Description of the Work

Construction ,Supplying of Electro Mechanical equipment, pipe fittings, erection, installation, testing and commissioning MBBR technology Sewage Treatment Plant **(Capacity 300 KLD)** at kh.no.54,city survey no.173 layout plan near sheshnagar,middle ring road,mouza-wathoda.

1. DESIGN BASIS & PERFORMANCE PROJECTION

A) DESIGN BASIS:

The Sewage Treatment plant has been designed on the basis of following input parameters;

INLET PARAMETERS:

Domestic Sewage Parameters As per CPCB & MPCB

B) PERFORMANCE PROJECTION:

OUTLET PARAMETERS:

SR. NO.	PARAMETER	UNIT	RESULTS
1.	Flow	Cum/day	300
2.	pH	SU	7.0 – 8.0
3.	COD	mg/l	<100
4.	BOD	mg/l	< 30
5.	TSS	mg/l	< 100
6.	O & G	mg/l	<10

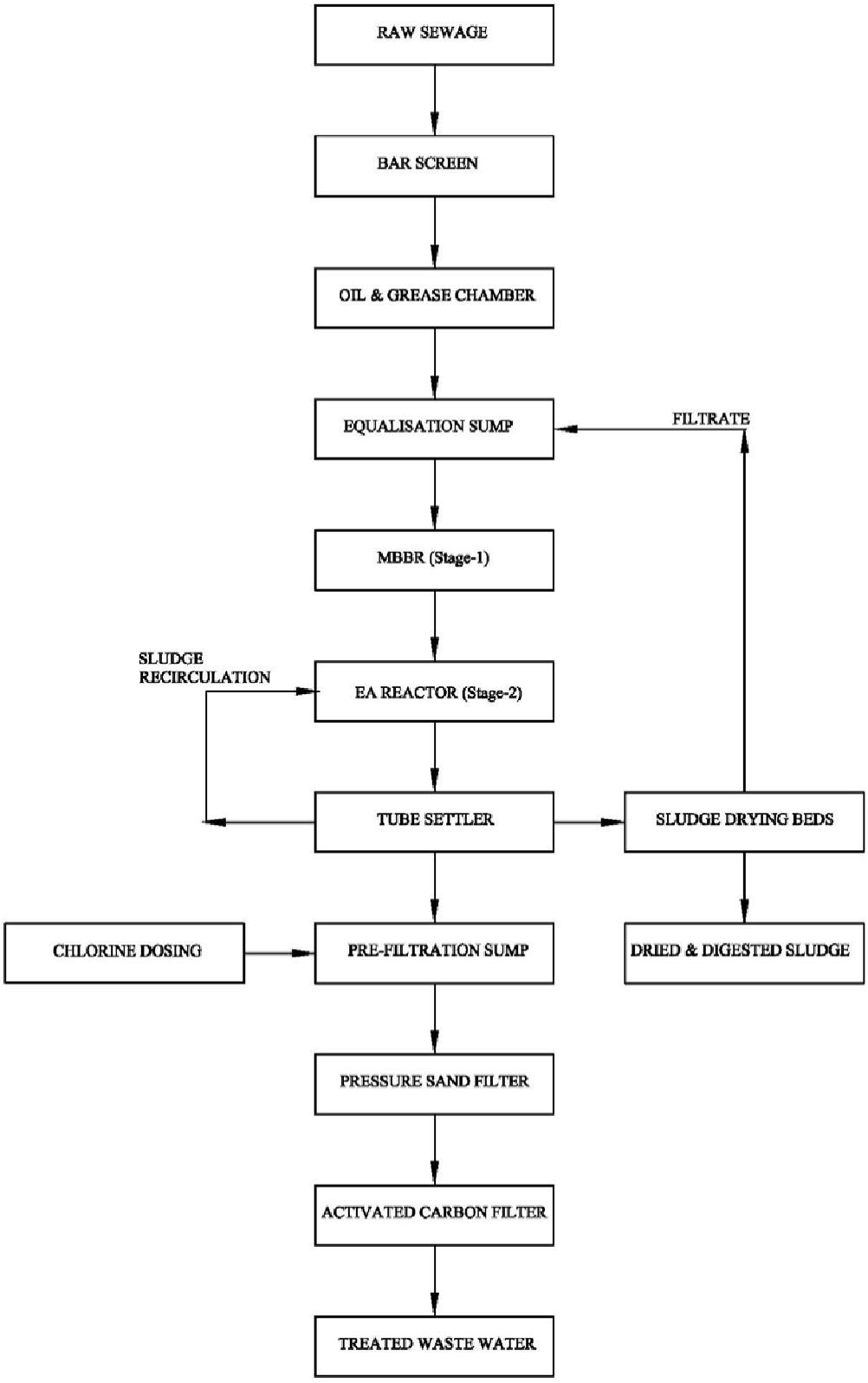
2. TREATMENT PROCESS

This **Sewage Treatment Plant** has specifically been designed for the purpose of treatment of Domestic Waste Water Discharge before its disposal to bring the characteristics of the same upto acceptable norms and standards.

Waste Water is stored in an **Equalization cum Storage Sump**. From here it is lifted with the help of a **Raw Effluent Lift Pump** to a two stage Aerobic Reactor. First stage of the same is an attached growth based **MBBR (Moving Bed Biological Reactor).** Here Bacteria Culture develops on Floating MEDIA CYLINDERS. These micro-organisms derive their food from the organic impurities in water and air from an **Air Blower** which diffuses air in Fine Bubble Form at the bottom of the reactor through **Membrane Diffusers**. This reduces the BOD Load of the Discharge significantly. The water is further fed to **EA Reactor** which is a suspended growth type aerobic reactor. Here BOD/COD load is reduced further.

Water from here is fed to a **Tube Settler** where finer suspended impurities as well as dead organic matter from the MBBR is settled and dumped to **Sludge Beds** where it is sun–dried (or to **Sludge Tank**, where it is dewatered using a **Filter Press**). Part of the sludge is recycled using a **Sludge Recycling Pump**.

