PROJECT

PROPOSED NON STAR / BUDGET HOTEL LOCATED AT KHASRA NO 1128M, VILLAGE NOORNAGAR GHAZIABAD (U.P)

SUBJECT

MEP SERVICES

PROJECT REPORT

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INTRODUCTION

The proposed project is a commercial and hotel building, located at Khasra N0 1128M, Village Noornagar, Ghaziabad, U.P. The building consists of Commercial shops, Dining/Restaurants, Hotel rooms and parking with all modern amenities to be developed on land of approx. 4986.04 Square Meters.

This report intends to basically highlight the technical proposals/points/ parameters, which are proposed to be adopted in the planning and designing of internal & external sanitary engineering for the upcoming master plan.

WATER REQUIREMENT

During construction phase water will be supplied by private water tankers, whereas during operation phase water supply will be provided through the Municipal water supply/tube wells. Total water requirement is approx. 236 KLD, out of which Domestic water requirement is 159 KLD. Flushing water requirement is approx. 75.5 KLD. Daily water requirement calculation is given below in Table 1,2&3:

Table 1: Calculations for Daily Fresh Water Demand

DOMESTIC WATER REQUIREMENT						
S. No.	**Description**	**Occupancy**	**Units/Area**	**Total Population**	**Total water Req.**	
					L/Head	**LPD**
COMMERCIAL COMPLEX						
1	Guest Room	160 units	2 person/unit	320	260	83200
	Staff	10% of hotel population		32	25	800
2	Commercial Area					
	1st Basement + Ground floor	1675 sqm	3 sqm/person	559		
	First floor	727 sqm	6 sqm/person	122		
	Visitors	90% of total population of commercial area	-	613	5	3065
	Staff	10% of total population of commercial area	-	69	25	1725
3	Multipurpose hall					
	Basement	611 sqm	1.8 sqm/person	340	25	8500
	Ground floor	931 sqm	1.8 sqm/person	518	25	12950
	First floor	1031 sqm	1.8 sqm/person	573	25	14325
	Second floor	1758 sqm	1.8 sqm/person	977	25	24425
4	KITCHEN				L.S.	10000
Total Water Requirement						**158990**
SAY						**160KL**

Table 2: Calculations for Daily Flushing Water Demand

FLUSHING WATER REQUIREMENT						
S. No.	Description	Occupancy	Units/Area	Total Population	Total water Req.	
					L/Head	LPD
COMMERCIAL COMPLEX						
1	Guest Room	160 units	2 person/unit	320	60	19200
	Staff	10% of hotel population		32	20	640
2	Commercial Area					
	1st Basement + Ground floor	1675 sqm	3 sqm/person	559		
	First floor	727 sqm	6 sqm/person	122		
	Visitors	90% of total population of commercial area	-	613	10	6130
	Staff	10% of total population of commercial area	-	69	20	1380
3	Multipurpose hall					
	Basement	611 sqm	1.8 sqm/person	340	20	6800
	Ground floor	931 sqm	1.8 sqm/person	518	20	10360
	First floor	1031 sqm	1.8 sqm/person	573	20	11460
	Second floor	1758 sqm	1.8 sqm/person	977	20	19540
Total Water Requirement						**75510**
SAY						**80KL**

Table-3 : Water Calculations

Total Water Requirement	
• Domestic Water Requirement	159 KLD
• Horticulture and Irrigation @ 6 L/Sqm	1.5 KLD
• Flushing Water Requirement	75.5 KLD
TOTAL	**236 KLD**

Table-4 : STP CAPACITY

Waste Water Generated • 80% of Domestic Water • 100% of Flushing Water Total	 127.2 KLD 75.5 KLD 202.7 KLD
STP Proposed	**205 KLD**

