Improving sanitation in Wai

DETAILED PROJECT REPORT

Submitted by:

Wai Municipal Council

Proposal submitted
For technical Sanctioning:
Maharashtra Jeevan Pradhikaran (MJP)

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PROJECT REPORT

SUMMARY OF THE PROJECT

Wai is a class C municipal council located in Satara district of Maharashtra. As per Census 2011 the city has total population of 36,025 and with 7580 HHs. About 6% (456) of the HHs reside in slums; these slums HHs are being rehabilitated under IHSDP scheme. 68% HHs in Wai have individual toilet facility, of which 86% HHs are connected to septic tanks. In Wai, 30% of HHs are served by 264 functional community toilet seats (42 blocks) which are connected to septic tank. Currently, 2% HHs resort to open defecation and are not served by either individual or community facilities.

Majority of the toilets in Wai city are connected to septic tanks. Septic tanks are largely oversized and do not confirm to standards prescribed in IS codes and CPHEEO manuals. Further the erratic emptying cycle of septic tanks (around 5-7 years) leads to high levels of BOD in effluent and wastewater flowing in the drains.

In most of the cases, the septic tank outlet along with greywater from kitchen and bathroom is connected to open / closed drains. The road side drains ultimately connect to river Krishna. In Wai, the septage from the septic tanks is disposed off at the solid waste dump site without any treatment. As per recently revised CPHEEO manual on sewerage and sewage treatment, septage from septic tanks contains harmful substances that can adversely impact human health. Hence proper treatment of Septage is required and cannot be disposed of on land or water bodies without treatment. It is important that a proper treatment facility for Septage is available.

In this regard, DPR for construction of treatment facility for septage is prepared for improving the sanitation condition of Wai. The treatment option proposed for Wai is Sludge drying bed (SDB). Eleven numbers of such SDB's (Drawing is attached) would be required for the incoming daily septage load and this septage would be allowed to dry for 15 days to form sludge cakes.

ABOUT TOWN

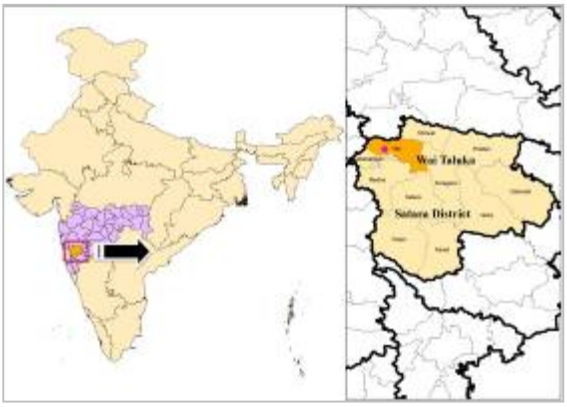
Wai, a town in Satara District (Maharashtra, India) is also know by epithetic name of Dakshin Kashi and is well known for its Ghats on the banks of River Krishna and 250 temples frequented by visitors. Located at 95 kms from Pune and 250 kms from Mumbai, it is a important city on-route to the hill station destinations of Mahabaleshwar and Panchgani. WMC is governed by the Maharashtra Municipal Councils, Nagar Panchayats and Industrial Townships (MMCNPIT) Act 1965.

Table 1: Salient features of Wai

City	Wai
District	Satara
Location	Latitude 17°56′N and Longitude 73°53′ E
Connectivity	Wai is 11 kms from NH-4 (Pune-Bangalore Highway) and nearest railway station is 32 kms
Civic status	Municipal Council/ Nagar Parishad 'C' class
Total Area	3.64 sq km
Inhabited Area	1.35 sq. km (37% of the total area)
Population	36,025 in 2011
Density (ppha)	99 (gross) and 267 (for inhabited area)
Slums	Population 2140 (6% of the total population)
Number of Wards	19 electoral wards managed through 5 Prabhags

Source: Wai Municipality, CSP Analysis

Wai – Location



OUTLINE OF THE PROJECT AND ITS OBJECTIVES

SCOPE, NEED AND JUSTIFICATION

As it has been already mentioned that majority of toilets in Wai are connected to septic tanks. The septage from the septic tanks is disposed off at the solid waste dump site without any treatment. The MoUD advisory on septage management advises septic tank effluent and septage, with appreciable levels of organics, nitrogen and pathogens when disposed without proper treatment are a cause of concern on account of the organic carbon (as measured as BOD5), nitrogen, phosphorus and pathogens in them. Pathogens reaching the ground or surface water can lead to human diseases

through direct consumption, recreational contact or consumption of contaminated shell fish. Improper disposal of septic tank effluents and septage can pose direct and indirect socio-economic impacts too. It is also suggested in NUSP that well managed onsite sanitation systems can also provide good public health and environmental outcomes.

Hence, in this regard there is a need to construct a treatment facility for proper treatment of septage generated from onsite sanitation system in Wai City.

