQM				64.98	

Prepared By :

Checked By :

Approved By :

Approved District Rates

F.Y.: 2077/078

Road head Chuthi **8.93** road head to site

S.N	PARTICULAR	UNIT	RATE	transportation by truck	load/unload	AMOUNT	REMARKS
A	Labour						
1	Skilled	Md	1,000.00			1,000.00	
2	Unskilled	Md	700.00			700.00	
B	Civil Materials						
1	Earth/Soil	cum.	950.00			950.00	
2	Sand	cum.	1,900.00			1,900.00	
3	Polythene sheet 500 gauge	sqm.	31.00			31.00	
4	Cement	Mt.	12,400.00			12,400.00	
5	40mm Agg.	cum.	2,085.00			2,085.00	
6	20mm Agg.	cum.	2,085.00			2,085.00	
7	10mm Agg.	cum.	2,085.00			2,085.00	
8	Super plasticizer	ltr.	250.00			250.00	
9	Micro Silica	kg.	320.00			320.00	
10	Disel	ltr.	88.00			88.00	
11	Petrol	ltr.	104.00			104.00	
12	Reinforcement (TMT)	Mt.	79,300.00			79,300.00	
13	G.I Binding Wire	kg.	104.00			104.00	
14	Plyboard	sqm.	1,350.00			1,350.00	
15	Local wood	cum.	36,000.00			36,000.00	
16	Metal bolt	kg.	165.00			165.00	
17	Nails	kg.	30.00			30.00	
18	Block Stone	cum.	1,775.00			1,775.00	
19	Bond Stone	cum.	1,600.00			1,600.00	
20	Brick	Nos.	14.50			14.50	
21	16mm Marble	sqm.	1,460.00			1,460.00	
22	Oxalic Acid	kg.	170.00			170.00	
23	Wax	kg.	620.00			620.00	
24	Tarpentine	ltr.	143.00			143.00	
25	White Cement	kg.	23.75			23.75	
26	Ceramic Tiles	sqm.	914.94			914.94	
27	Glazed Ceramic Tiles	sqm.	790.00			790.00	
28	Putty	kg.	110.00			110.00	
29	Glue	kg.	275.00			275.00	
30	Primer	ltr.	579.00			579.00	
31	Emulsion Paint	ltr.	715.00			715.00	
32	Weathercoat Paint	kg.	170.00			170.00	
33	Salwood	cum.	174,840.00			174,840.00	
34	Holdfast	Nos.	55.98			55.98	
35	Screws	Nos.	2.33			2.33	
36	8mm Commercial Ply	sqm.	926.30			926.29	
37	4mm Teak Ply	sqm.	271.96			271.96	
38	Wooden Listy	rm.	80.00			80.00	
39	100mm Hinge	Nos.	30.00			30.00	
40	150mm Towerbolt	Nos.	55.00			55.00	
41	Mortic Lock	Nos.	250.00			250.00	

Approved District Rates

F.Y.: 2077/078

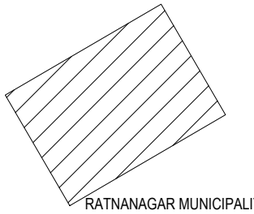
Road head | Chuthi **8.93** | road head to site

42	Aluminium Windows and Ventilations; frame size 100 X 50 X 1.2 thk.	sqm.	8,180.00			8,180.00	
	50mm Steel Pipe	rm.	350.00			350.00	
43	38mm Steel Pipe	rm.	350.00			350.00	
44	25mm Steel Pipe	rm.	350.00			350.00	
45	Perma seal or equivalent	sqm.	350.00			350.00	
46	Excavator	hrs.	2,827.02			2,827.02	
47	Collapsible Gate	sqm.	5,800.00			5,800.00	
48	Two line Stainless steel railing (2"dia., 1"dia. Heavy) for staircase	rm.	3,937.01			3,937.00	
49	Three line Stainless steel railing (2"dia., 1"dia. Heavy) for varendah	rm.	4,265.09			4,265.09	
50	Mixer	hrs.	556.50			556.50	
51	Vibrator	hrs.	2,350.69			2,350.69	
52	3mm marble chips	sqm.	43.38			43.37	
54	Fiber glass plain 1.2mm thic	sqm.	314.41			314.41	
55	8mm nut bolts	Nos.	15.00			15.00	
56	J-hook	Nos.	23.75			23.75	
57	Bitumin washer	Nos.	1.65			1.65	
58	0.5mm color plain sheet	rm.	421.00			421.00	
59	Bracket	Nos.	81.54			81.54	
60	Bolt	Nos.	15.00			15.00	
61	Expansion Joint	rm.	11,400.00			11,400.00	
62	CGI Sheet (26gauge)	sqm.	699.40			699.40	
63	Black Pipe	Kgs	88.00			88.00	