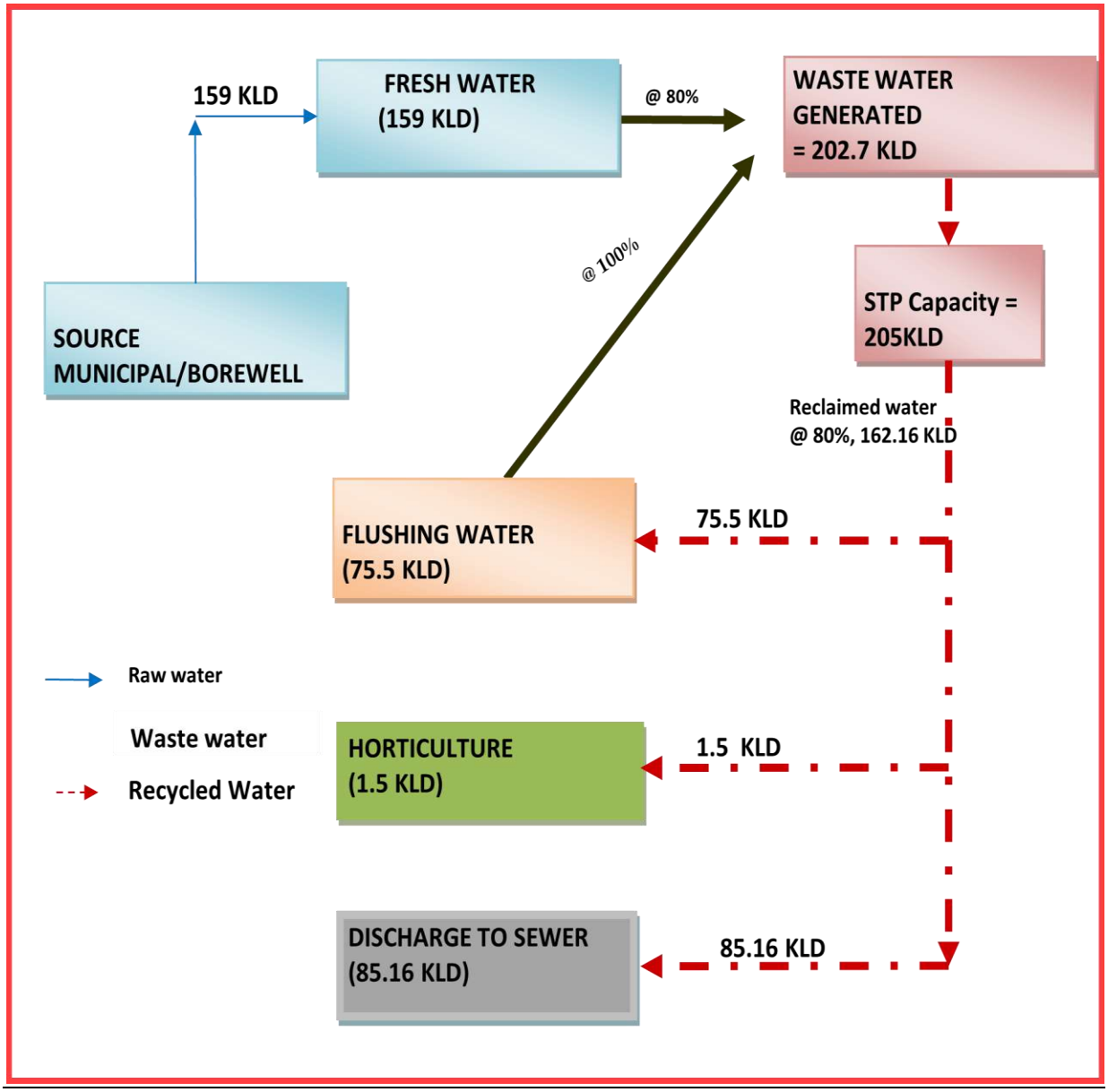


Figure 1: Water Balance Diagram for non-rainy season

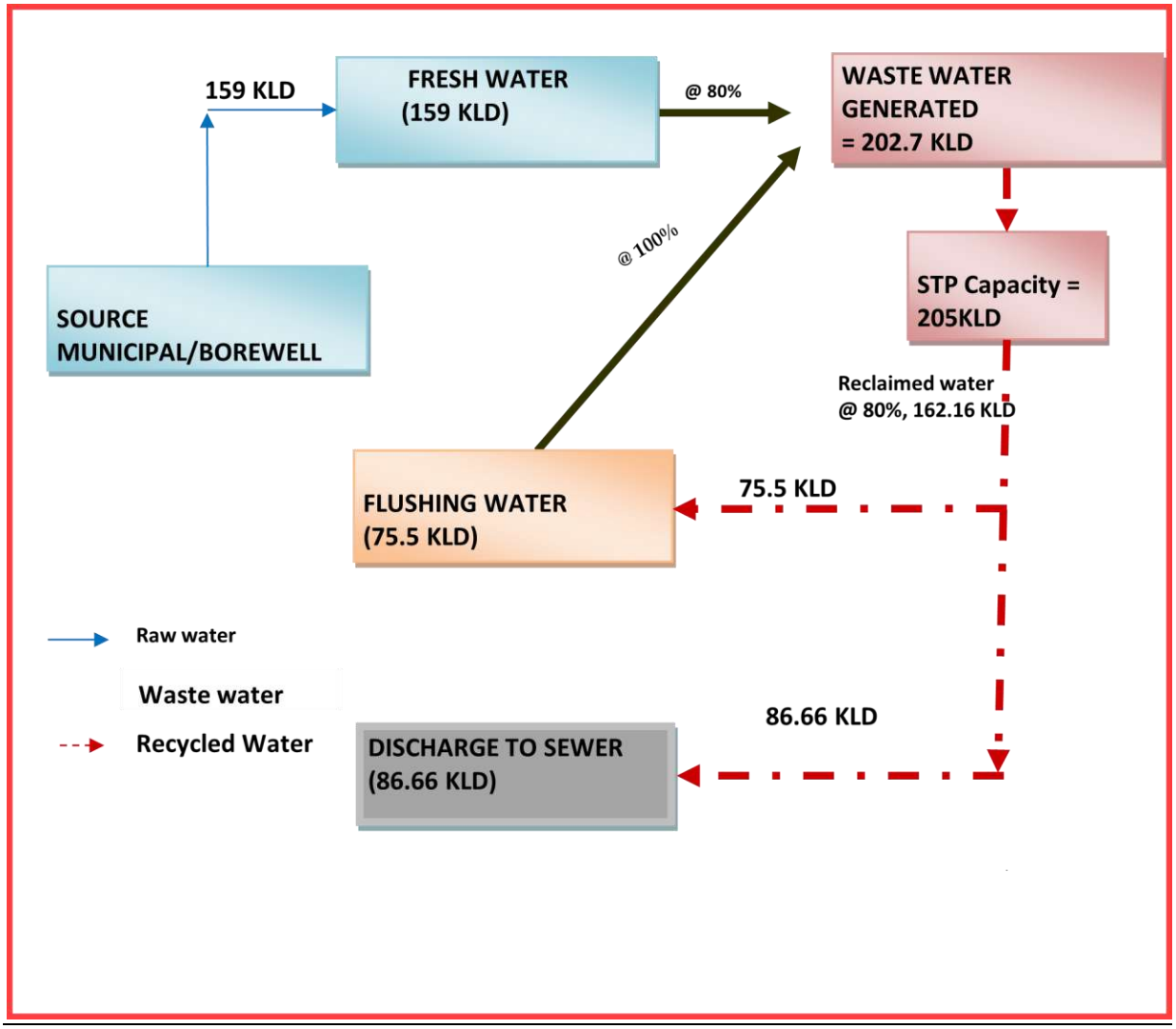


Figure 2: Water Balance Diagram for rainy season

Wastewater Generation & Treatment

It is expected that 202.7 KLD of wastewater shall be generated from project site during operation phase. Wastewater will be treated in the STP provided within the complex generating 162.16 KLD of recoverable water from STP which will be recycled within the project but 85.16 KLD during non- rainy season and 86.66 KLD during rainy season will become surplus and will be discharged to sewer line.

SEWAGE TREATMENT TECHNOLOGY

Sewage generated from the project will be treated in centralized sewage treatment plant of 205 KL/DAY capacity. Treatment will be done to achieve treated effluent to permissible limit to reuse for various non-domestic applications.

SEWAGE TREATMENT SYSTEM

The membrane bioreactor (MBR) has emerged as an efficient compact technology for municipal and industrial wastewater treatment. The major drawback impeding wider application of MBRs is membrane fouling, which significantly reduces membrane performance and lifespan, resulting in a significant increase in maintenance and operating costs. Finding sustainable membrane fouling mitigation strategies in MBRs has been one of the main concerns over the last two decades. This paper provides an overview of membrane fouling and studies conducted to identify mitigating strategies for fouling in MBRs. Classes of foulants, including biofoulants, organic foulants and inorganic foulants, as well as factors influencing membrane fouling are outlined. Recent research attempts on fouling control, including addition of coagulants and adsorbents, combination of aerobic granulation with MBRs, introduction of granular materials with air scouring in the MBR tank, and quorum quenching are presented. The addition of coagulants and adsorbents shows a significant membrane fouling reduction, but further research is needed to establish optimum dosages of the various coagulants/adsorbents. Similarly, the integration of aerobic granulation with MBRs, which targets biofoulants and organic foulants, shows outstanding filtration performance and a significant reduction in fouling rate, as well as excellent nutrients removal. However, further research is needed on the enhancement of long-term granule integrity. Quorum quenching also offers a strong potential for fouling control, but pilot-scale testing is required to explore the feasibility of full-scale application.

Keywords: aerobic granulation, extracellular polymeric substances (EPS), membrane bioreactor (MBR), membrane fouling, quorum quenching, soluble microbial products (SMPs), wastewater treatment.

GENERAL INFORMATION

Treated Sewage Quality

The treatment plant shall be guaranteed to produce Sewage with following characteristics as per the requirement of the Pollution Control Board.

1. <u>Wastewater Details</u>

(a)	Daily load	:	205 KLD
(b)	Duration of flow to STP	:	24 hours
(c)	Temperature	:	Maximum 32^{o}C
(d)	pH	:	7 to 9.5
(e)	Colour	:	Mild
(f)	T.S.S. (mg/l)	:	100-400 mg/l
(g)	BOD (mg/l)	:	200-300 mg/l
(h)	COD (mg/l)	:	500-700 mg/l

2. <u>Final discharge characteristics</u>

(a)	pH	:	6.5 to 7.5
(b)	Oil & Grease	:	<10 mg/l
(c)	B.O.D.	:	<20 mg/l
(d)	C.O.D.	:	<100 mg/l
(e)	Total Suspended Solids	:	<10 mg/l

Treated sewage quality shall be checked for composite samples with at least 95% compliance in a month.

TREATMENT CONCEPT

Domestic sewage effluent from the units will flow through Bar Screen, Oil Skimmer and collected in equalization tank.

The homogenized and mixed wastewater in the equalization tank shall be pumped through fine screening before entering the MBR.

An internally-fed screen with punched-hole openings less than or equal to 2-3 mm in diameter with no possibility of bypass or carryover is absolutely required to maintain both membrane warranty, and optimal MBR operation.

Effluent from the Equalization tank and Return Activated Sludge (RAS) being pumped from the membrane tank must be mixed and fed into the bioreactor tank.

Biological trains shall be equally divided into single/multiple trains on hydraulic loading and shall be operated in parallel. Each train shall comprise of an aerobic tank.

For Nitrogen removal, bioreactor shall additionally consist of Anoxic zone of suitable size

Influent wastewater and re-circulated sludge shall be divided between all the biological trains as it enters each aerobic tank.

Biological process blowers and fine bubble diffusers in the aerobic tanks shall provide the oxygen required for the biological process as well as the mixing energy required to keep the mixed liquor in suspension. Dissolved oxygen shall be monitored in each aerobic tank to achieve a desired set point of 2 mg/L.

The mixed liquor shall overflow by gravity from the biological tanks to the membrane tanks where the solid/liquid separation takes place by means of the vacuum created by the process pumps. The permeate shall be stored in the permeate storage tank.

The mixed liquor from the end of the bioreactor aerobic zone shall proceed by gravity to the membrane filtration basins. At the outlet of each aerobic tank and inlet of each filtration basin there shall be an isolation valve. Flow shall proceed by gravity through the valve. The sluice gate valve/isolation valve can be used to either isolate of the membrane tank (i.e. during cleans). Plant demand shall be controlled by the feed flow into the system and can be trimmed by the level in the bioreactor/membrane tank.

One permeate pump per membrane train shall be employed to draw water through the membranes. Treated water shall flow from the permeate pump to the final disposal point.

Under normal operation and average day flow conditions, permeation is stopped for a specific period of time at regular intervals. This membrane relaxation period, combined with air scouring, effectively removes solids that have accumulated on the membrane surface or within the fibers and reduces electrical costs.

Same permeate pump with valving arrangement shall be provided for back pulsing the membranes.

From membrane tanks, Permeate pump shall draw treated effluent through the pores of the membrane fibers and into the back pulse tank. Once full, the treated effluent is automatically diverted away from the back pulse tank to a final disposal point. Clean

water (permeate) is suctioned through hollow fiber membranes by centrifugal permeate pumps.