Water after Tube Settler is stored in **Pre-filtration Sump** and is pumped through a **Filtration Pump** to a set of **Pressure Sand & Activated Carbon Filters.** They remove very fine suspended particles in the Discharge Stream, as well as traces of any impurity or any odour or colour inherent in the stream. BOD and COD of water is further reduced during Filtration. Further, before filtration the water is **disinfected** using Sodium hypochlorite based dosing, before final disposal of treated water.


RAW SEWAGE
BAR SCREEN
OIL & GREASE CHAMBER
EQUALISATION SUMP
FILTRATE
MBBR (Stage-1)
SLUDGE
RECIRCULATION
EA REACTOR (Stage-2)
TUBE SETTLER
SLUDGE DRYING BEDS
CHLORINE DOSING
PRE-FILTRATION SUMP
DRIED & DIGESTED SLUDGE
PRESSURE SAND FILTER
ACTIVATED CARBON FILTER
TREATED WASTE WATER

3. SCOPE OF WORK

1. All civil works related to STP as per **Annexure – I ,II and Technical Specification** including Pipes Inserts, hydraulic testing of all civil units, waterproofing of civil units in case of leakages found during the hydraulic testing.
2. Fabrication of Railing, platforms, ladders, pipe supports with foundation, and steel material required for the same.
3. All consumable and chemicals required during commissioning of the STP, like Urea, DAP, and cow dung etc.
4. Manpower required during the commissioning and operation of the STP, like three operators in three shifts and unskilled labor in general shift.
5. Unloading, safe storage at site, and security of all the electro-mechanical equipments.
6. Sludge disposal from STP site.
7. Operation & Maintenance (O& M) of STP as per the **Annexure – III**

4. BATTERY LIMITS

Entry Point : - Screen Chamber
Exit Point : - Treated Water Tank
Sludge: -Sludge Drying Bed
Power Supply: - To M.C.C.