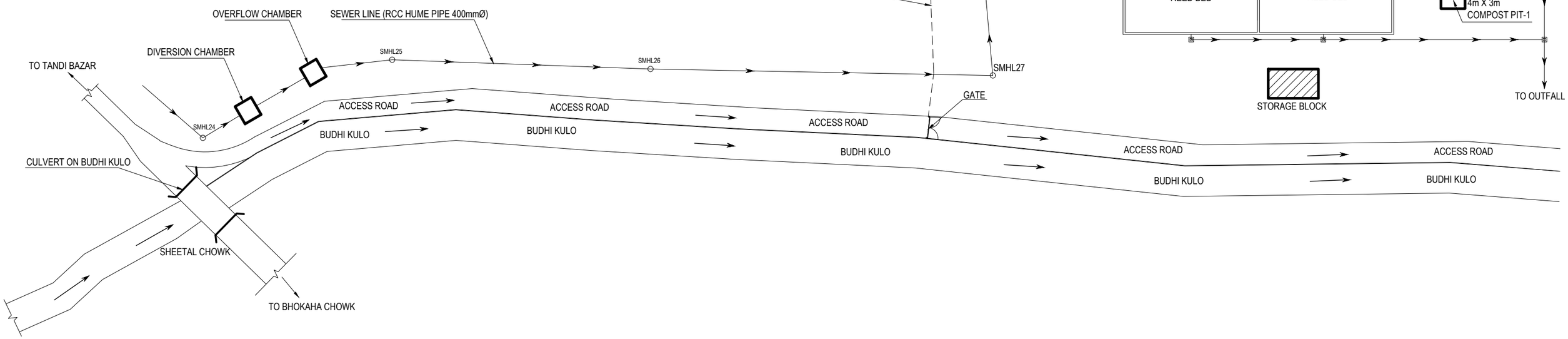
Designed Drawings

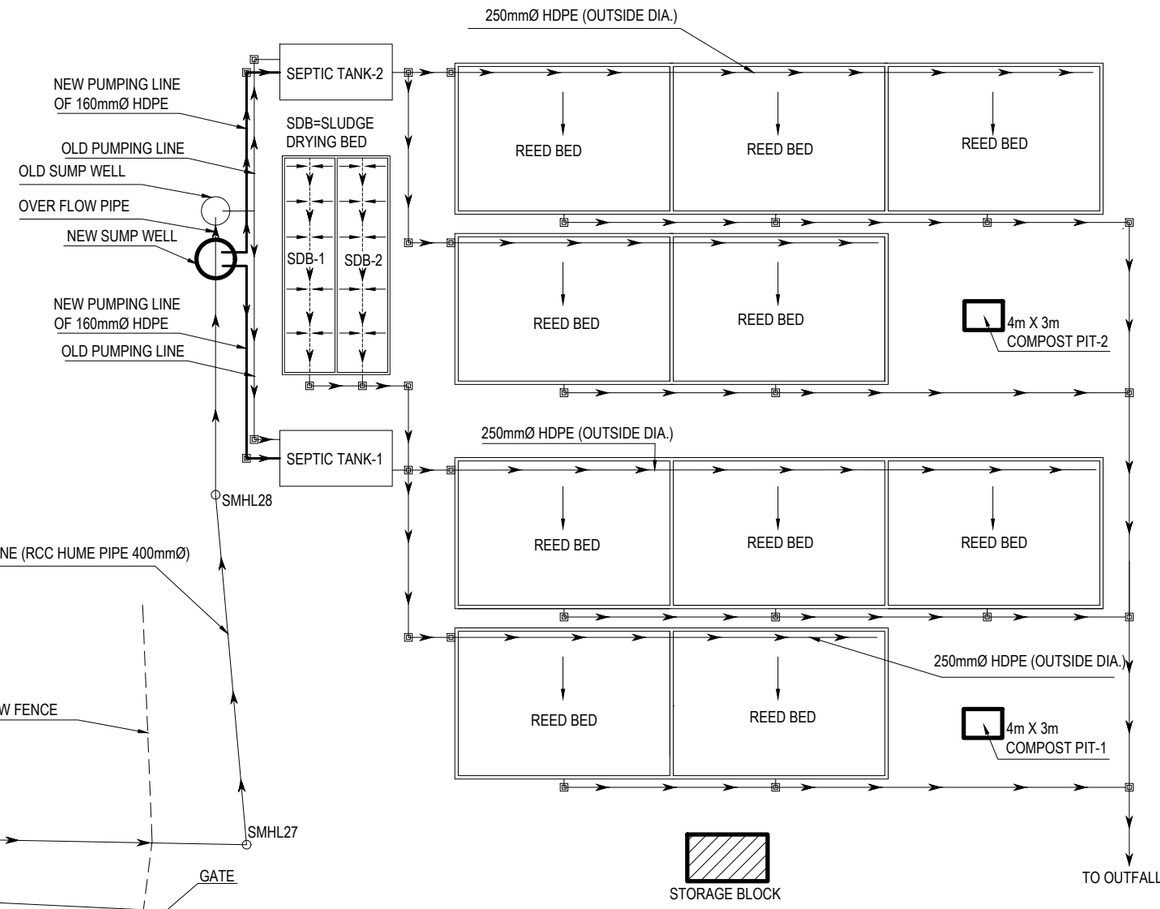
LEGEND

SN	SYMBOL	DESCRIPTION
1	⟶	WASTE WATER PIPELINE
2	○	MANHOLE
3	⧈	INSPECTION CHAMBER
4	------	BW FENCE
5	◯	SUMP WELL
6	⟶	FLOW DIRECTION



RATNANAGAR MUNICIPALITY WARD NO. 04
OFFICE BUILDING





Project Title & Location	Client: **Ratnanagar Municipality Office of the Municipal Executive Chitwan, Bagmati Province, Nepal**	Project: **Engineering Survey and Detail Assessment of Existing Facility of Wastewater Treatment Plant**	Drawn by:	Utkarsha Bhetuwal	Consultant:	Development Resources and Management Consultancy PVT LTD. Kathmandu, Nepal	**Sheet No.**
			Checked by:	Er. Thakur Pandit	Scale:Not in scale	Date : May.2021 / Content :Overall Layout Plan	**01**