The membranes shall be air scoured with required capacity of membrane aeration blowers fitted with Mechanical Variable speed drive or with pulley arrangement.

Waste activated sludge (WAS), shall be removed to the sludge handling facilities via a side stream on the discharge from the membrane tank by pumping in a controlled manner.

7.4.2 Major Process Components for MBR system

The plant shall comprise of the following major components (not limited to) :

- Coarse and fine Bar screens, Oil Removal system
- Equalization tank , Mixing system

During recovery clean, no permeate water shall be generated from the membrane train so bidder has to is assuming an equalization tank of suitable capacity to take care of the variable flow rates.

- Bioreactor feed pump
- Mechanical Fine Screen 2-3 mm (Punched Hole configuration)

Screen raw wastewater with $\leq$3 mm punch hole internally fed rotary drum screen or center flow travelling band screen or fine brush screen.

Design notes:

1 All screen openings are punch hole (dimensions in two directions). Bar or wedge wire fine screens are not acceptable.

2 Alternative screens and/or pre-treatment methods must be approved by Consultant.

- Bioreactor tank
  - Anoxic Mixer in anoxic zone (Only if Nitrogen removal required)
  - Fine bubble diffusers for aerobic tanks
  - Instruments such as DO meter
    - Biological process blowers
    - Biological process chemical feed system
    - Membrane tank with accessories for installing UF membrane

A “membrane train” is a treatment unit consisting of multiple “cassettes” that are manifolded together, installed in a concrete (i.e. membrane tank) and connected to a common permeate pump.

Within each membrane tank, the cassettes are connected to permeate header and air supply header(s). The permeate header conveys permeate from the cassettes to the permeate pump suction and also delivers cleaning solutions to the membranes. The air headers deliver air to cassette aerators for air scouring to prevent solids accumulation on the membrane surface

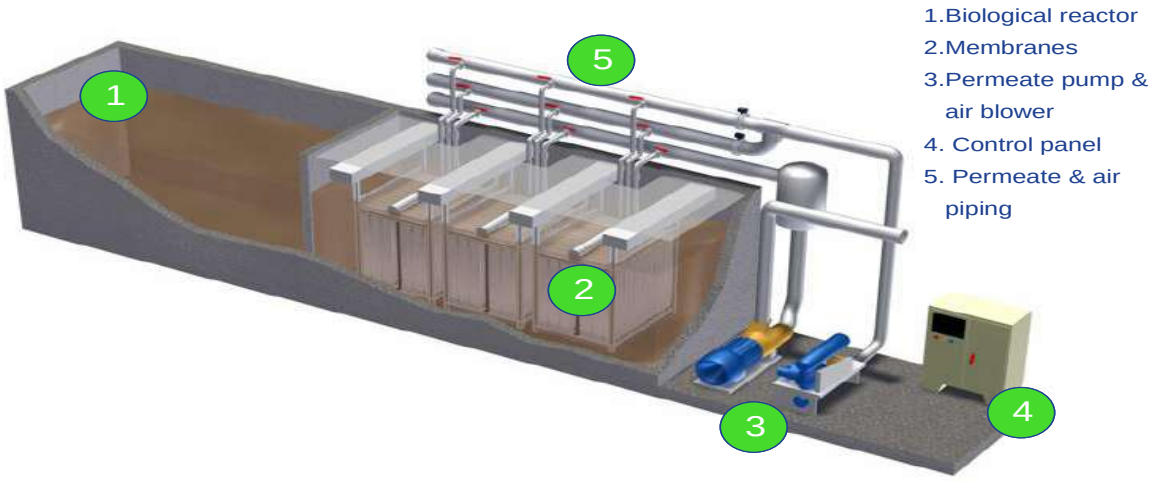
Design notes:

1. Puddle pipes inside membrane tank to be MS hot dip galvanized.
2. Membrane tank accessories required to install membranes like beams, brackets, hangers, hold pins to be minimum SS304L grade.
3. Permeate header should be SS304L (minimum) inside membrane tank and FRP, PVC, HDPE on permeate /back pulse pumps suction and discharge.

- MBR membrane

The membrane cassettes are immersed directly in the mixed liquor in the membrane tanks.

The 3D drawing above (example) shows the main components of an MBR system



- Permeate pumps/back pulse pumps (process pumps) with VFD

The membrane cassettes in each tank shall be connected to a permeate header, which in turn shall be connected to the suction of a Permeate/Back pulse Pump. This set of cassettes, the piping, and the pump is referred to as a membrane train. The vacuum generated by the Permeate Pump draws permeates from the outside in through the

membrane fibers. All Permeate/Back pulse pumps discharge into a common permeate collection header.

All the trains in the plant are operated with a repeating filtration cycle. It consists of two phases: permeation (drawing) of water through the membranes followed by a short period of reverse flow (back pulsing) or relaxation (no flow). For the proposed membrane filtration system the same pump will be used for permeate and backpulse with necessary valving arrangement

Pump parts and MOC:

Casing : CI

Impeller : CI/Br/SS

- Permeate pump priming system -Ejector system

After extended standby periods or when a train is first placed into automatic control, an automated valve which connects the top of the membrane train permeate header to an ejector (shown below) and an automated valve which connects the ejector to the Air Compressor opens. The compressed air drives the ejector to create a vacuum that draws air out of the train, pulling water through the membranes until water in the header hits a level switch. This indicates that both valves can be closed to ensure the system is primed and can be placed in operation. To simplify system control the ejector configuration consists of one unit per train and is controlled by PLC.

- Air Scour Blowers for Membrane Aeration

Whenever a membrane train is in production, membrane aeration blowers will produce the air scour required to remove solids from the membrane surface and maintain membrane permeability. A specially designed and highly efficient aeration system to be used to scour the outside surface of the membrane and move mixed liquor solids away from the membrane fibers. This shall be accomplished by a aeration system that uses a aeration grid, which is integrated into the base of each cassette. The integration of diffusers within the cassette simplifies the installation of diffusers and enhances the operation of the membrane unit.

The blowers discharge into the membrane aeration manifolds. This manifold delivers air to the membrane distribution air headers installed above each membrane tank (train).

Conventional Cyclic aeration :For optimal balance between the energy requirements of the membrane aeration blowers and the amount of air scouring provided at the membranes, the system can be designed to cycle air within each membrane cassette (10:10 mode or 10:30 mode). Each cassette is equipped with two air connections; one air connection from each cassette is connected to one of two air headers at each

membrane tank, using a flexible hose. Airflow is cycled from one train header to the other (using pneumatic valves) so that half of each cassette is aerated at a time

- Recirculation Pump (RAS pumps)
- Membrane tank Drain pump

The membrane tanks need to be drained for recovery chemical cleaning or other maintenance procedures. This can be achieved by using the above mentioned mixed liquor recirculation pumps (RAS Pumps) or separate drain pumps may be used.

- Foam Pump
- Compressor
- Sludge dewatering system
- Common membrane chemical cleaning system
- Control equipment (PLC)
- Instrumentation - Pressure Transmitters, Temperature Transmitters, Level
- Transmitters, Turbidity meter and Magnetic flow Meter
- TREATED WATER

The Sewage discharged from the MBR system will have low biological solids. The quantity of biological solids in the Sewage will depend substantially on the quantity of suspended solids and the concentration of soluble BOD entering the system. It is therefore necessary to provide means of separating the biological mass from the Sewage. The treated water after MBR shall be collected in treated water tank for onward usage in gardening and flushing

RAIN WATER HARVESTING

The storm water disposal system for the premises shall be self-sufficient to avoid any collection/stagnation and flooding of water. The amount of storm water run-off depends upon many factors such as intensity and duration of precipitation, characteristics of the tributary area and the time required for such flow to reach the drains. The drains shall be located near the carriage way along either side of the roads. Taking the advantage of road camber, the rainfall run off from roads shall flow towards the drains. Storm water from various blocks shall be connected to adjacent

drain by a pipe through catch basins. The water table becomes more than 25 m in future, rainwater harvesting can be carried out. Therefore, it has been calculated to provide 1 rain water harvesting pits at selected locations, which will catch the maximum run-off from the area.

1) Since the existing topography is congenial to surface disposal, a network of storm water pipe drains is planned adjacent to roads. All building roof water will be brought down through rain water pipes.
2) Proposed storm water system consists of pipe drain, catch basins and seepage pits at regular intervals for rain water harvesting and ground water recharging.
3) For basement parking, the rainwater from ramps will be collected in the basement storm water storage tank. This water will be pumped out to the nearest external storm water drain.
4) Annual rainfall of 731mm/yr shall be considered for designing the storm water drainage system.

