

Grit Chamber

Export DXF ☐ Report

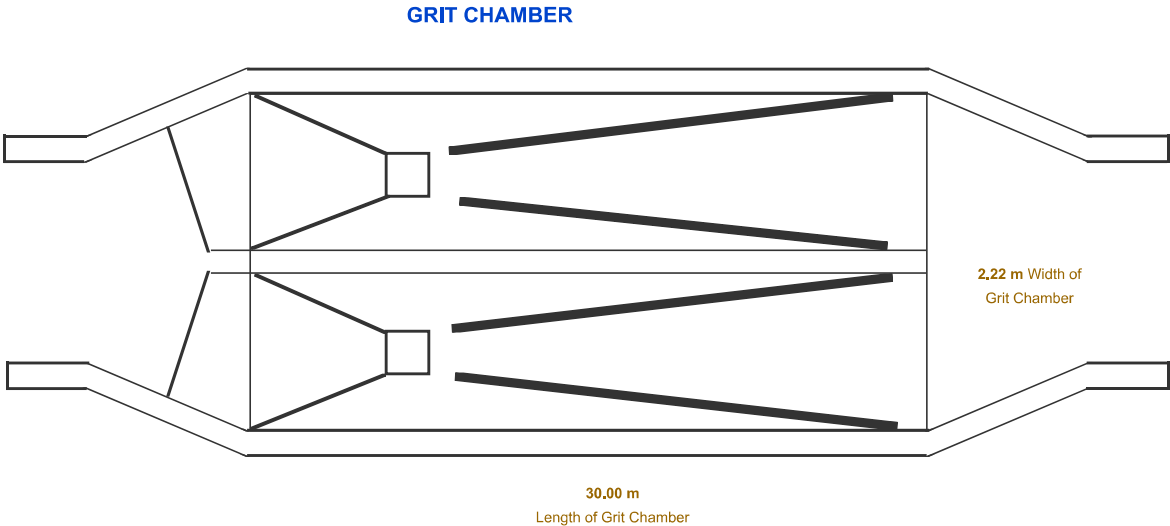
Input

Specific Gravity of Particles (Ss)	<input type="text" value="2.65"/>
Acceleration due to Gravity (g)	<input type="text" value="9.8"/> m ² /sec
Diameter of smallest Grit particle (d)	<input type="text" value="0.3"/> m
Kinematic Viscosity (Kv)	<input type="text" value="0.0001"/> m ² /sec
Depth of the grit chamber (H)	<input type="text" value="3"/> m
h1	<input type="text" value="1"/> m
h2	<input type="text" value="1"/> m
h3	<input type="text" value="1"/> m
h4	<input type="text" value="1"/> m
h5	<input type="text" value="1"/> m

Output

Average Flow Rate (Q)	290 MLD
	290000 m ³ /day
Settling Velocity (Vs)	808.5000 m ² /sec
Reynold's number (Re)	2425499.9999
By Transition Law	2425499.9999
Vs	14.5892
Re	43767.6847
Drag coefficient (CD)	0.0303
Displacement Velocity (Vd)	145.8922

Area of Grit Chamber (A)	6.6719 m ²
Length of the Grit Chamber (L)	30.00 m
Width of the Grit Chamber (W)	2.22 m
Peaking Factor (Pf)	1.5
Width (b)	0.5265 cm
b1	6.0720 cm
b2	6.0720 cm
b3	6.0720 cm
b4	6.0720 cm
b5	6.0720 cm



Skimming Tank

Input

Export DXF ☐ Report

Depth of tank (D) m

Rising velocity of greasy material (Vr)

0.25

m/min

Flow Rate (Q)

290

MLD

290000

m³/day

3.3564

m³/sec

0.0041

m/sec

5.0104

m²

2.5252

m

Rising velocity of greasy material (Vr)

Surface area of skimming tank (A)

Diameter tank (d)

Output

SKIMMING TANK



Primary Settling Tank

Export DXF ☐ Report

Design of Primary Settling Tank

Surface over flow rate (S.O.R.)

50

m³/m²/day

Wier overflow rate (W.O.R.)