ANNEXURE I
LIST OF CIVIL UNITS

SR. NO.	CIVIL TANKS	QTY.	VOL. M^3	SIZES	MOC
1.	Screen Chamber	1 No.	2.78	1.18m x 1.18m x 2.m SWD	RCC M-30
2.	Oil & Grease Trap	2 No.	2.78	1.18m x 1.18m x 2.m SWD	RCC M-30
3.	Storage Tank	1 No.	90	4m x 7.5m x 3m SWD	RCC M-30
4.	MBBR Tank	1 No.	63	3.5m x 4m x 4.5m SWD	RCC M-30
5.	EA Reactor	1 No.	63	3.5m x 4m x 4.5m SWD	RCC M-30
6.	Filtration Tank	1 No.	48	4 m x 4 m x 3m SWD	RCC M-30
7.	Sludge Bed	3 No.	1.72	1.2m x 1.2m x 1.2m SWD	
8.	Sludge Drying platform	1 No.	-	-	RCC M-30
9.	Construction of MCC Room/Lab Room/Store Room/Machine Room with internal & external electrification & necessary sanitary arrangement and fittings, in RCC framed structure. Height 3.2 meters, providing ladder doors & windows as per drawing of built up area 46 sq. meters.	1 No.	-		RCC M-30
10.	Foundation for Blowers, Pumps, PSF, ACF, Panel etc.	1 Lot.	-		PCC
11.	Construction of 150mm diameter bore well upto depth of 100 meters including casing pipe (PVC/MS) as per requirement including submersible pump 3HP including all necessary fittings.	1 No.	-		RCCM-30

ANNEXURE II
LIST OF ELECTRO-MECHANICAL EQUIPMENTS

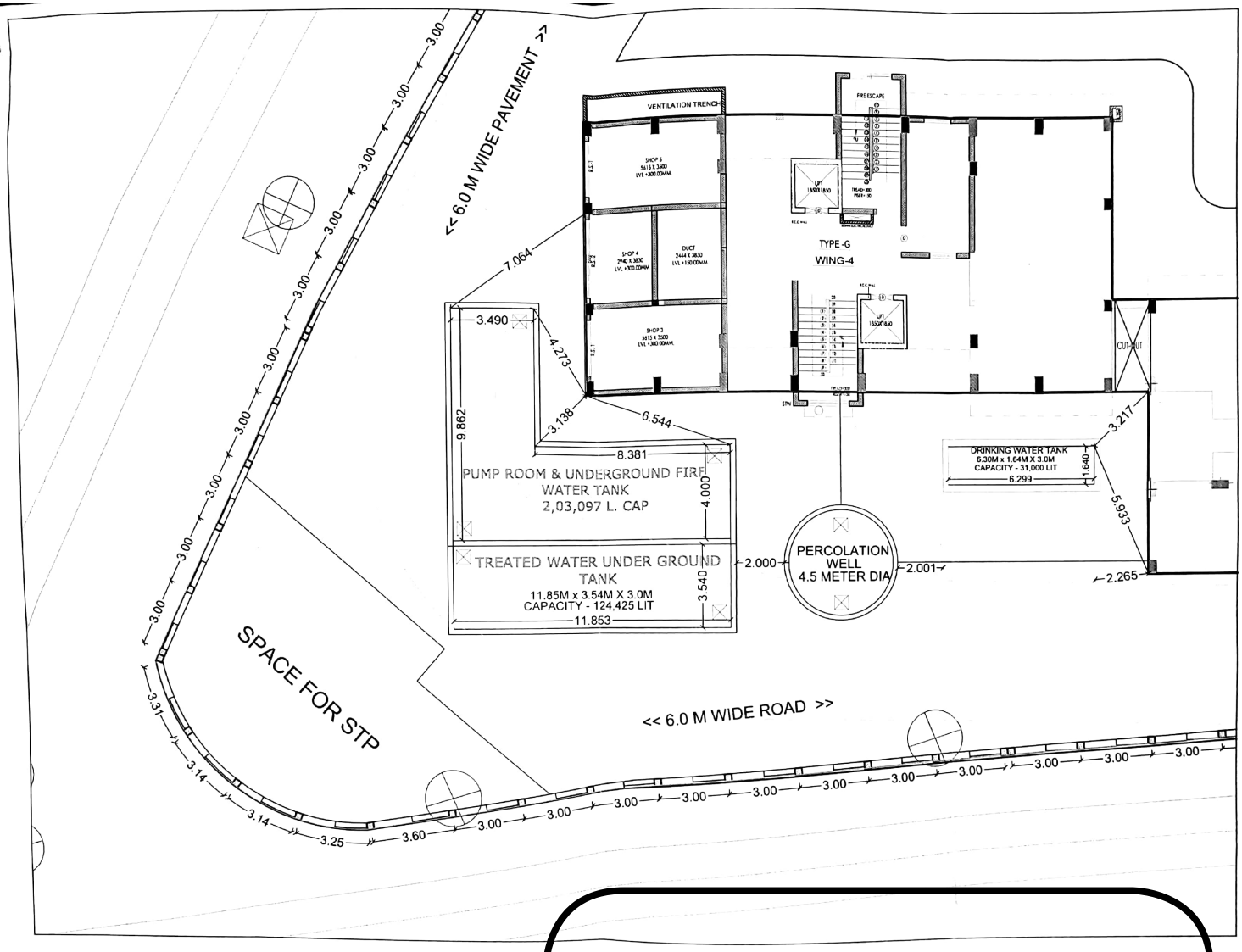
Sr. No.	EQUIPMENT LIST	QTY.
1.	Coarse Bar Screen	1 No.
2.	Submersible Pump for Collection cum Equalization Tank	2 Nos.
3.	Blower For MBBR Tank & EA Reactor	2 Nos.
4.	Diffusers For MBBR Tank & EA Reactor	1 Lot.
5.	Media for MBBR Tank	1 Lot.
6.	Secondary Clarifier Mechanism	1 No.
7.	Sludge Recirculation Pump	2 Nos.
8.	Feed Pump For Pressure Sand Filter	2 Nos.
9.	Pressure Sand Filter (PSF)	1 No.
10.	Activated Carbon Filter (ACF)	1 No.
11.	Media for PSF & ACF	1 Lot.
12.	Pipes, Pipe fittings like flanges, tees, bends, nut bolts, gaskets etc.	1 Set.
13.	Valves	1 Lot.
14.	Inserts & Nozzles	1 Lot.
15.	MCC Panel, Electrical Cables & its Accessories	1 Lot.