Peak hourly rainfall has been considered as 90 mm/hr. The length & breadth of Recharge pit to be 4.5 m and 3 m respectively, and effective Depth = 2.7 m is constructed for recharging the water. Inside the recharge pit, a recharge bore is constructed having 300 mm diameter and 30 m depth. The bottom of the recharge structure will be kept 4 m above this level. At the bottom of the recharge well, a filter media is provided to avoid choking of the recharge bore. Design specifications of the rain water harvesting plan are as follows:

- Catchments/roofs would be accessible for regular cleaning.
- The roof will have smooth, hard and dense surface which is less likely to be damaged allowing release of material into the water. Roof painting has been avoided since most paints contain toxic substances and may peel off.
- All gutter ends will be fitted with a wire mesh screen and a first flush device would be installed. Most of the debris carried by the water from the rooftop like leaves, plastic bags and paper pieces will get arrested by the mesh at the terrace outlet and to prevent contamination by ensuring that the runoff from the first 10-20 minutes of rainfall is flushed off.
- No sewage or wastewater would be admitted into the system.
- No wastewater from areas likely to have oil, grease, or other pollutants has been connected to the system.

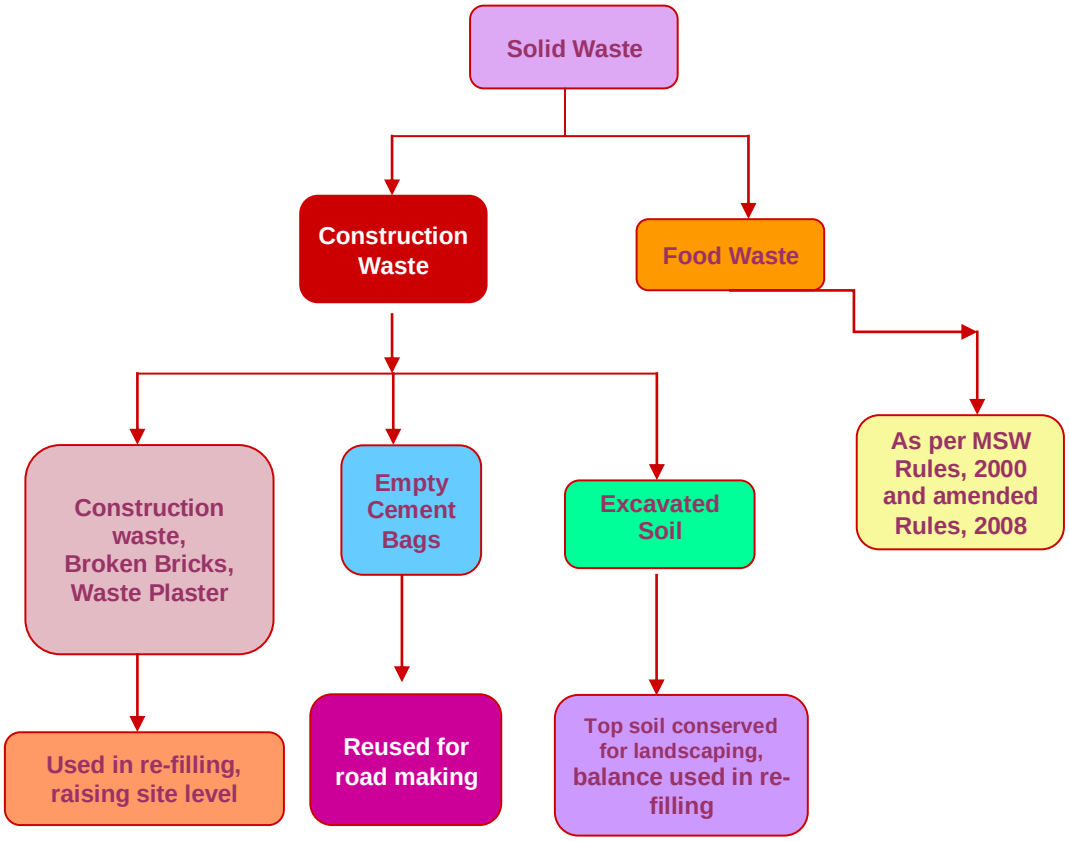
Calculations for storm water load

COMPUTATION FOR RAIN WATER HARVESTING PIT		
Total coverage area	1896.7	sq mt (approx).
Average Run off coefficient for roof top	90%	percent
Peak Intensity of Runoff (assumed for provisioning Harvesting pit)	90	mm/hr
Run off from site	154	cum/hr
15 min retention (as per CPWD norms)	38	cum/hr
Size of each Harvesting Pit provided		
(can be varied to suit the landscape)		
Length	4.5	m approx.
Width	3	m approx.
Depth (effective depth)	2.7	m approx.
Volumetric capacity of Harvesting Pit	36.45	cum
Volumetric capacity of De-silting Chamber	2	cum
Volumetric capacity of Harvesting Pit + De-silting Chamber	39	cum
Harvesting pit Required	**1.0**	**Nos.**
Harvesting pit Provided Say	**1.0**	**Nos.**

SOLID WASTE GENERATION

Solid waste would be generated both during the construction as well as during the operation phase. The solid waste expected to be generated during the construction phase will comprise of excavated materials, used bags, bricks, concrete, MS rods, tiles, wood etc. The following steps are proposed to be followed for the management of solid waste:

- Construction yards are proposed for storage of construction materials.
- The excavated material such as topsoil and stones will be stacked for reuse during later stages of construction.
- Excavated top soil will be stored in temporary constructed soil bank and will be reused for landscaping of the residential group housing project.
- Remaining soil shall be utilized for refilling / road work / rising of site level at locations/ selling to outside agency for construction of roads etc.



Figure

Solid Waste Management Scheme (Construction Phase)

During the operation phase, waste will comprise domestic as well as agricultural waste. The solid waste generated from the project shall be mainly domestic waste and estimated quantity of the waste shall be approx. @ 0.5 kg per capita per day for residents, @ 0.15 kg per capita per day for the commercial, 0.25 kg per capita per day for the staff members and landscape wastes @ 15 kg/acre/day). Following arrangements will be made at the site in accordance to Municipal Solid Wastes (Management and Handling) Rules, 2000 and amended Rules, 2008.

Table 4: Calculation of Solid Waste Generation

S. No.	Category	kg per capita per day	Waste generated (kg/day)
1.	Staff	101 @ 0.25 kg/day	25.25
2.	Guest Room	320 @ 0.5 kg/day	160
3.	Commercial	3021 @ 0.15 kg/day	453.15
3.	Landscape waste	0.060 acre @ 15 kg/acre/day	0.91
	TOTAL SOLID WASTE GENERATED		**639.3 kg/day**

(Source: For Waste Collection, Chapter 3, Table 3.6, Page no. 49, Central Public Health & Environment Engineering Organization, Ministry of Urban Development, (Government of India, May 2000))

❖ **Collection and Segregation of waste**

1. A door to door collection system will be provided for collection of domestic waste in colored bins from household units.
2. The local vendors will be hired to provide separate colored bins for dry recyclables and Bio-Degradable waste.
3. Litter bin will also be provided in open areas like parks etc.

❖ **Treatment of waste**

- Bio-Degradable wastes

1. Bio-degradable waste will be subjected to organic waste convertor and the compost will be used as manure.
2. STP sludge is proposed to be used for horticultural purposes as manure.
3. Horticultural Waste is proposed to be composted and will be used for gardening purposes.

- Recyclable wastes

i. *Grass Recycling* – The cropped grass will be spread on the green area. It will act as manure after decomposition.

ii. Recyclable wastes like paper, plastic, metals etc. will be sold off to recyclables.

❖ **Disposal**

Recyclable and non-recyclable wastes will be disposed through Govt. approved agency. Hence, the Municipal Solid Waste Management will be conducted as per the guidelines of Municipal Solid Wastes (Management and Handling) Rules, 2000 and amended Rules, 2008. A Solid waste management Scheme is depicted in the following figure for the residential project.