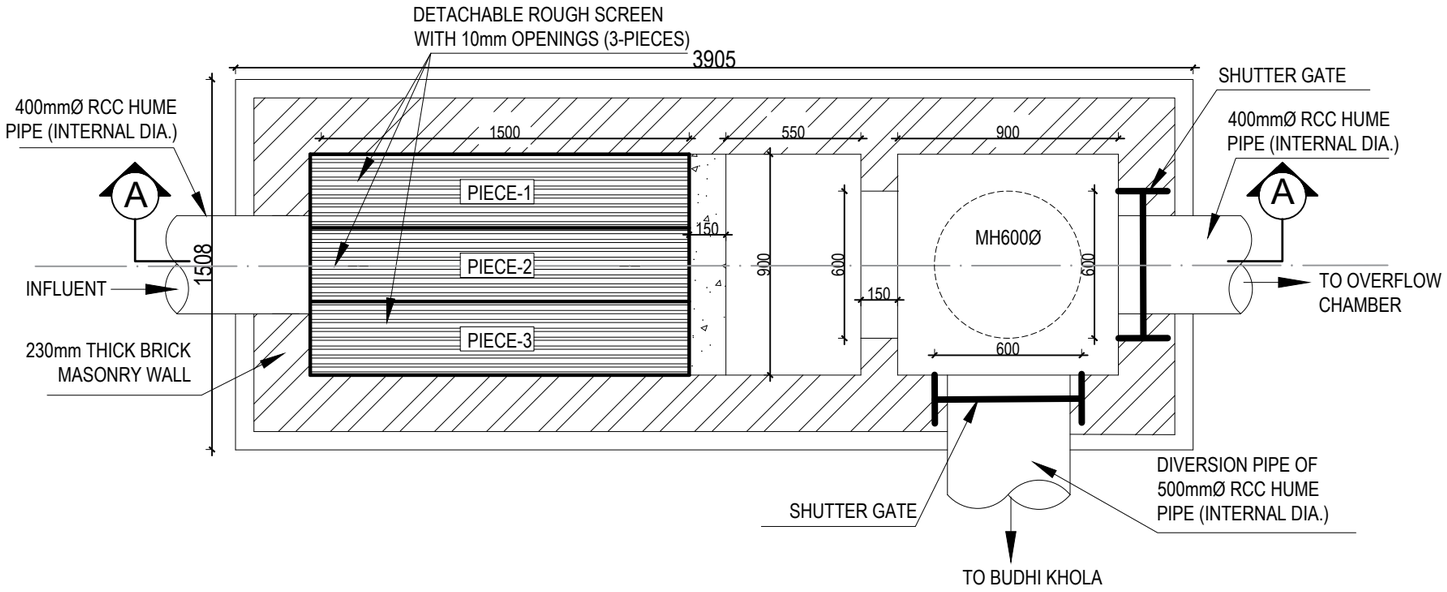


FIG: DIVERSION CHAMBER PLAN

SCALE : 1:25

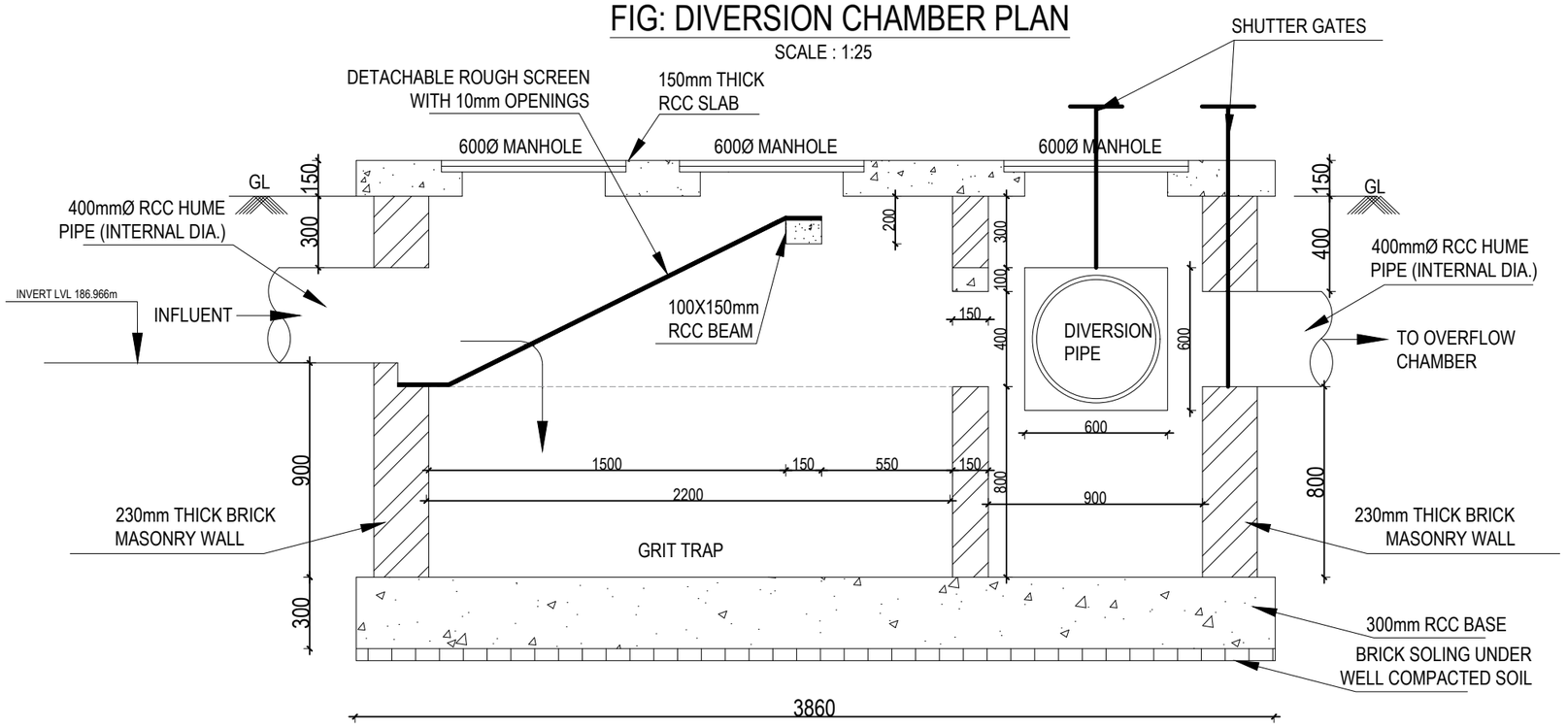


FIG: SECTION AT A-A

SCALE : 1:25

Project Title & Location	Client: **Ratnanagar Municipality Office of the Municipal Executive Chitwan, Bagmati Province, Nepal**	Project: **Engineering Survey and Detail Assessment of Existing Facility of Wastewater Treatment Plant**	Drawn by:	Utkarsha Bhetuwal	Consultant:	Development Resources and Management Consultancy PVT LTD. Kathmandu, Nepal	**Sheet No.**
			Checked by:	Er. Thakur Pandit	Scale:1:25	Date : May.2021 / Content :Diversion Chamber	**02**

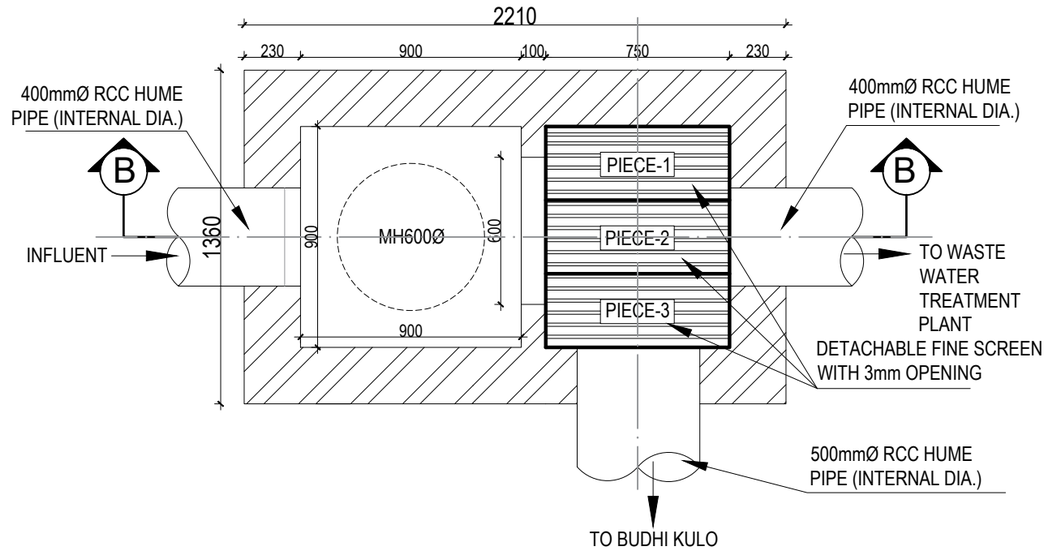


FIG: OVERFLOW CHAMBER PLAN

SCALE : 1:25

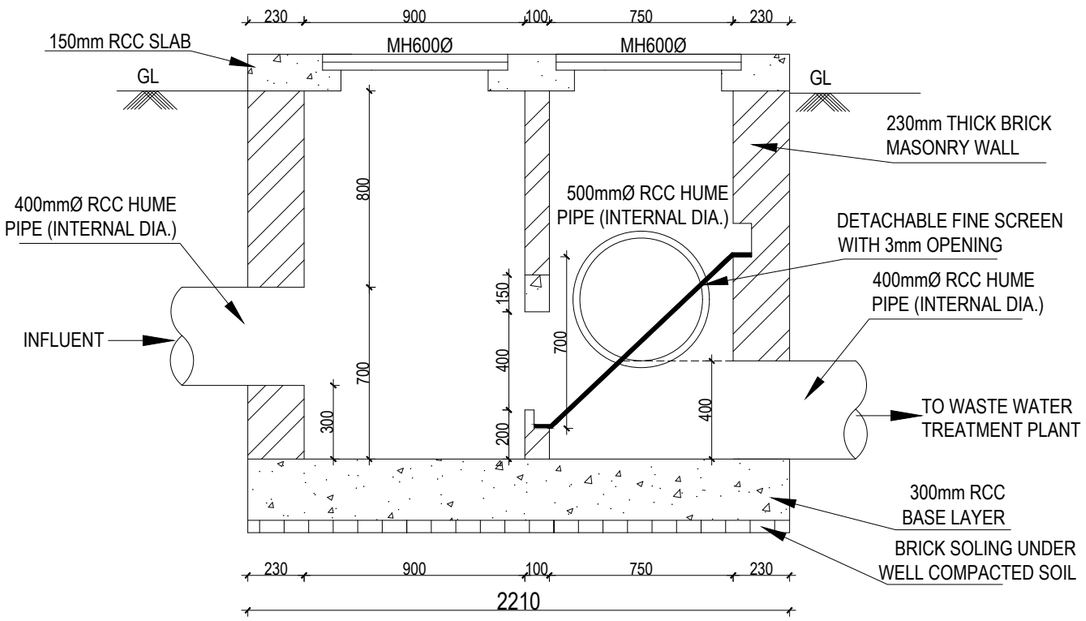


FIG: SECTION AT B-B

SCALE : 1:25

Project Title & Location	Client: **Ratnanagar Municipality Office of the Municipal Executive Chitwan, Bagmati Province, Nepal**	Project: **Engineering Survey and Detail Assessment of Existing Facility of Wastewater Treatment Plant**	Drawn by:	Utkarsha Bhetuwal	Consultant:	Development Resources and Management Consultancy PVT LTD. Kathmandu, Nepal	**Sheet No.**
			Checked by:	Er. Thakur Pandit	Scale:1:25	Date : May.2021 — Content : Overflow Chamber	**03**