300

m³/day

Design of Sludge Hopper

Percentage of solids removed by Grit Chamber

45

%

Solids in Clarifier

120

mg/lit

Percentage of solids removed by Clarifier

55

%

Input

Side water depth (S.W.D.)	<input type="text" value="3"/>	Total Solids	<input type="text" value="70"/>	%
Number of tanks (n)	<input type="text" value="2"/>	Volatile solid	<input type="text" value="30"/>	%
Bed Slope V	<input type="text" value="10"/>	Fixed Solid	<input type="text" value="1"/>	
W	<input type="text" value="10"/>	Specific gravity - Volatile Solids (Vss)	<input type="text" value="2.5"/>	
Design of collection channel				
Velocity of flow in channel (V)	<input type="text" value="0.35"/>	Percentage of Solids Dried in Clarifier	<input type="text" value="-3"/>	%
	m/sec	Sw	<input type="text" value="1000"/>	Kg/m ³
Width of channel (W)	<input type="text" value="0.7"/>	Ps	<input type="text" value="0.03"/>	
	m	Frequency of cleaning of sludge hopper	<input type="text" value="12"/>	hours
		Frequency of cleaning of sludge hopper	<input type="text" value="0.5"/>	day
		tanØ	<input type="text" value="2"/>	
		rb2	<input type="text" value="55"/>	m

Output

Design of Primary Settling Tank

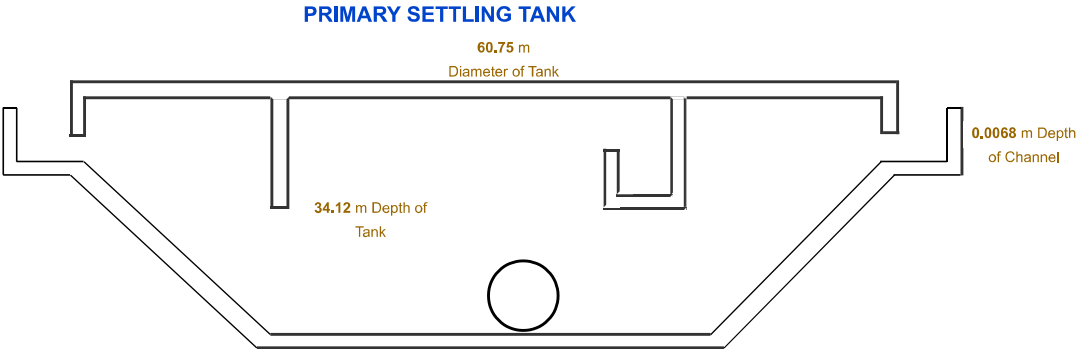
Flow Rate (Q)	290	MLD
	290000	m ³ /day
	3.3564	m ³ /sec
(V:W)	1.0000	
Area of tank (A)	5800	m ²
Area of each tank (a)	2900	m ²
Diameter of tank (d)	60.7528	m
Flow through each tank	145000	m ³
Check for W.O.R.	759.4106	m ³ /m ² /day
Volume of tank (V)	8700	m ³
Detention time (T)	0.06	day
	1.44	hours
Depth due to slope at centre (D)	30.3764	m
Total depth (D)	34.1264	m

Design of Collection Channel

Area of channel (A)	0.0047	m ²
Depth of channel (A)	0.0068	m
Free Board (ff)	0.3	m
Total Depth (D)	0.3068	m
Wetted Perimeter (p)	1.3136	m
Hydraulic mean radius (m)	0.0036	
Manning's Coefficient (N)	0.02	m
Slope of channel bed (i)	0.0871	
Slope	11.4689	

Design of Sludge Hopper

Total Suspended Solids (Ss)	2500	mg/lit
Dry solids (Ms)	54.00	mg/lit
	540.00	Kg/day
Suspended solids (Ss)	0.82	
Ss	1.2195	
Specific gravity of Sludge (Ssl)	1.2760	
Ssl	0.7836	
Volume of sludge (V)	22.9680	m ³ /day
Volume of hopper	11.4840	m ³
Ø	63.4349	degree
tan(90-Ø)	26.5650	degree
Volume (V)	2.0942	
rb1	26.2628	
H	52.5012	m
h	109.9488	m
Height of Hopper	-57.4476	m



Aeration Tank

[Export DXF](#) ☐ **Report**

Input

Percentage recirculation

35 %

Aeration period (T)

5 hours

Depth of tank (d)

2.0 m

Output

Flow Rate (Q)

290 MLD
290000 m³/day
3.3564 m³/sec

Percentage recirculation

0.35

Volume of Returned Sludge (v2)