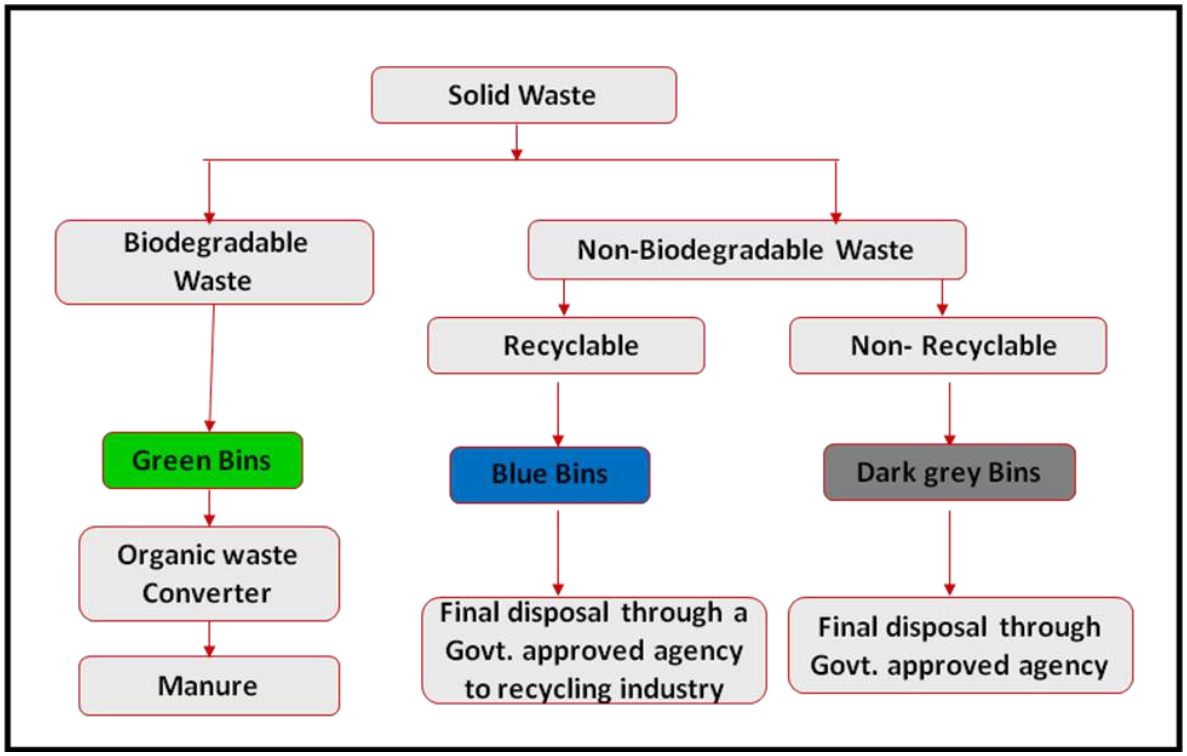


Figure 5: Solid Waste Management Scheme (Operation Phase)

ELECTRICAL

4.1 SOURCE OF POWER:

As per UPPCL norms power shall be supplied at 433 Volts if total load of the complex is less than 50 KW. If load is more than 50 KW and less than 4 MVA power shall be supplied at 11 KV. If load is more than 4 MVA and less than 20 MVA power shall be supplied at 33 KV. As the total demand load required is **2039 KVA**, hence single point connection at 11 KV shall be taken from UPPCL. The power shall be terminated in 11KV metering room comprising 11 KV meter and 11 KV VCB for isolation for each.

4.2 ELECTRICITY TARRIFF SYSTEM:-

Owner shall pay to UPPCL electricity charges on the basis of readings in 11 KV meter in addition to the fixed charges as per the norms as it will be a bulk supply connection. Owner shall in turn collect electricity charges from the tenants with the help of Energy Management Software which will be used for generating electricity bill for each tenant based on the energy consumption for Lighting, Power, A/C, adjustment of Common Area charges. The software shall have the capability to take in to account the dual tariff (Grid Supply & DG Supply). The software shall have the capability to take the 11 KV meter readings, subtract from these readings the individual readings of all the energy meters and adjust this energy difference amount on to the bills of tenants based on their areas.

4.3 SELECTION OF SIZE OF TRANSFORMER:-

The 11 KV power received shall be stepped down to 433 Volts which is the operating voltage, by installing 11 KV/433 Volt Transformer. As per the calculations enclosed in the report the total transformer capacity required is 2039 KVA, for which there will be one Substation comprising 11 KV VCB Panel, **Two nos. 1000 KVA** oil filled type Transformer.
The Transformer shall be ONAN type as it is proposed to being installed in open.

4.4 STAND BY POWER GENERATION: -

As per load calculations enclosed in the report in total DG capacity required is 1709 KVA for which it is recommended to provide 1 no. 750 KVA and 1 no. 1010 KVA DG Set considering almost 75% power backup for entire complex.

It is proposed to provide DG Sets with Power Command Centre (PCC) for AMF & Auto synchronizing function. Separately PLC based Auto Load Management system shall be provided which will function in coordination with Power Command Centre provided in each DG Set.

DG sets shall be provided outside in Acoustic Enclosure and exhaust pipes as per CPCB norms and shall be radiator cooled.

ELECTRICAL LOAD SHEET						
A	**DESCRIPTION OF FLOORS**	**PARKING SQ.MTR**	**WATT/ SQ.MTR**	**LOAD IN KW**	**DIVERSITY %**	**TOTAL LOAD IN KW**
1	3RD BASEMENT FLOOR	2854.45	15	42.82	80%	34.25
2	2ND BASEMENT FLOOR	2854.45	15	42.82	80%	34.25
3	LOWER GROUND FLOOR	742.51	15	11.14	80%	8.91
	TOTAL (A)			**42.82**		**77.42**
B	**DESCRIPTION OF FLOORS**	**COMMERCIAL SQ.MTR**	**WATT/ SQ.MTR**	**LOAD IN KW**	**DIVERSITY %**	**TOTAL LOAD IN KW**
1	LOWER GROUND FLOOR	1405.96	150	210.89	75%	158.17
2	UPPER GROUND FLOOR	1813.35	150	272.00	75%	204.00
3	FIRST FLOOR	1758.6	150	263.79	75%	197.84
4	SECOND FLOOR	1758.6	150	263.79	75%	197.84
	TOTAL (B)			**746.69**		**757.86**
C	**DESCRIPTION OF FLOORS**	**HOTEL/ APARTMENT SQ.MTR**	**WATT/ SQ.MTR**	**LOAD IN KW**	**DIVERSITY %**	**TOTAL LOAD IN KW**
1	FOURTH FLOOR	1102.6	150	165.39	75%	124.04
2	FIFTH FLOOR	1102.6	150	165.39	75%	124.04
3	SIXTH FLOOR	1102.6	150	165.39	75%	124.04
4	SEVENTH FLOOR	1050.98	150	157.65	75%	118.24
5	EIGHTH FLOOR	773.6	150	116.04	75%	87.03
	TOTAL (C)			**653.82**		**577.39**
D	**DESCRIPTION OF FLOORS**	**SERVICE SQ.MTR**	**WATT/ SQ.MTR**	**LOAD IN KW**	**DIVERSITY %**	**TOTAL LOAD IN KW**
1	3RD/SERVICE FLOOR	1758.6	5	8.79	75%	6.59
2	MACHINE ROOM/MUMTY	98.55	5	0.49	75%	0.37
	TOTAL (D)			**9.29**		**6.96**
E	**COMMON SERVICES**					
1	LIFT (6NOS) @12KW EACH			72	80%	57.60
2	FIRE FIGHTING			125	10%	12.50
3	PLUMBING			25	80%	20.00
4	STP			25	80%	20.00

5	EXTERNAL LIGHTING			15	80%	12.00
6	COMMON AREA LIGHTING			10	80%	8.00
	TOTAL (E)			**272.00**		**130.10**
	GRAND TOTAL					1550.KW