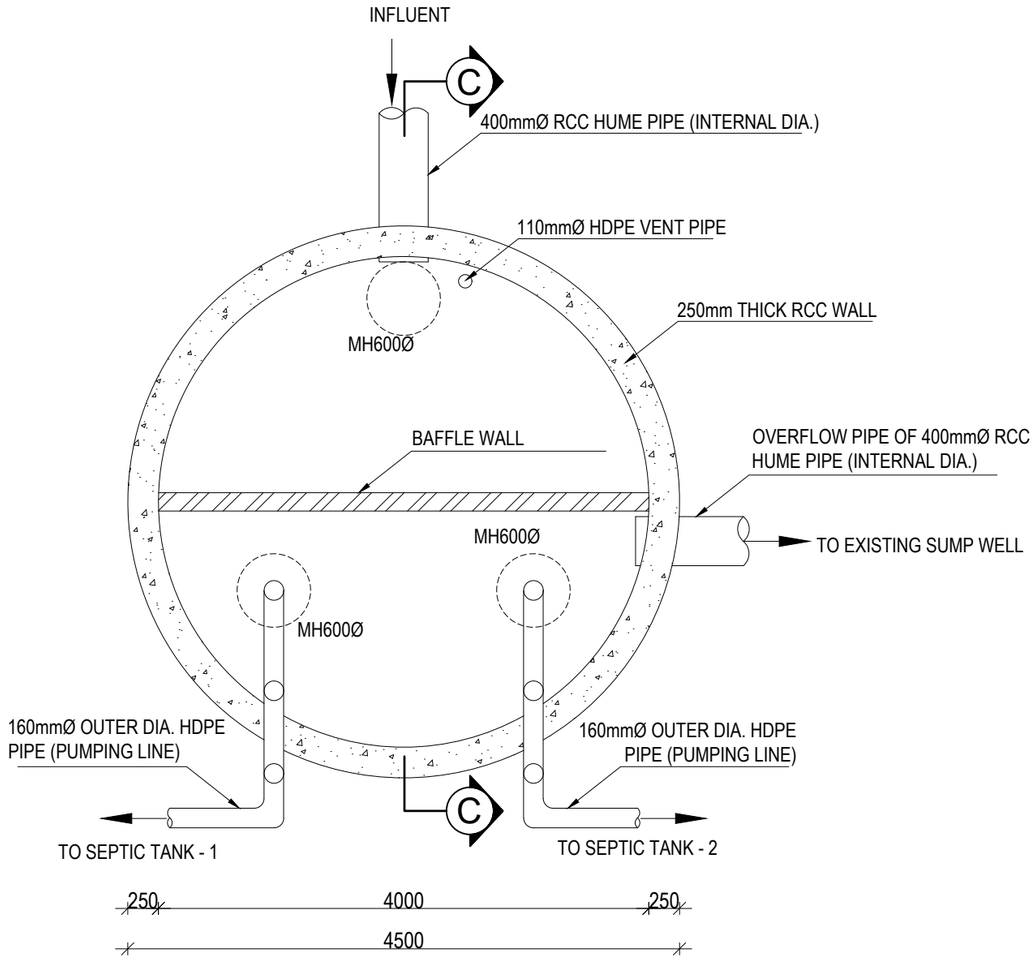


FIG: SUMP WELL PLAN

SCALE : 1:50

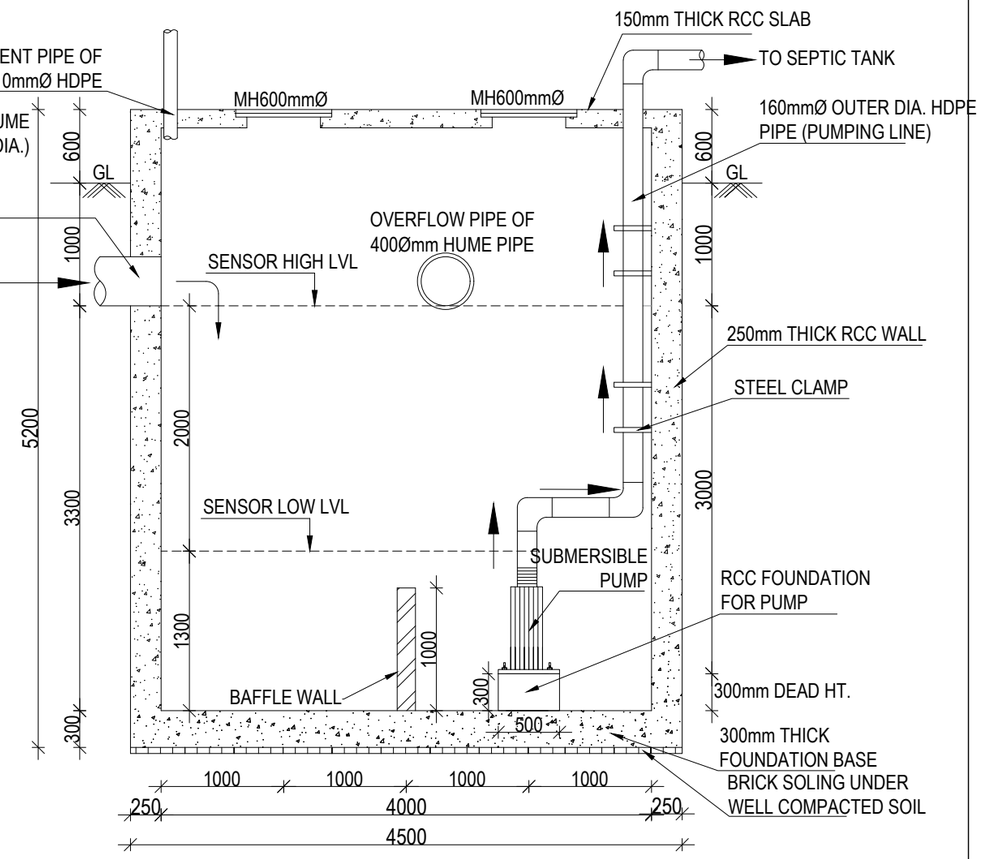


FIG: SECTION AT C-C

SCALE : 1:50

Project Title & Location	Client: **Ratnanagar Municipality Office of the Municipal Executive Chitwan, Bagmati Province, Nepal**	Project: **Engineering Survey and Detail Assessment of Existing Facility of Wastewater Treatment Plant**	Drawn by:	Utkarsha Bhetuwal	Consultant:	Development Resources and Management Consultancy PVT LTD. Kathmandu, Nepal	**Sheet No.**
			Checked by:	Er. Thakur Pandit	Scale:1:50	Date : May.2021	Content : Sump Well	**04**