101500.00 m³/day

Capacity of Tank

81562.50 m³

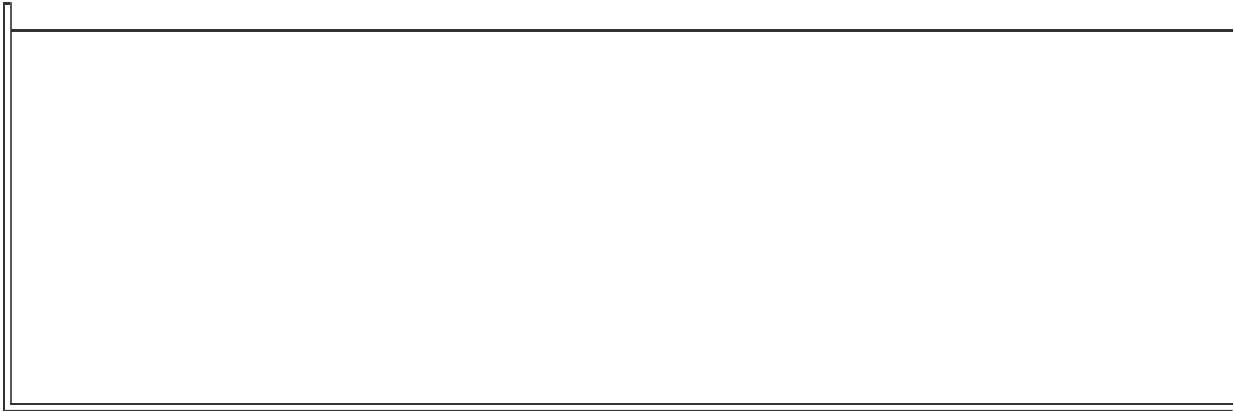
Area of Tank (A)

40781.25 m²

Diameter of tank (D)

227.9268 m

AERATION TANK



227.92 m
Diameter of Tank

Trickling Filter

Export DXF ☐ Report

Input

Design of Trickling Filter

Effluent B.O.D. (Le)	<input type="text" value="15"/>	mg/lit
Recirculation Ratio (R)	<input type="text" value="2"/>	
Depth of Trickling Filter (D)	<input type="text" value="2.3"/>	m
Number of Units	<input type="text" value="2"/>	

Design of central pipe and distributory system

Velocity of flow	<input type="text" value="0.5"/>	m/sec
Provide Sections	<input type="text" value="4"/>	
Provide Joint Length	<input type="text" value="0.2"/>	m

Design of Orifice

Drag Coefficient (Cd)	<input type="text" value="0.6"/>	
Depth of Orifice(h)	<input type="text" value="0.1"/>	m
Diameter of Orifice	<input type="text" value="0.025"/>	m
Proportionate area of sections 1st Section	<input type="text" value="0.11"/>	%
2nd Section	<input type="text" value="0.35"/>	%
3rd Section	<input type="text" value="0.57"/>	%