TRANSFORMER SELECTION

Transformer Capacity Considering 0.95 Power Factor **1631.KVA**

Transformer Capacity Considering 80% Loading **2039.KVA**

Transformer Capacity 2 No. 1000KVA 11KV/.433 KV Oil filled type Transformer

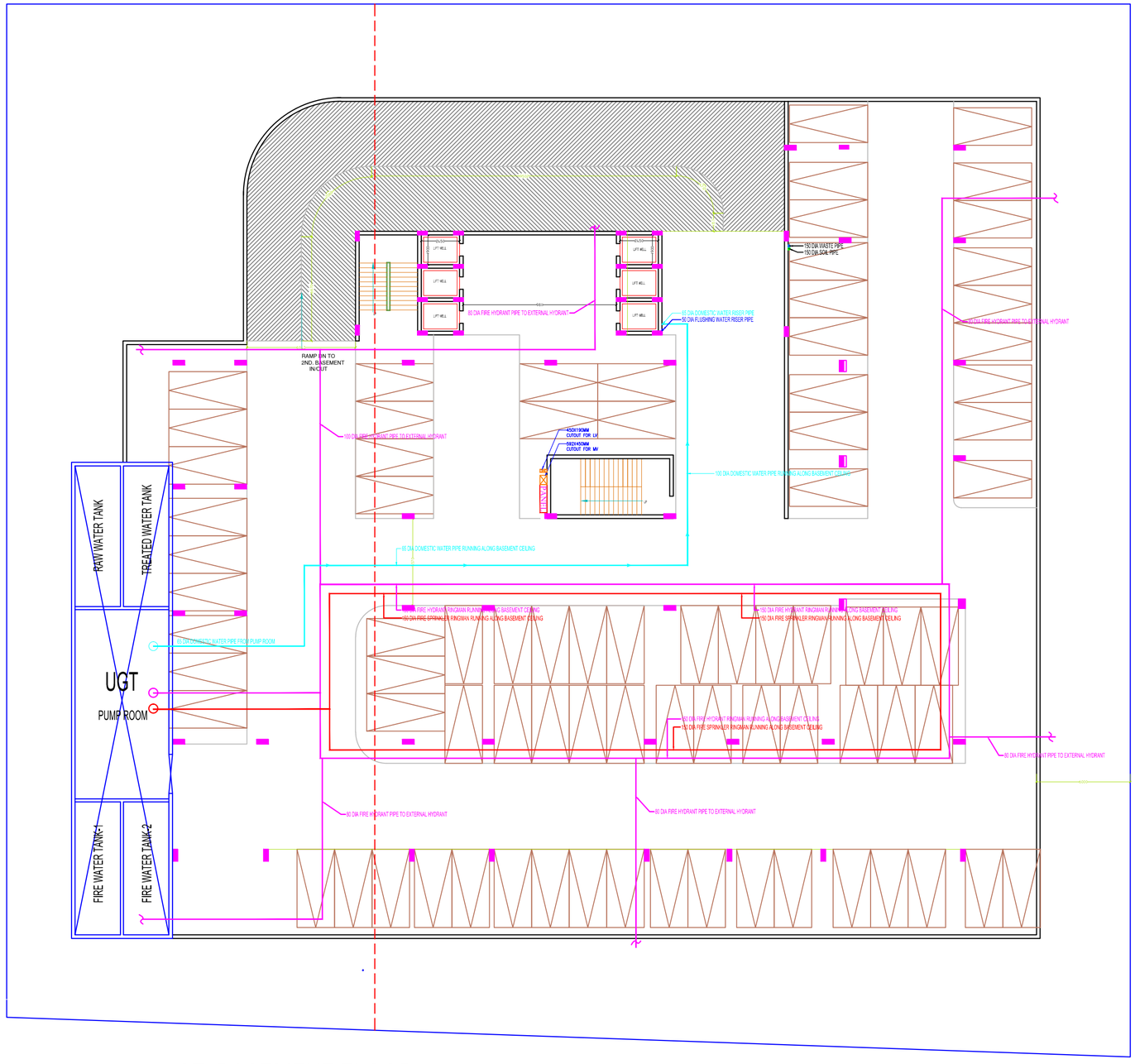
D.G. SET SELECTION

OVERALL DIVERSITY 75% 1162.KW

D.G. SET Capacity Considering 0.8 Power Factor **1453.KVA**

D.G. SET Capacity Considering 85% Loading **1709.KVA**

D.G. SET Capacity 1 No. 750KVA & 1 No. 1010KVA



1ST. BASEMENT FLOOR

PROJECT–

PROPOSED HOTEL (NON STAR)
BUILDING KHASRA NO. 1128(M)
NOOR NAGAR, GHAZIABAD (U.P.)

BUILDERS & PROMOTER:-

AVS INDIA INFRA PVT LTD

DRAWING TITLE :-

1st BASEMENT PLUMBING LAYOUT

OWNER SIGN | ARCHITECT SIGN

ARCHITECTS & PLANNERS
SINGLA ARCHITECTS & ASSOCIATES
EIKON MARKET PLACE, PLOT NO. 02, SHOP - 07 1ST. FLOOR
SHAKTI KHAND – 2, INDIRAPURAM, GHAZIABAD (U.P.)
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MEP Consultant:
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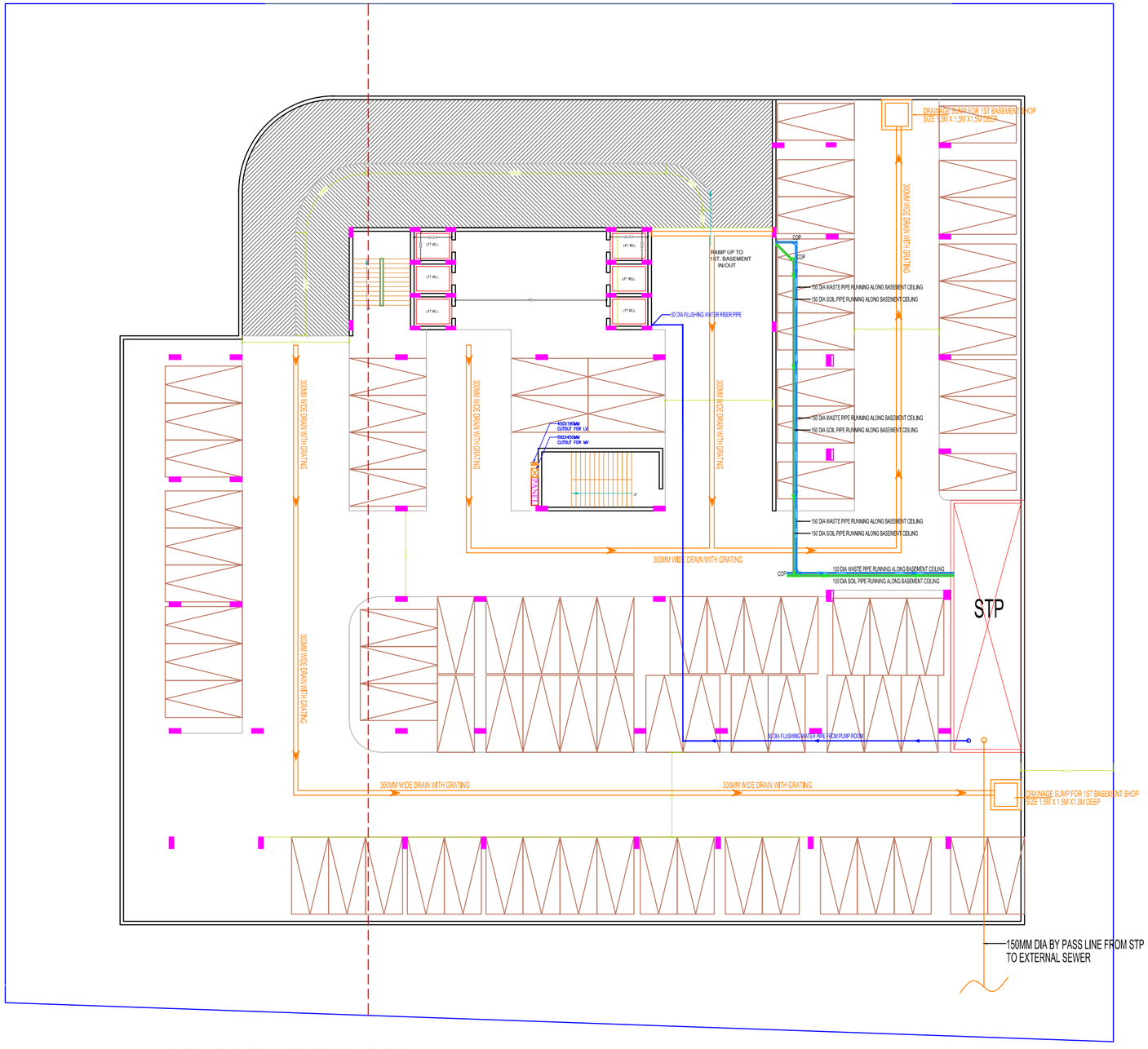
Email:- wedesignconsultancy@gmail.com
Mob. - 9999288416, 9999288407, 9882244495

DEALT BY:-	CHECKED BY:-	SCALE:-	DATE:-	DRG. No.:-
VBSHOR	DINESH	NTS		02



2ND. BASEMENT FLOOR

PROJECT–

PROPOSED HOTEL (NON STAR)
BUILDING KHASRA NO. 1128(M)
NOOR NAGAR, GHAZIABAD (U.P)