TECHNICAL SPECIFICATIONS

Sr. No.	EQUIPMENT SPECIFICATIONS	
1.	**BAR SCREEN**	
	Civil tank size	2.0 m x 1.0 m x 0.75 m SWD + 0.5 m FB
	No. Of Tank	1 No.
	Purpose	Screening of Wastewater
	Type	Bar Type
	MOC	SS 304
	Flow	25.0 m3/hr
	Opening	10 mm
	Quantity	1 No.
	Make	Fabricated
2.	**SUBMERSIBLE PUMPS FOR COLLECTION CUM EQUALIZATION TANK**	
	No. Of Tank	2 Nos. (1W + 1 SB)
	Type	Vertical, Submersible
	Purpose	To transfer raw effluent from collection cum equalization tank to grit chamber
	MOC	SS 304
	Flow	12.5m3/hr, 15 m head
	Quantity	2 nos. (1W + 1SB)
	Make	Kirloskar /CRI /Eq.
4.	**BLOWER FOR MBBR AERATION TANK**	
	Type	Roots, Twin lobe
	Material	Cast Iron
	Capacity	215m3/hour
	Qty.	2 Nos. (1 W + 1 SB)
	Pressure Drop	0.45 KGs./cm^2
	Make	Everest/Kay/Eq.
	MOTOR	
	Type	Horizontal, TEFC, Squirrel Cage, Induction
	Capacity	10.0 HP
	Qty.	2 No. (1 W + 1 SB)
	Make	SIEMENS IEE2/ABB/Eq.
8.	**DIFFUSERS FOR MBBR TANK**	
	Purpose	Supply of oxygen for biological oxidation of organic matter and for proper mixing for Aerobic treatment as per process design requirement.
	Material	Silicon based membrane with anti-microbial properties PP support tube 4.5 mm thick
	Type	Fine bubble air diffuser – Tubular (Retrievable Type)
	Size	63 mm O.D, 2.0 mts. long Pipe aerator density approx. 12%.
	Air Quantity	8-10 m3 air /mtr
	Qty.	1 Lot.
	Make	OTT /Rehau/Equivalent