Design of Under Drainage System

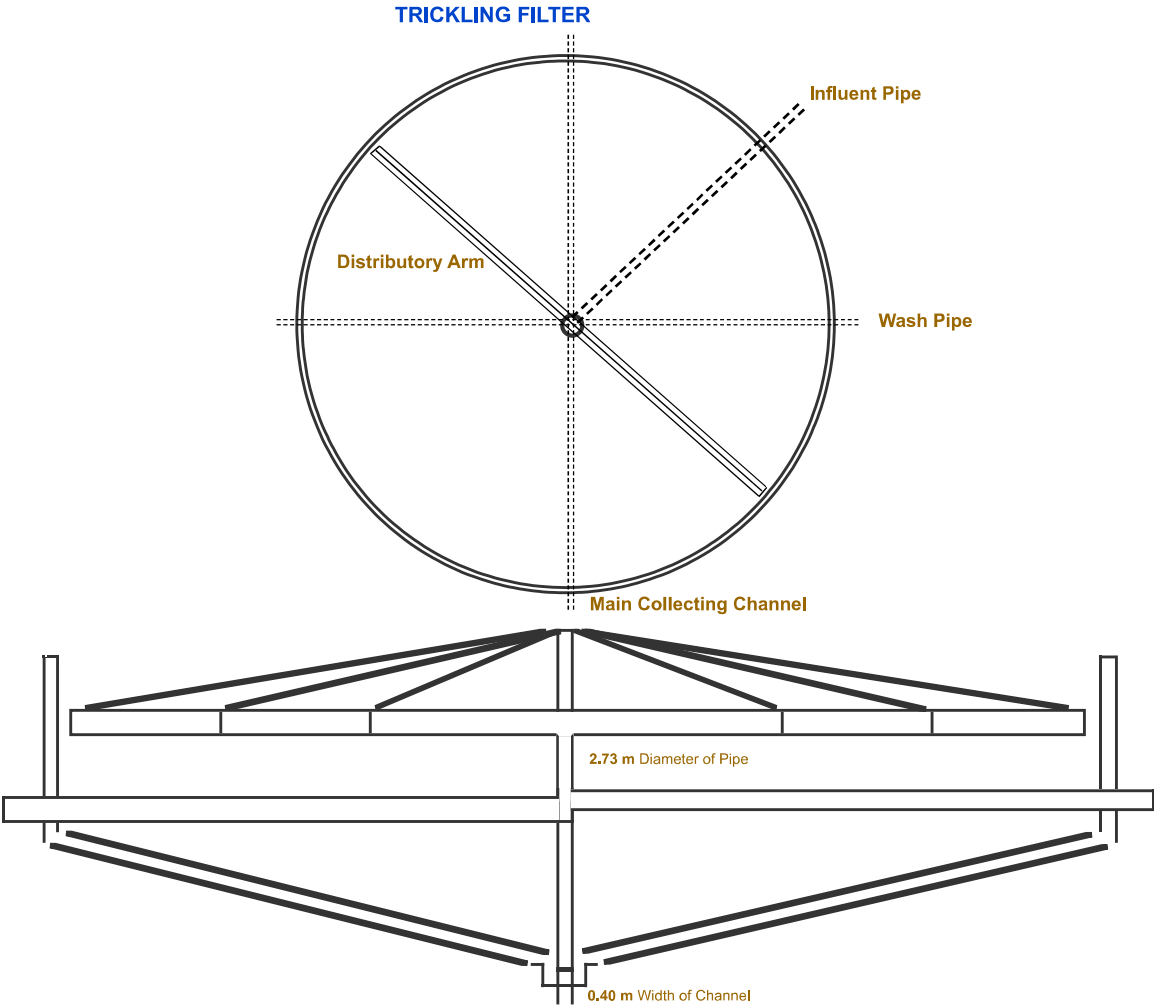
Spacing of Under Drain	<input type="text" value="0.3"/>	m
Velocity of Flow	<input type="text" value="0.4"/>	m/sec

Design of Collecting Channel

Output

Design of Trickling Filter			Design of central pipe and distributory system		
Flow Rate (Q)	290	MLD	Flow after entering in central pipe (Q)	145.00	MLD
	290000	m³/day		1.6782	m³
	3.3564	m³>/sec	Peaking factor (Pf)	1.5	
Influent B.O.D. (Li)	300	mg/lt	Flow of central pipe	5.8738	
Overall efficiency	95.0000	%	Area (A)	5.8738	m²
Applied B.O.D.	110.00	mg/lit	Diameter of pipe	2.7341	m³
Area of Trickling Filter (A)	110134.0225	m²	Average velocity (Vavg)	0.2857	
Diameter of Tank (d)	152.8455	m	Diameter of T.F.	264.7362	m
Hydraulic Loading Rate	7.8994	lit/m²-day	Length of each arm	131.0010	m
	7.8994	lit/m²-day	Length of Sections	32.7502	m
Organic Loading	0.3949		1st Section	32750.2585	mm
	0.3949			32.7502	m
			2nd Section	32750.2585	mm
				32.7502	m
			3rd Section	32750.2585	mm
Design of Orifice					
Area of orifice	0.0004	m²			
Discharge through orifice	0.0004	m³/Sec			
Number of orifices required for each arm (Total discharge through each arm/Discharge of orifice)	4066.3882		L 1	32.9502	m
	4066		L 2	65.7005	m
Number of orifices in each Section	447.26	447	L 3	98.4507	m
1st Section	1423.10	1423	Area of Sections	3370.8382	m²
2nd Section	2317.62	2318	A1	10154.0635	m²
3rd Section			A2	16895.9914	m²
Spacing of Orifices	0.0732	mm	A3		
1st Section			Proportionate Area for each Sections	0.1108	%
2nd Section	0.0230	mm	1st Section		
3rd Section	0.0141	mm	2nd Section	0.3337	%
			3rd Section	0.5554	%
Design of Under Drainage System					
Diameter of T.F.	152.8455	m	Discharge per section	1.6782	m³/Sec
Number of laterals	1018.9703		Q1		
Average flow per filter	1.6782	m³/sec	Q2	1.4922	m³/Sec
Discharge through each channel	0.0016	m³/sec	Q3	0.9321	m³/Sec
Area of each lateral	0.0041	m²	Area of Sections	3.3564	m²
Check for average velocity	0.4000	m/sec	A1	2.9845	m²
Radius of lateral	0.0723	m	A2		
			A3	1.8642	m²
			Diameter of sections	2.0668	m
Design of Collecting Channel			d1		
Area of channel	4.1956	m	d2	1.9489	m
Depth of channel	10.4890	m	d3	1.5403	m
Manning's Coefficient (N)	0.02	m			
Hydraulic mean radius (m)	0.1962				