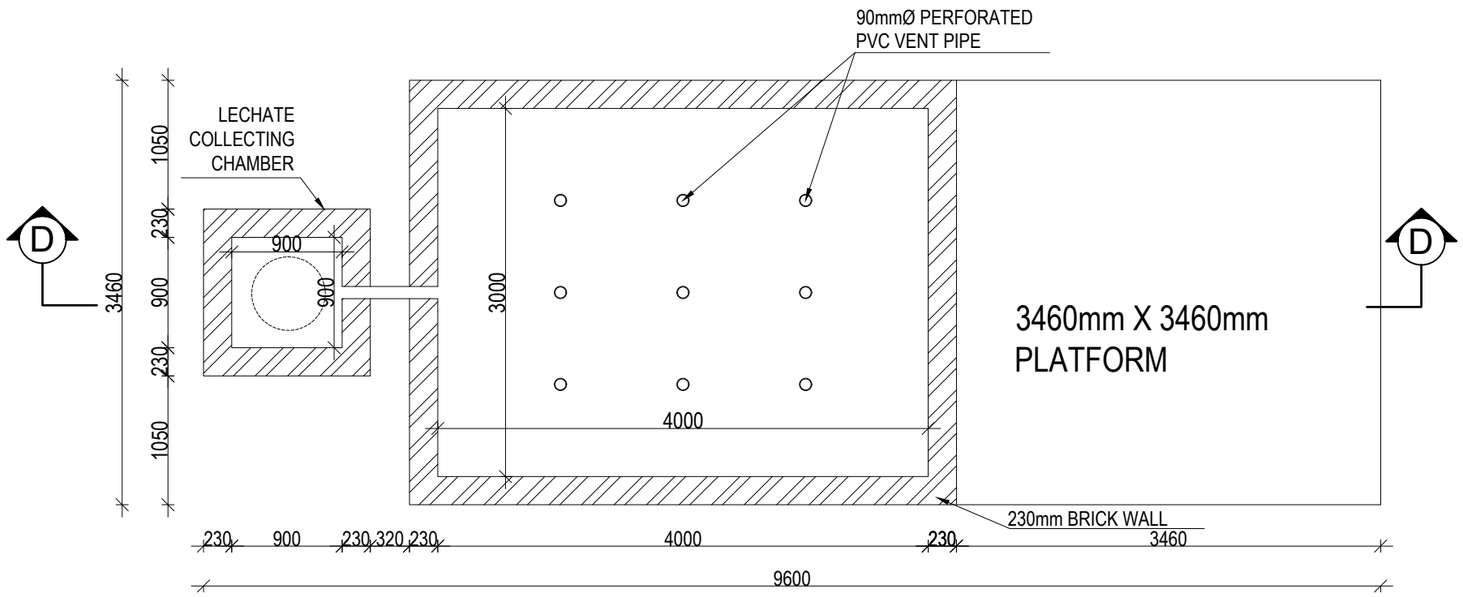


FIG: COMPOST PIT PLAN

SCALE : 1:50

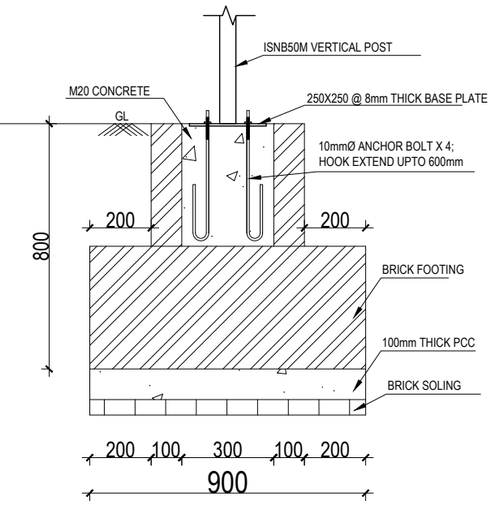


FIG: FOOTING DETAILS

SCALE : 1:20

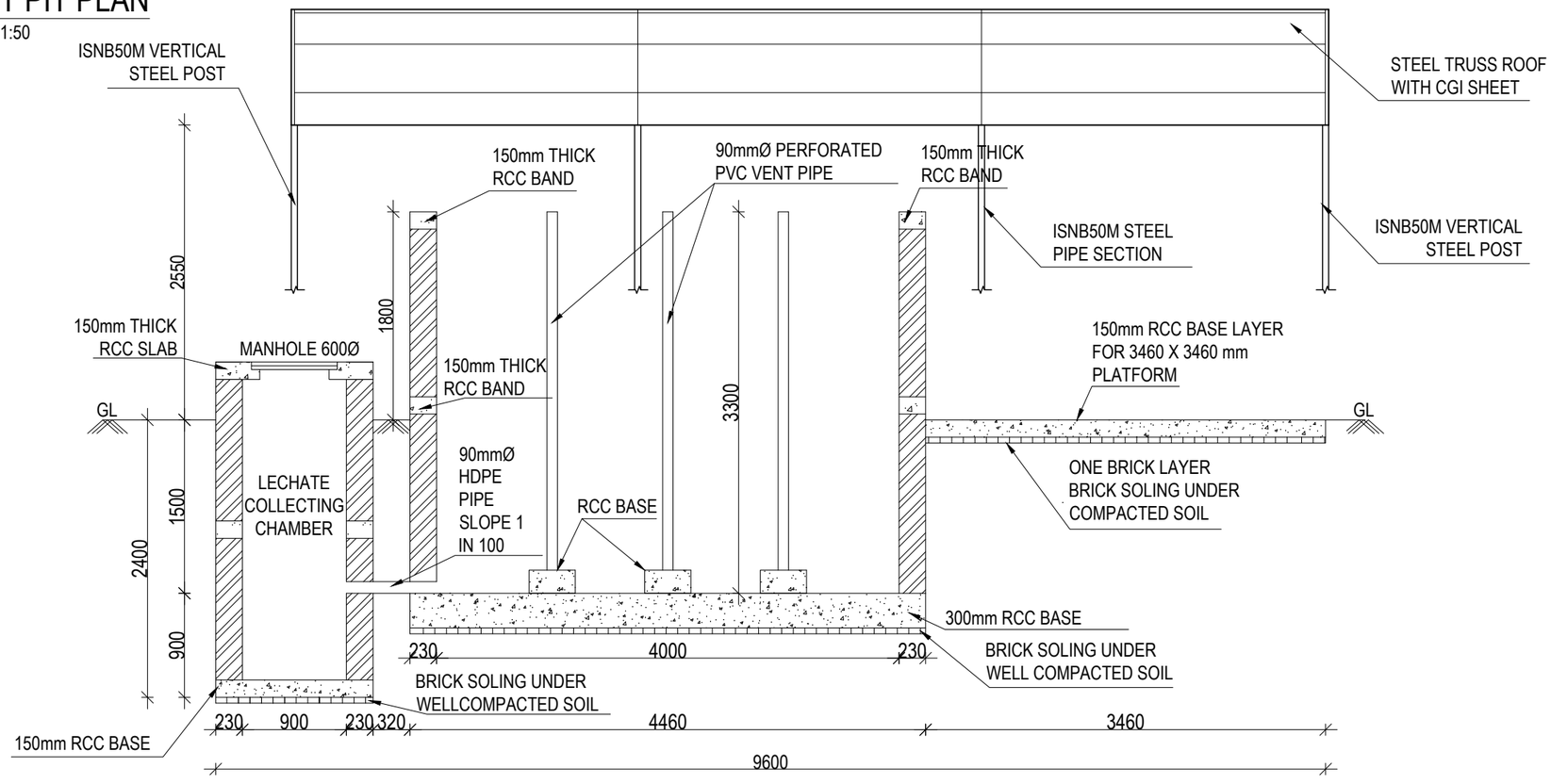


FIG: SECTION AT D-D

SCALE : 1:50

Project Title & Location	Client: **Ratnanagar Municipality Office of the Municipal Executive Chitwan, Bagmati Province, Nepal**	Project: **Engineering Survey and Detail Assessment of Existing Facility of Wastewater Treatment Plant**	Drawn by:	Utkarsha Bhetuwal	Consultant:	Development Resources and Management Consultancy PVT LTD. Kathmandu, Nepal	**Sheet No.**
			Checked by:	Er. Thakur Pandit	Scale:1:50	Date : May.2021	Content : Compost Pit + Footing	**05**