9.	**MEDIA FOR MBBR TANK**	
	MOC	PP Media
	Surface Area per m3	13.5 m3
	Qty.	1 Lot
	Make	Cooldeck/Guddiplast/MM Aqua/Eq.
10.	**SECONDARY CLARIFIER MECHANISM**	
	Type	• Conical Bottom with sludge drain valve • -Supporting Structure of ISMC 75x40 and 10.0mm Thk. Base Plates and Brackets. • -Fastening of Flat 50x8 and ISMA 50x6 • -Epoxy Coated from inside
	MOC	Construction: 5mm Thk
	Size	3.3 m x 2.5 m x 2.1 m
	Make	Fabricated
11.	**SLUDGE RECIRCULATION PUMP**	
	Type	Centrifugal, Non-clog, self-priming
	Material	Body-Cast Iron, impeller – SS
	Capacity	2.0 m3/hour @ 10 m head or recommended by the supplier
	Qty.	2 no. (1 W + 1 SB)
	Make	Johnson/Kirloskar/Eq.
	Motor	
	Type	Horizontal, TEFC, Squirrel Cage, Induction
	Capacity	1 HP or recommended by the supplier
	Make	SIEMENS IEE2/ABB/Eq.
12.	**FEED PUMP PRESSURE SAND FILTER**	
	Type	Mono-block
	MOC	Body-CI, Impeller-SS
	Flow	12.5 m3/hr, 30 m head
	Quantity	2 nos. (1W + 1 SB)
	Make	Kirloskar/CNP/Eq.
13.	**PRESSURE SAND FILTER**	
	Size	1.05 m Dia
	MOC	MSEP
	Loading rate	12 m3/m2/hr
	Quantity	1 no.
	Make	Pentaire/Aventura/Fabricated
14.	**ACTIVATE CARBON FILTER**	
	Size	1.05 m Dia
	MOC	MSEP
	Loading rate	12 m3/m2/hr
	Quantity	1 no.
	Make	Pentaire/Aventura/Fabricated
16.	**POLYELECTROLYTE DOSING SYSTEM**	
	Dosing Pumps	2 Nos.

	Purpose	For dosing of coagulant/polyelectrolyte
	Chemical	Polyelectrolyte
	Capacity	0 - 10 LPH
	Type	Metering
	Pump make	E Dose/Milton Roy/Prominent
	DOSING TANK	
	No.	1 No.
	MOC	HDPE
	Capacity	100 Ltr.
	Tank Make	Syntex / Plasto/Reno
	MIXER	
	Type of mixer	Turbine type impeller mixer
	MOC	SS-316
	RPM	50 rpm
	Make of mixer	ABS/CNP/Fivebro/Fabricated/Eq.
19.	**PIPING**	
	Qty– 1 Lot.	
	MOC–MS , Water Line- MS Class B , Air Line - MS Class B	
	Make - Jindal/Tata/Eq.(ISI Grade)	
20.	**VALVES**	
	Qty – 1 Lot.	
	MOC - Brass/MS/CI	
	Make –Intervalve/Delvalve/Eq.	
21.	**ELECTRICAL**	
	1 Lot, MCCB based MCC Panel	
	Make	Switch gear- ABB/L&T/Siemens/CNS
	Type of Panel	• Double front, Fixed Type, non-compartmentalized floor mounted panels. • Fabrication material - CRCA Sheet - Load bearing surfaces -3MM, Gland Plates – 3MM. • Non load bearing surfaces – 1.6 mm thick Siemens greating powder coating
	IP Protection	IP 54
	Type of Mounting	Free standing Floor Mounted, Cable bottom entry.
	Cables Qty.	1 Lot.
	Cable Make	Polycab /Havells/Eq.