BUILDERS & PROMOTER:-

AVS INDIA INFRA PVT LTD

DRAWING TITLE :-

2nd BASEMENT DRAINAGE LAYOUT

OWNER SIGN	ARCHITECT SIGN

ARCHITECTS & PLANNERS :
SINGLA ARCHITECTS & ASSOCIATES
EROS MARKET PLACE, PLOT NO- 02, SHOP - 87 1ST. FLOOR
SHAKTI KHAND - 2, INDIRAPURAM, GHAZIABAD (U.P.)
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MEP Consultant:
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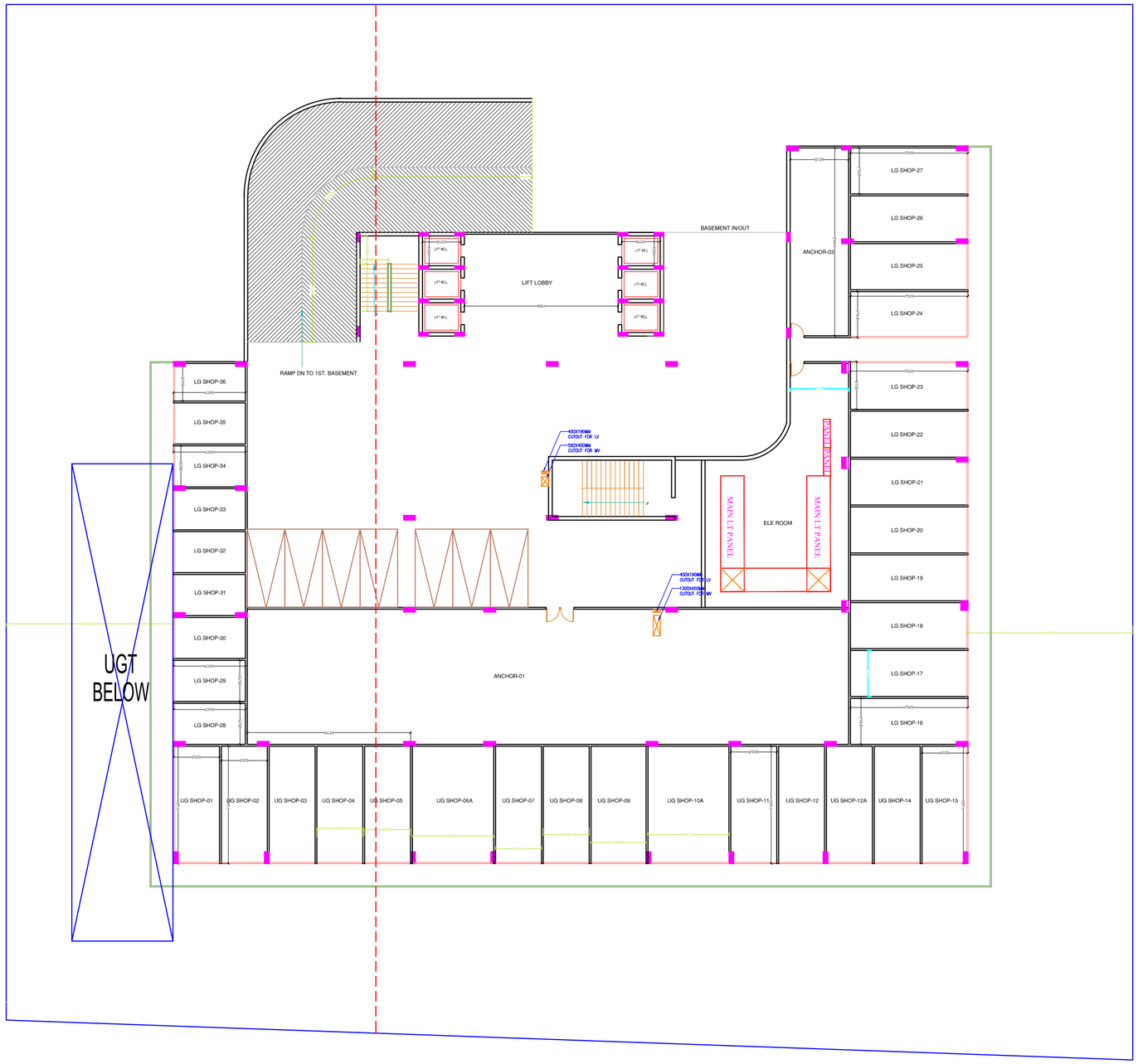
DEALT BY:-	CHECKED BY:-	SCALE:-	DATE:-	DRG. NO.:-
VIBHOR	DINESH	NTS		01



BASEMENT PLAN

PROJECT–

PROPOSED HOTEL (NON STAR)
BUILDING KHASRA NO. 1128(M)
NOOR NAGAR, GHAZIABAD (U.P)

BUILDERS & PROMOTER:-

AVS INDIA INFRA PVT LTD

DRAWING TITLE :-

BASEMENT LAYOUT

OWNER SIGN | ARCHITECT SIGN

ARCHITECTS & PLANNERS:

SINGLA ARCHITECTS & ASSOCIATES

EROS MARKET PLACE, PLOT NO- 02, SHOP - 87 1ST. FLOOR
SHAKTI KHAND - 2, INDIRAPURAM, GHAZIABAD (U.P.)
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e-mail : gsingh32@gmail.com,

MEP Consultant:

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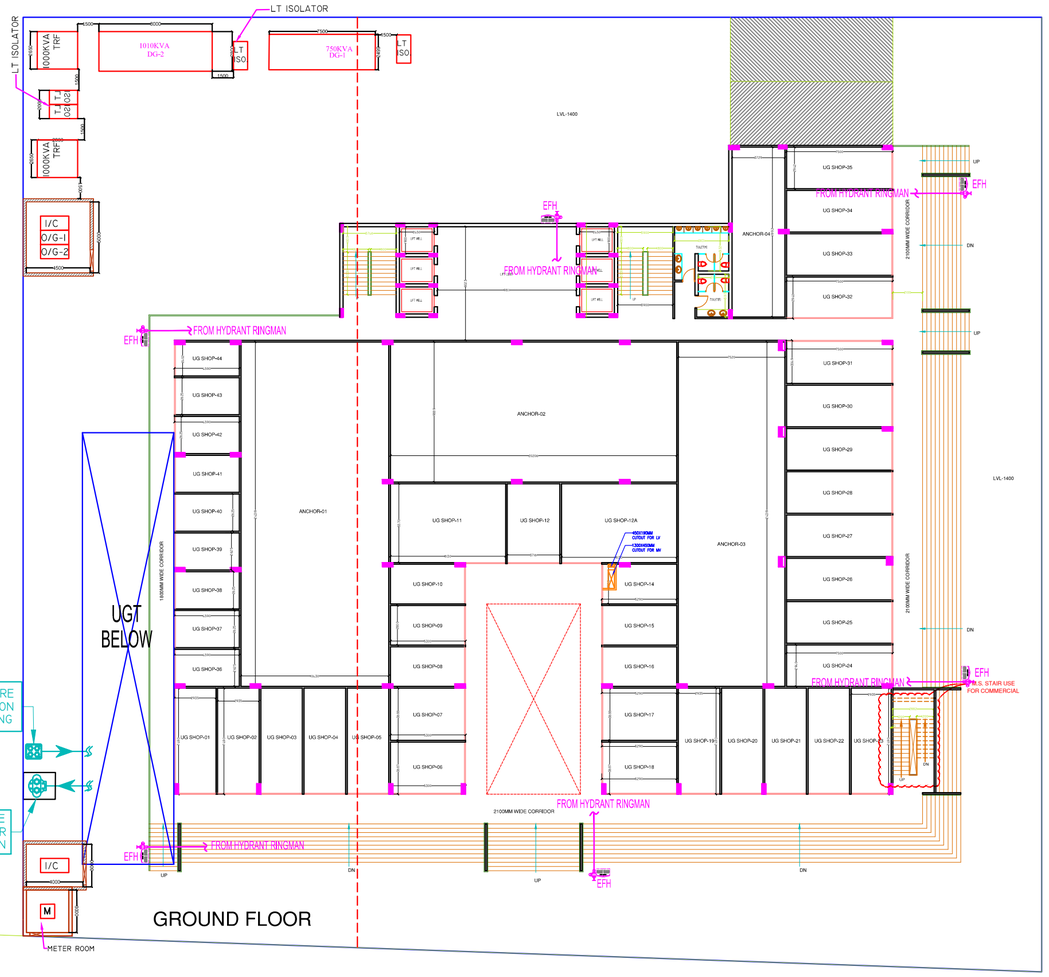
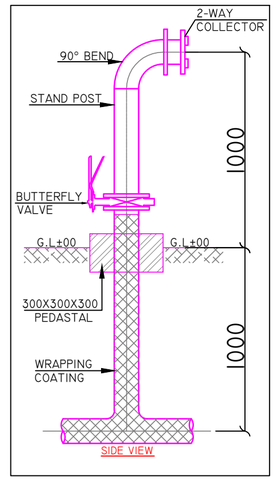
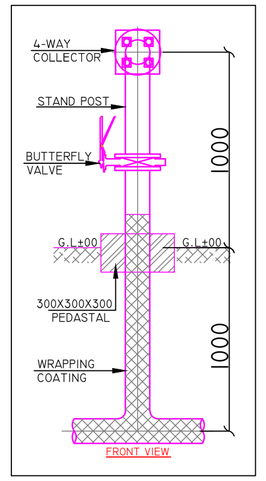
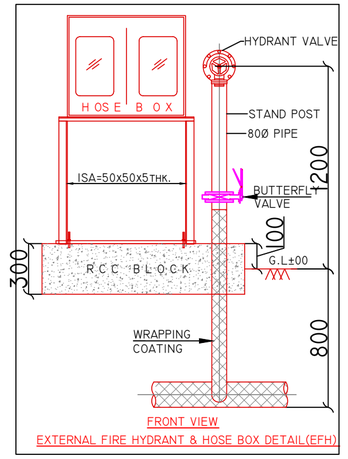
Mob:- 9999288416, 9999288407, 9882244495