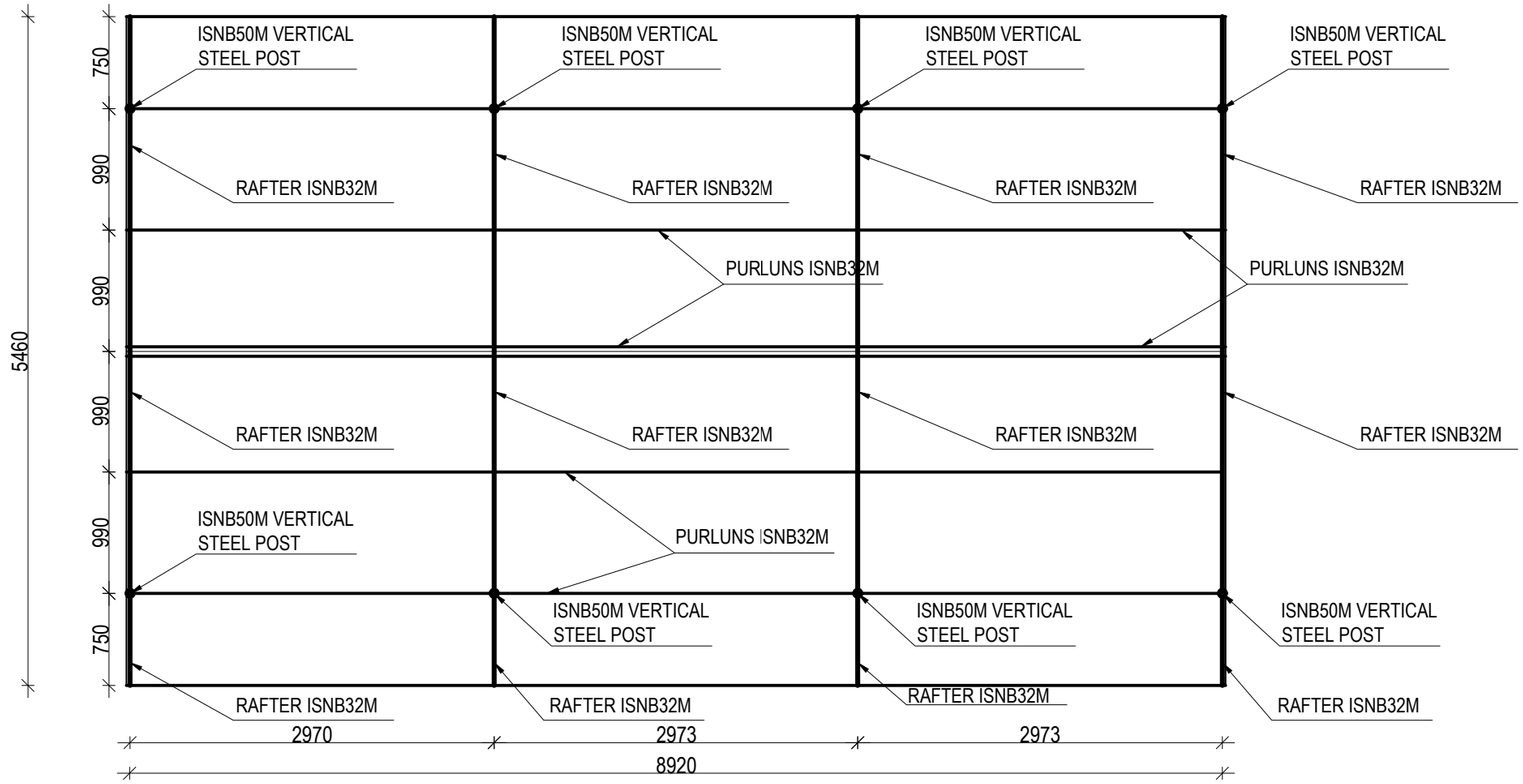


FIG: TRUSS LAYOUT PLAN

SCALE : 1:50

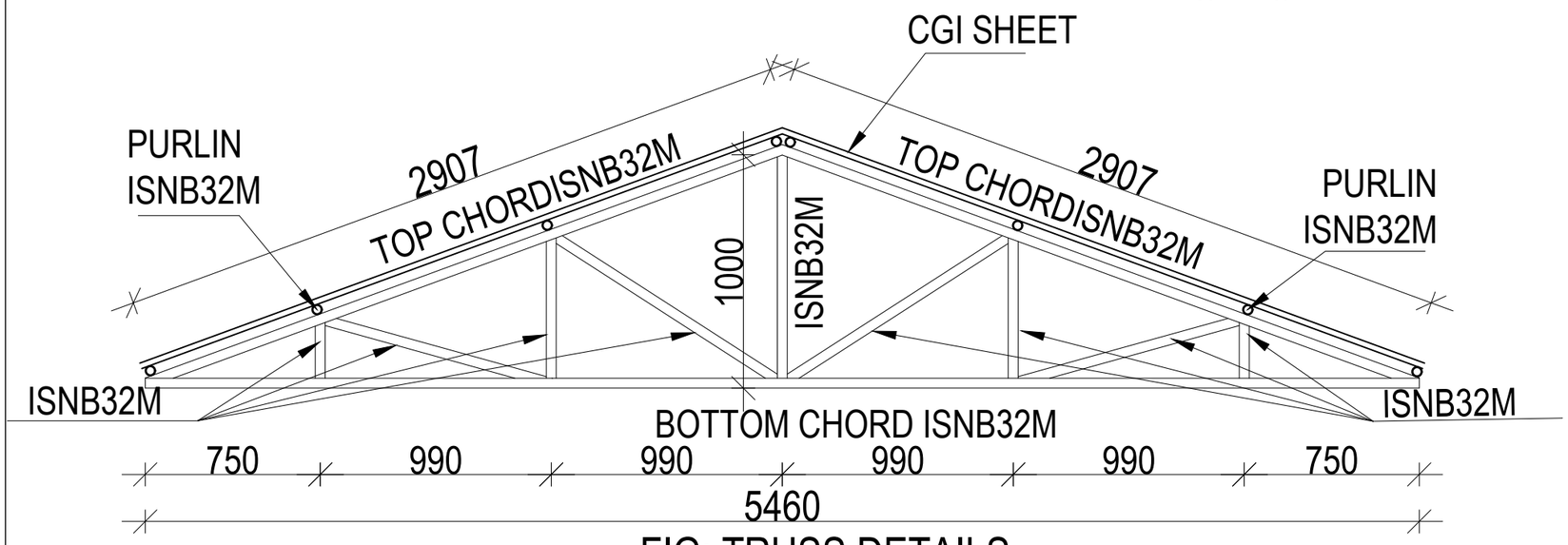
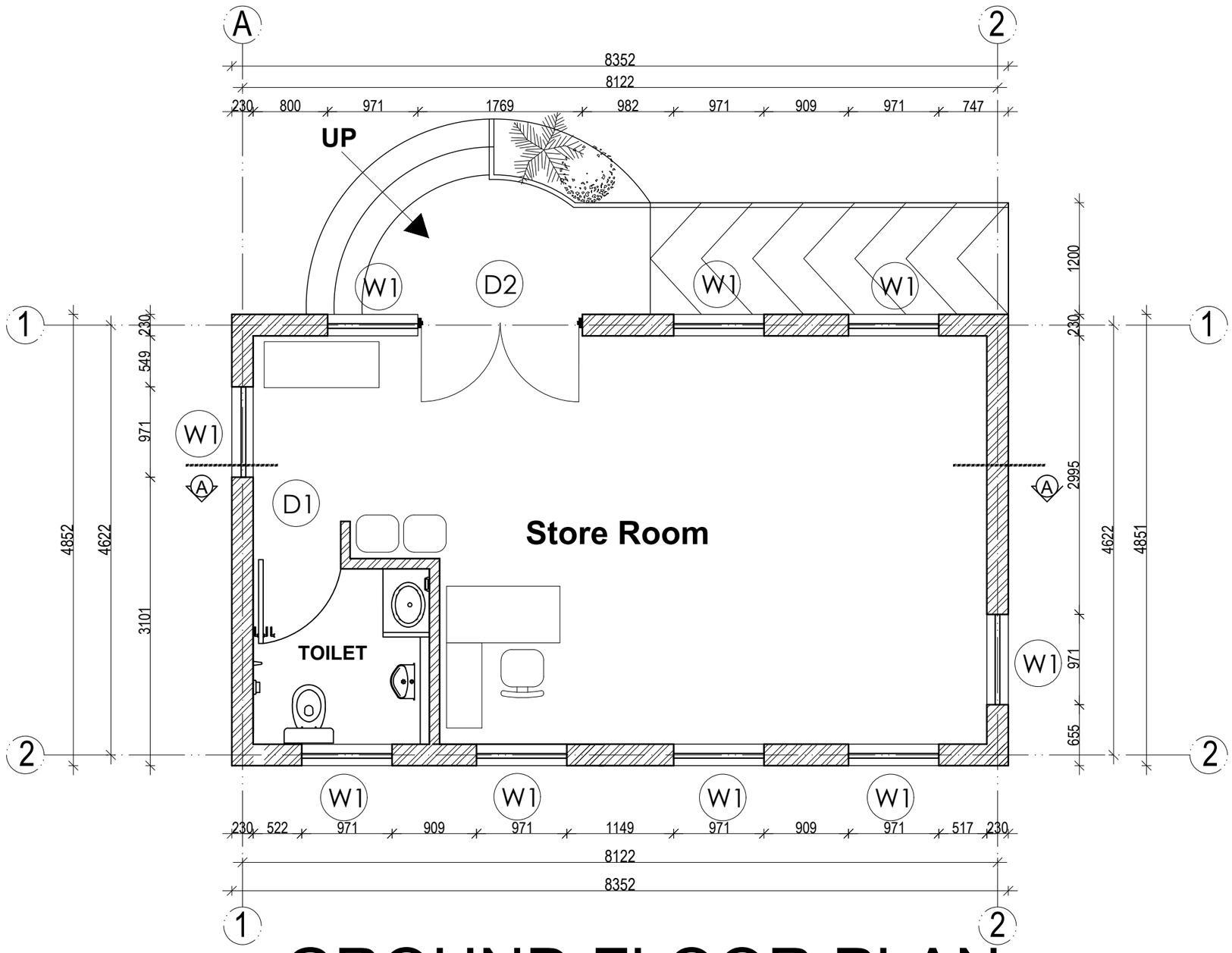