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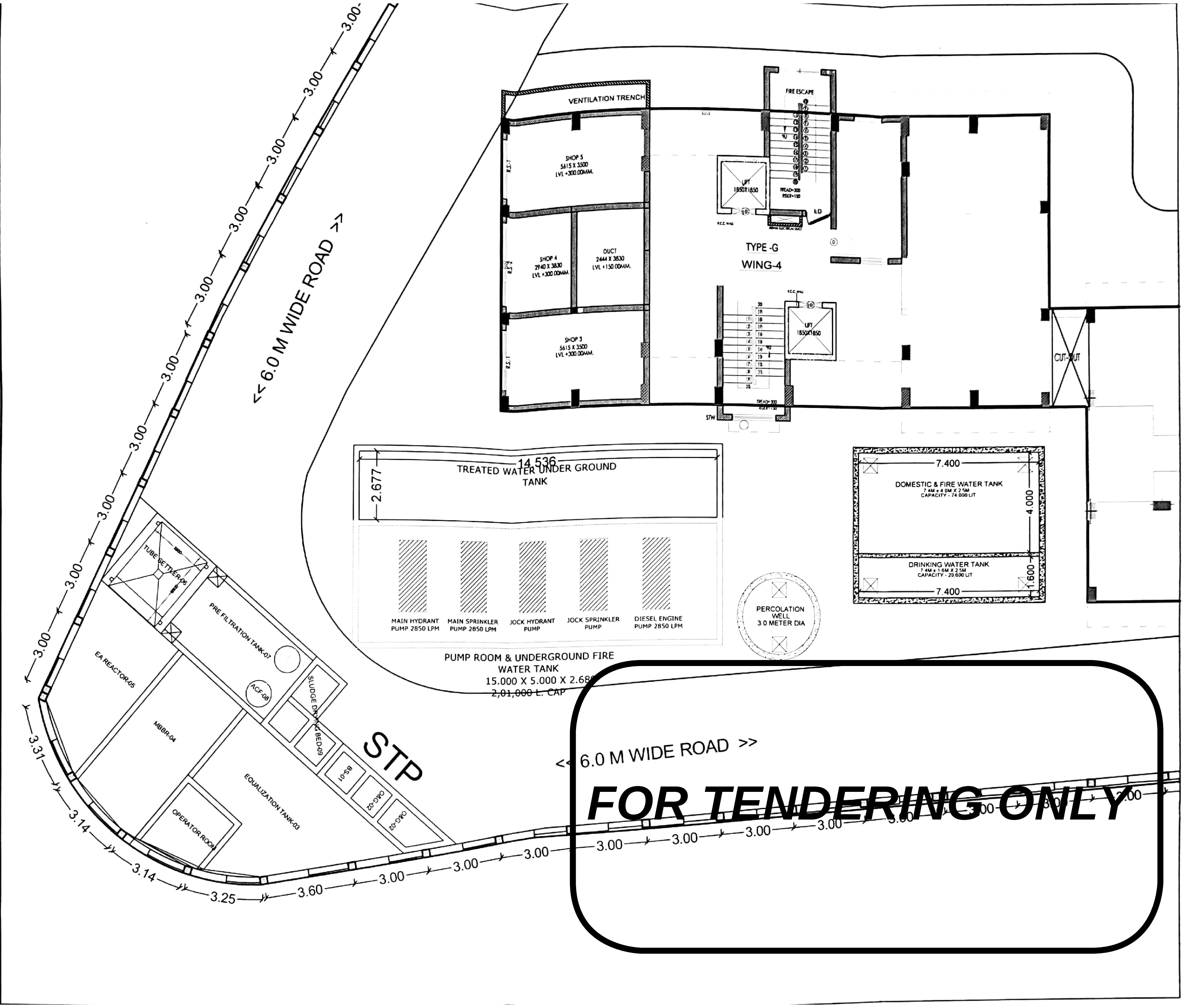

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