DEALT BY:-	CHECKED BY:-	SCALE:-	DATE:-	DRG. No :-
VIBHOR	DINESH	NTS		03









S.NO.	LEGEND:-	
1.	EXTERNAL FIRE HYDRANT LINE	
2.	INTERNAL FIRE HYDRANT LINE	
3.	EXTERNAL FIRE HYDRANT	EFH
4.	4-WAY FIRE BRIGADE INLET CONNECTION	
5.	2WAY FIRE BRIGADE CONNECTION	

PROJECT–

PROPOSED HOTEL (NON STAR)
BUILDING KHASRA NO. 1128(M)
NOOR NAGAR, GHAZIABAD (U.P)

BUILDERS & PROMOTER:-

AVS INDIA INFRA PVT LTD

DRAWING TITLE :-

EXTERNAL FIRE LAYOUT PLAN

OWNER SIGN | ARCHITECT SIGN

ARCHITECTS & PLANNERS :
SINGLA ARCHITECTS & ASSOCIATES
EROS MARKET PLACE, PLOT NO- 02, SHOP - 87 1ST. FLOOR
SHAKTI KHAND - 2, INDIRAPURAM, GHAZIABAD (U.P.)
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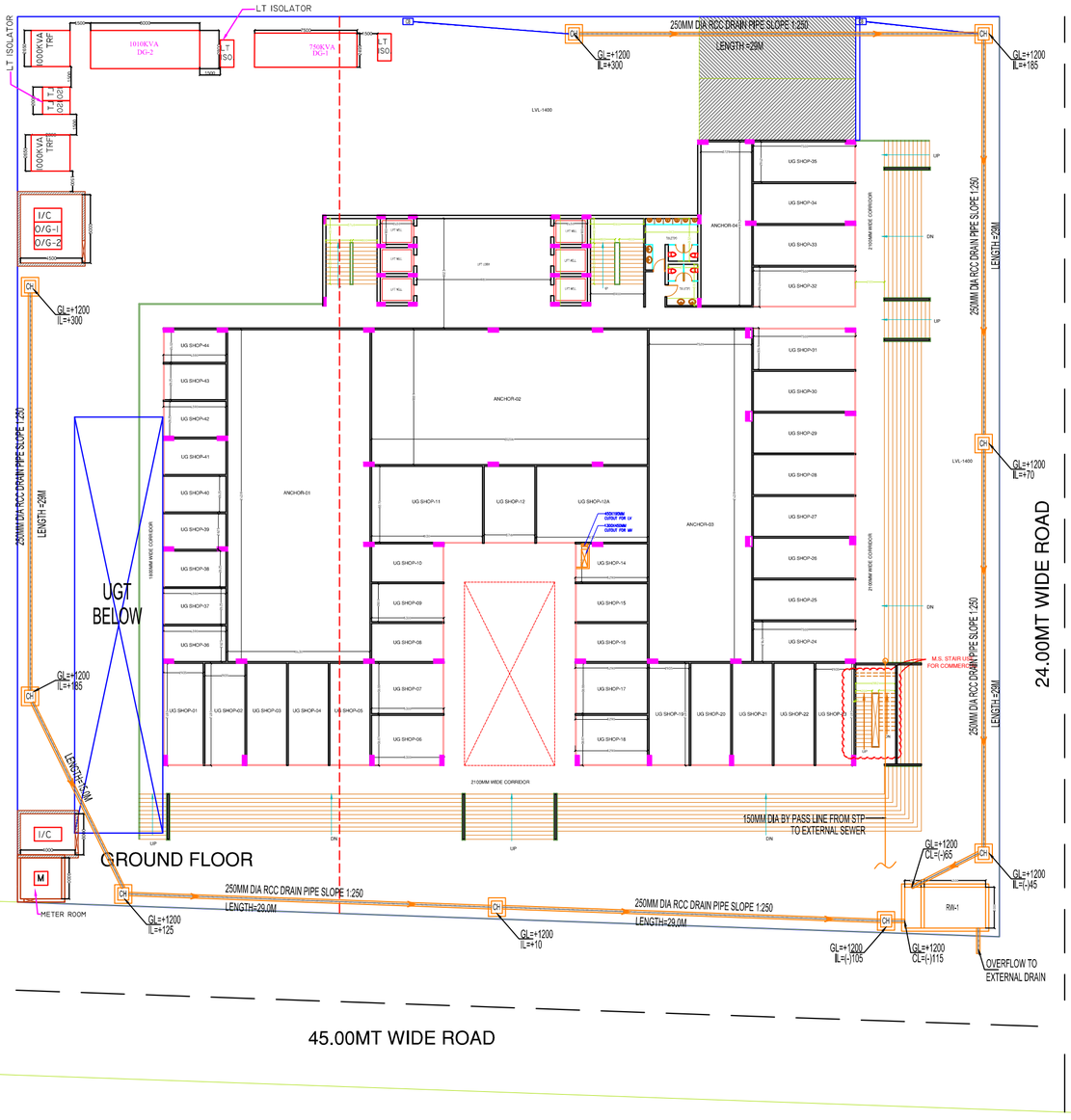
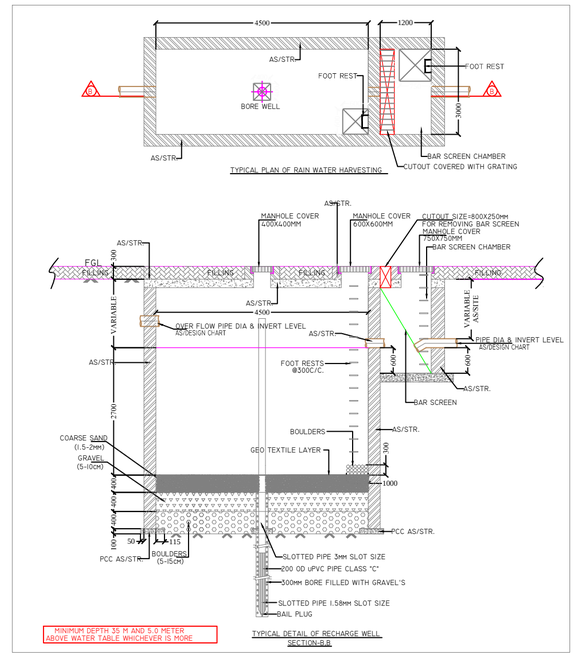
VISHOR	DINESH	NTS		05

S.NO.	LEGEND:-	
1.	EXTERNAL DRAINAGE PIPE	
2.	CATCH BASIN 450 X 450MM	CB
3.	MANHOLE SIZE 800 X0900MM	CH
4.	RECHARGE WELL	RW





PROJECT–

PROPOSED HOTEL (NON STAR)
BUILDING KHASRA NO. 1128(M)
NOOR NAGAR, GHAZIABAD (U.P)

BUILDERS & PROMOTER:-

AVS INDIA INFRA PVT LTD

DRAWING TITLE :-

EXTERNAL PLUMBING LAYOUT PLAN

OWNER SIGN | ARCHITECT SIGN

ARCHITECTS & PLANNERS :
SINGLA ARCHITECTS & ASSOCIATES
EROS MARKET PLACE, PLOT NO- 02, SHOP - 87 1ST. FLOOR
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DEALT BY:-	CHECKED BY:-	SCALE:-	DATE:-	DRG. No.:-
VIBHOR	DINESH	NTS		04