FIG: TRUSS DETAILS

SCALE : 1:25

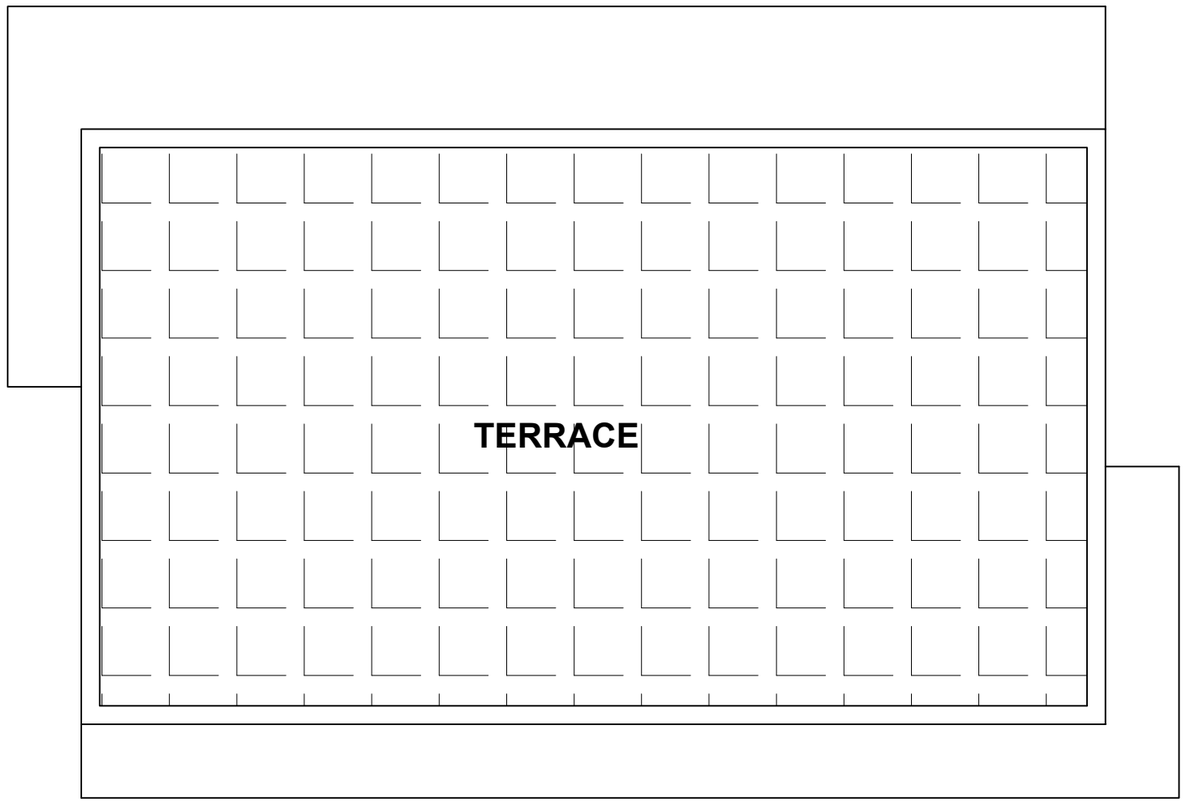
Project Title & Location	Client: **Ratnanagar Municipality Office of the Municipal Executive Chitwan, Bagmati Province, Nepal**	Project: **Engineering Survey and Detail Assessment of Existing Facility of Wastewater Treatment Plant**	Drawn by:	Utkarsha Bhetuwal	Consultant:	Development Resources and Management Consultancy PVT LTD. Kathmandu, Nepal	**Sheet No.**
			Checked by:	Er. Thakur Pandit	Scale:As Shown	Date : May.2021	Content : Compost Pit (Truss)	**06**



GROUND FLOOR PLAN

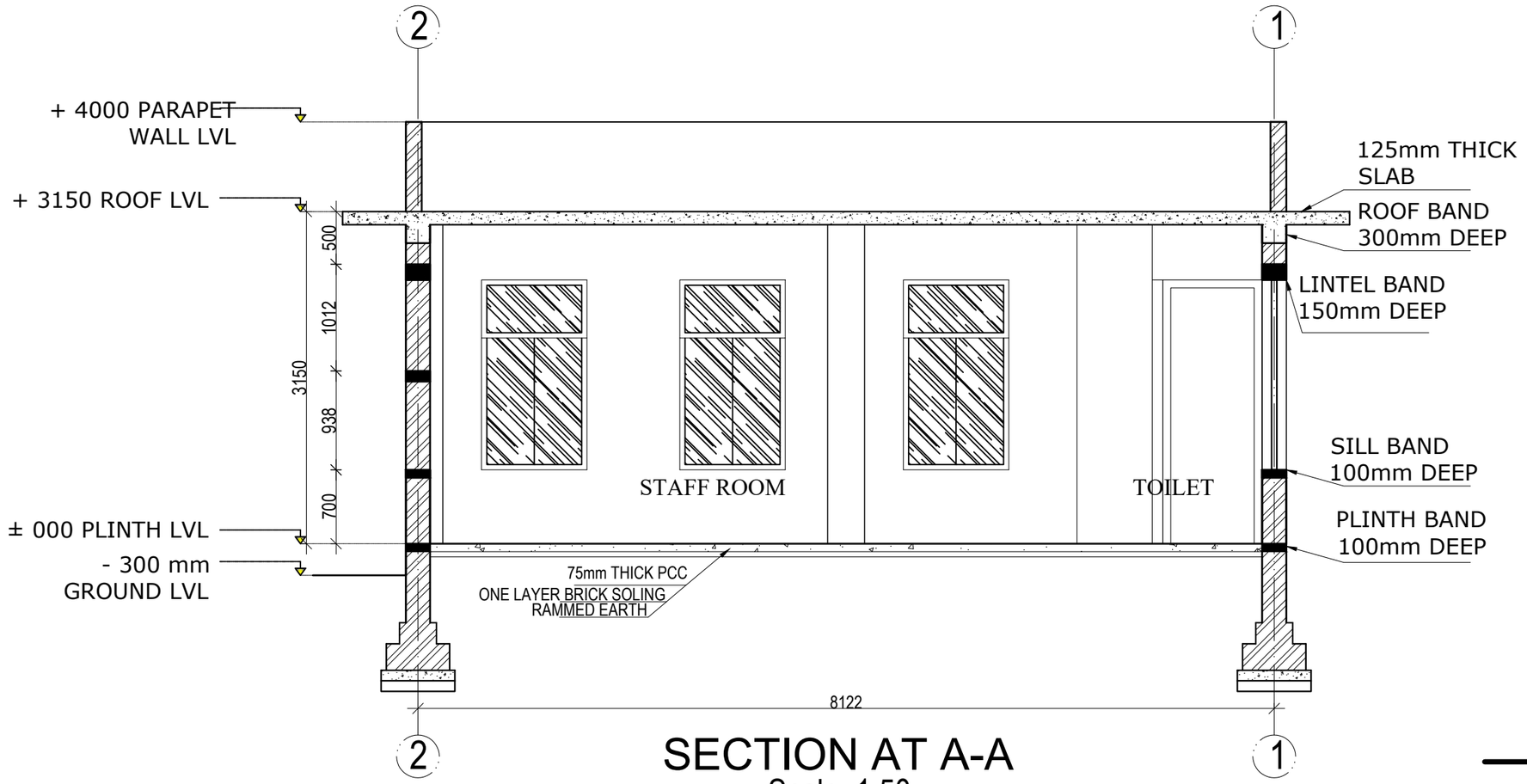
AREA: 40.5 sq.m

Project Title & Location	Client: **Ratnanagar Municipality Office of the Municipal Executive Chitwan, Bagmati Province, Nepal**	Project: **Engineering Survey and Detail Assessment of Existing Facility of Wastewater Treatment Plant**	Drawn by:	Utkarsha Bhetuwal	Consultant:	Development Resources and Management Consultancy PVT LTD. Kathmandu, Nepal		**Sheet No.**
			Checked by:	Er. Thakur Pandit	Scale:1:50	Date : May.2021	Content : Storage Block	**07**

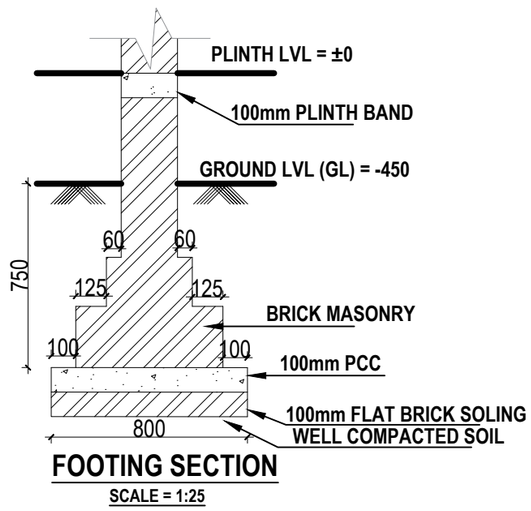


ROOF PLAN

Project Title & Location	Client: **Ratnanagar Municipality Office of the Municipal Executive Chitwan, Bagmati Province, Nepal**	Project: **Engineering Survey and Detail Assessment of Existing Facility of Wastewater Treatment Plant**	Drawn by:	Utkarsha Bhetuwal	Consultant:	Development Resources and Management Consultancy PVT LTD. Kathmandu, Nepal	**Sheet No.**
			Checked by:	Er. Thakur Pandit	Scale:1:50	Date : May.2021 Content : Storage Block	**08**