Slope of channel (i)	0.0005
1 in	1782.0615



Secondary Settling Tank

Input

Export DXF ☐ Report

Design of Secondary Clarifier

Design of Sludge Hopper

Depth of Clarifier (D)	<input type="text" value="7"/> m ²	Percentage of solids removed by T.F.	<input type="text" value="93"/> %
		Production of solids in T.F.	<input type="text" value="0.4"/> Kg/B.O.D.
		Percentage of dry solids	<input type="text" value="70"/> %

Output

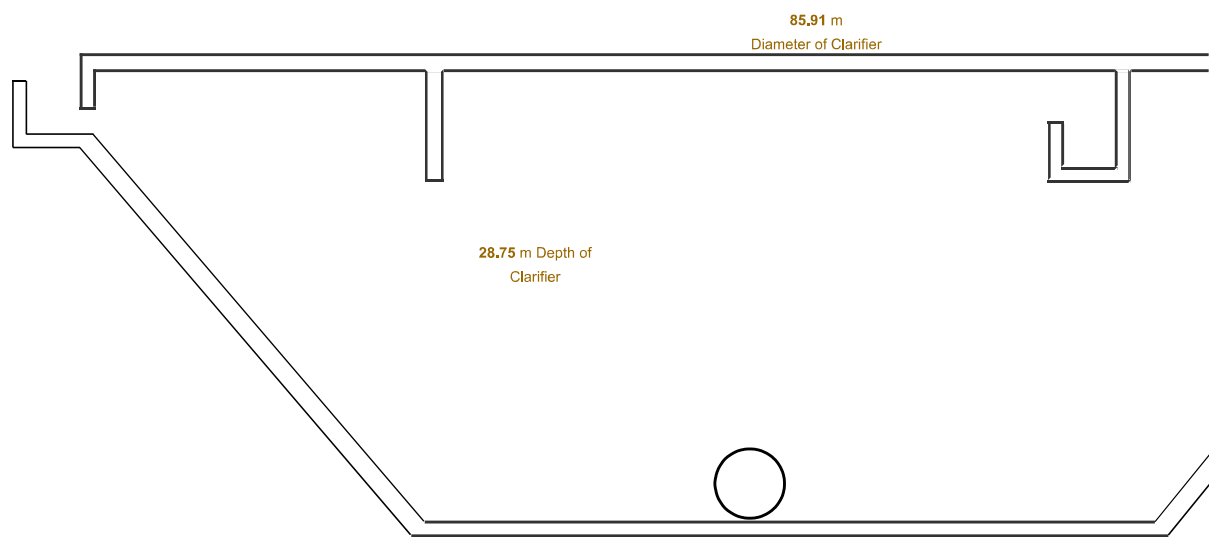
Design of Secondary Clarifier

Design of Sludge Hopper

Flow Rate (Q)	<input type="text" value="290"/> MLD	Specific gravity of Sludge (Ssl)	<input type="text" value="0.7836"/>
	<input type="text" value="290000"/> m ³ /day	Volume of Sludge (Vs)	<input type="text" value="520"/> Kg/day
	<input type="text" value="3.3564"/> m ³ /sec	Dry solids (Ms)	<input type="text" value="364"/> Kg/day

Flow through S.S.T. (Q)	145000	lt/day	Sw	1000	Kg/m ³
Surface overflow rate (S.O.R.)	50	m ³ /m ² /day	Ps	0.03	
Recircultion ratio ®	2		Volume of sludge produced in S.S.T.	15.4840	mg ³ /day
Total flow through clarifier	290000	lt/day			
	3.3564	m ³ /sec			
Area of Clarifier (A)	5800	m ²			
Volume of Clarifier (V)	40600	m ³			
Diameter of Clarifier (d)	85.9175	m			
V	10				
H	10				
(V:H)	1.0000				
Total depth at the centre of clarifier	28.7500	m			
Detention time (T)	0.28	day			
	6.72	hours			
	6.72	hours			

SECONDARY SETTLING TANK



Digester Unit

Export DXF

Report

Input

Time required for digestion (T)

45 day

Height of Digester (H)

10 m

Output

Volume of Sludge from P.S.T. (Vpst)

22.9680 m³/day

Volume of Sludge from S.S.T. (Vsst)

15.4840 m³/day

Volume of Fresh Sludge (Vf)

38.4520 m³>/sec

Volume of Digester Sludge (Vd)

12.8173 m³>/sec

Volume of Digester (V)

1538.0800 m³

Area of Digester (A)

153.8080 m²

Diameter of Digester tank (D)

13.9912 m

Dry Solids in P.S.T.

540.00 Kg/day

Dry Solids in S.S.T.

364 Kg/day

Total Volume of Sludge (Vs)

715 Kg/day

Volatile solids destroyed (Vsd)

52.50 %

VSD

393.25 Kg. Vs/day

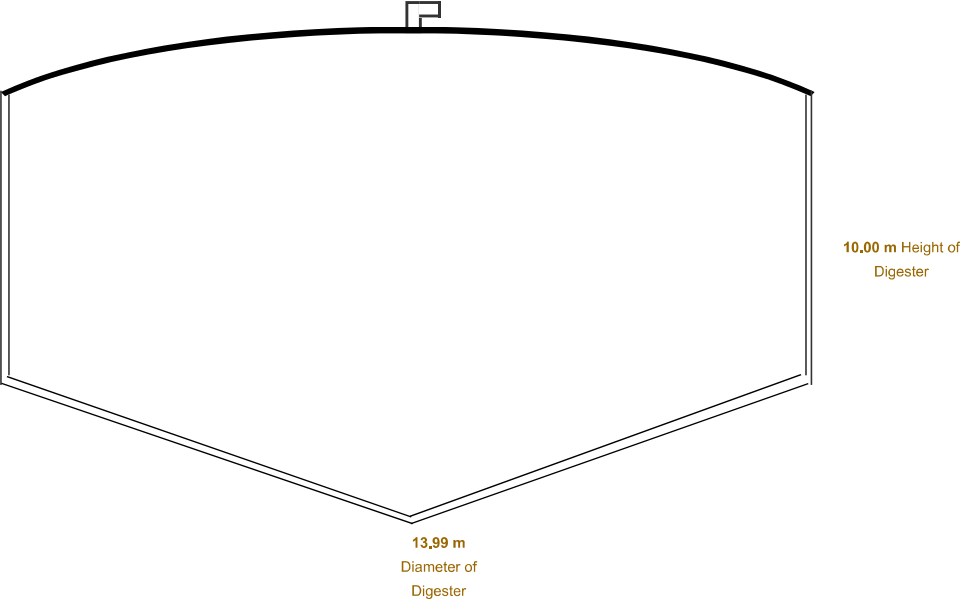
Quantity of total gas produced during digestion

294.93 m³

Quantity of methene gas produced during digestion

196.62 m³

DIGESTER UNIT



Sludge Drying Beds

Export DXF ☐ Report

Input

Depth of Sludge application (D)

0.3m

Length of drying bed (L)

20m

Frequency of Sludge remove (f)

15day

Output

Volume of Sludge Digester (V)

12.8173m³

Area of Sludge drying bed (A)

42.7243m³

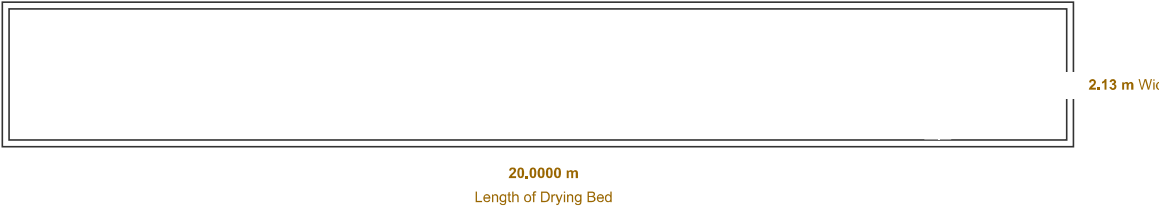
Width of drying bed (W)

2.1362m

Number of Sludge drying beds (n)

15

SLUDGE DRYING BEDS



Generate Images before Exporting Report to Word. If any image is not proper then [Generate](#) that image again.

Generate Images Export to Word Save Record Save to File

[Back to top](#)