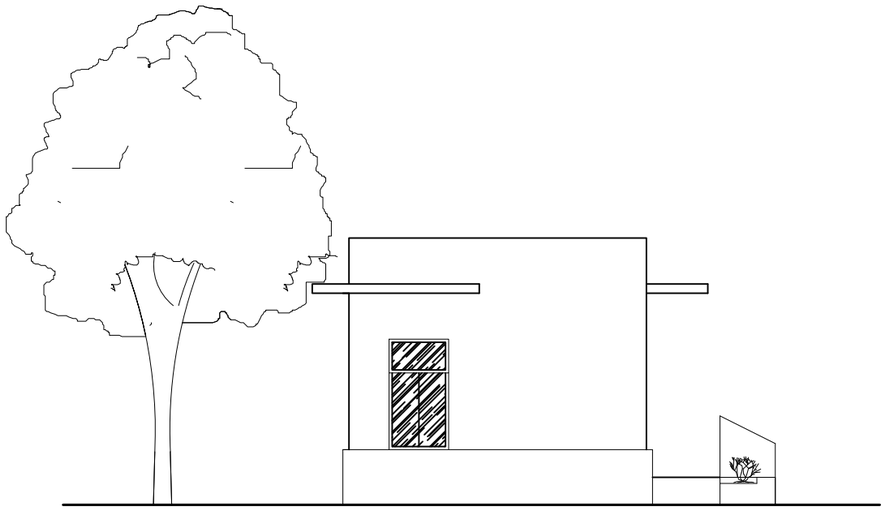


SECTION AT A-A
Scale: 1:50

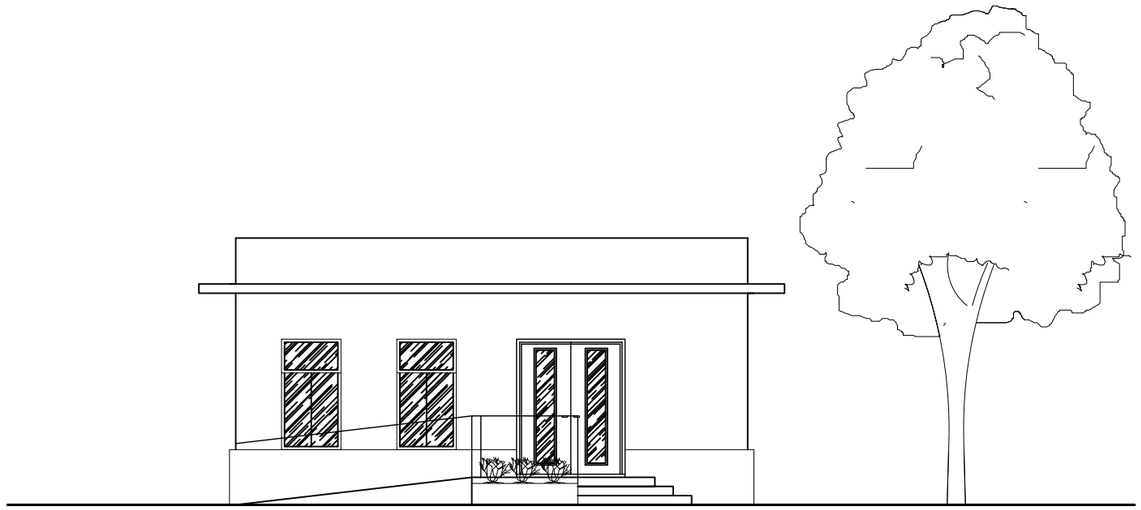


FOOTING SECTION
SCALE = 1:25

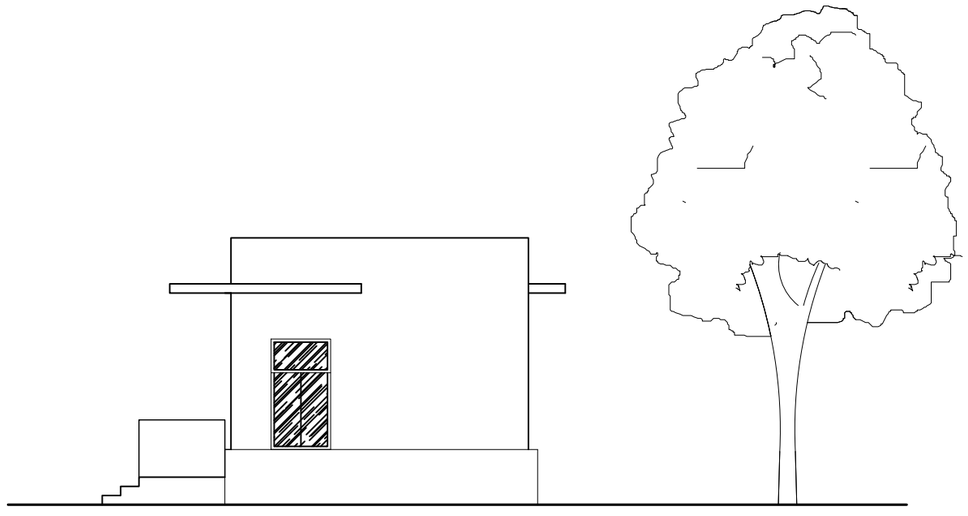
Project Title & Location	Client: **Ratnanagar Municipality Office of the Municipal Executive Chitwan, Bagmati Province, Nepal**	Project: **Engineering Survey and Detail Assessment of Existing Facility of Wastewater Treatment Plant**	Drawn by:	Utkarsha Bhetuwal	Consultant:	Development Resources and Management Consultancy PVT LTD. Kathmandu, Nepal	**Sheet No.**
			Checked by:	Er. Thakur Pandit	Scale: As Shown	Date : May.2021 / Content : Storage Block	**09**



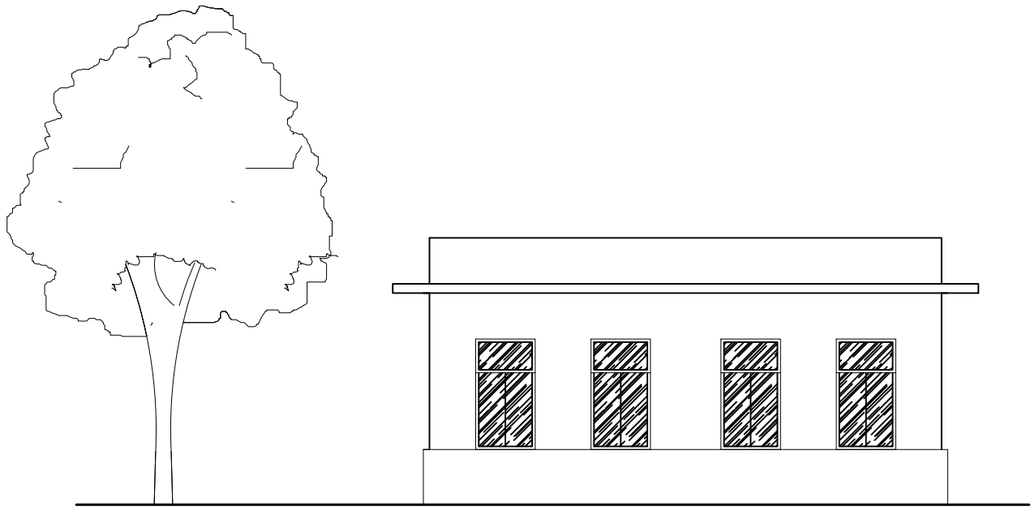
SIDE ELEVATION



FRONT ELEVATION



SIDE ELEVATION



BACK ELEVATION

Project Title & Location	Client: **Ratnanagar Municipality Office of the Municipal Executive Chitwan, Bagmati Province, Nepal**	Project: **Engineering Survey and Detail Assessment of Existing Facility of Wastewater Treatment Plant**	Drawn by:	Utkarsha Bhetuwal	Consultant:	Development Resources and Management Consultancy PVT LTD. Kathmandu, Nepal	**Sheet No.**
			Checked by:	Er. Thakur Pandit	Scale:1:50	Date : 1:100	Content : Storage Block	**10**