TARGETTED / NEEDED OF PROJECT IDENTIFICATION

BASELINE SURVEY

The underground drainage and sewerage systems do not exist in the Wai city. As there is no underground sewerage system in the town, the sewage at present is discharged into the river through the septic tanks and open drains.

As per Census 2011, 68% of households in Wai have access to individual toilets. A considerable number of households (30.34%) depend on community toilets.

Table 2 : Sanitation Coverage in Wai

Component	No.
Total residential households	7580
Households having individual toilets	5145
Households relying on community toilets (CT)	2300
Households practicing Open defecation	135

Source: Census 2011

Existing individual toilets are pour flush latrines which are connected to septic tanks. However, in most cases, these septic tanks vary in sizes and dimensions. The predominant reasons for this are space constraints and limited knowledge about functioning of septic tanks. Septic tanks usually have 2-3 chambers and are placed under the toilets, making access difficult.

Table 3 : Details of existing onsite sanitation treatment

Component	No.
HH having individual toilets	5145
Toilets having Septic tanks	4429
Toilets having non functional septic tanks (about 20%)	886
Toilets having Other facility	716

Figure 1: Individual Household Sanitation in Wai

Source: Census 2011, Primary Survey

Due to space constraints, most households construct a toilet outside the house abutting the main street. In such cases the effluent of the pit/ septic tank is discharged into the road side open or closed drain. The newly developed residential areas (including bungalows, group housing schemes) in the city seem to have properly designed septic tanks as the primary treatment for black water. However the septic tanks do not always connect to soak pits. The effluent from the septic tanks is discharged in the open drains along the road.

Field interactions confirm that most of the residents lack knowledge about functioning and maintenance of onsite facility. The toilet seats/ pans for individual toilets are regularly cleaned; however, periodic cleaning of the pits or septic tanks is not carried out. While effluent is discharged into the nearby open drain along the street, the fecal part remains in the pit or tank and is not flushed out for several years. The toilet pits were cleaned only once in three to seven years.

Septage Management

Wai relies on on-site sanitation system along with a system of open/closed drains along the main roads. As evident from the flow diagram below, effluent from septic tanks/ pits of individual as well as community toilets is directly discharged into open or closed drains along the streets.

Figure 2: Existing waste water system in Wai

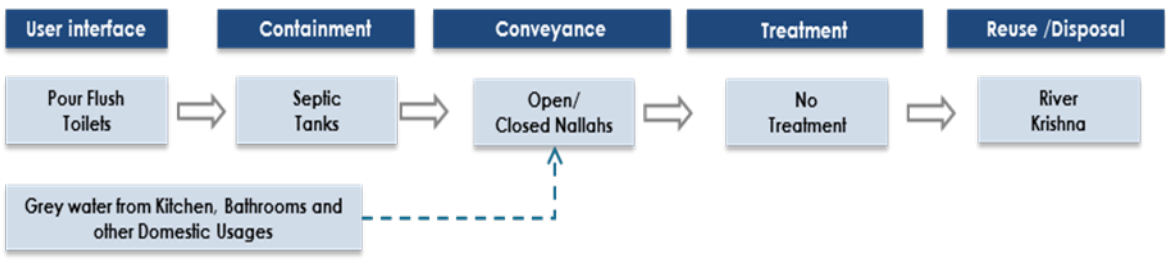


Figure 3: Discharge of black water / effluent from Septic tanks into open drains

Samples of wastewater were collected from various points across the town also suggest low efficiency of primary treatment in septic tanks. Due to long cleaning cycle of septic tanks septage solidifies in the septic tank and the treatment efficiency of septic tanks is reduced due to reduction in retention time of wastewater in septic tanks, due to which whatever wastewater enters the septic tanks leaves the septic tanks and enters into the drains without primary treatment. Personal interviews revealed that in many cases septic tanks were cleaned once in 3 to 7 years and some were yet not cleaned even once.

Conveyance System

WMC provides a demand based system for septic tank emptying. The local authority owns one suction machine of 5000 litre capacity for cleaning of septic tanks and charges Rs. 1000 per cleaning. However, only about 2% of septic tanks are cleaned annually. However, septic tanks for community toilet blocks are emptied too frequently (once a week). This results in inadequate or lack of any treatment to fecal sludge in these systems.

Figure 4: Existing septage emptying and conveyance vehicle in Wai

Treatment System

The waste collected from septic tanks is disposed of on dumping grounds located 3km away from the town, without any treatment. This ground is also used for disposal of municipal solid waste.

Figure 5: Location of dumping of Septage at solid waste dumping site

PROPOSED PROJECTS

Wai city is proposing to introduce regulated septic tank emptying service. As recommended by MoUD advisory, the HHs in Wai need to follow 3 year emptying cycle of septic tanks. Thus annually ULB officials need to empty around 1760 HHs level septic tanks. The septage emptying has to be properly treated at the treatment facility. Presently there is no treatment plant available in Wai.

Hence, the treatment option proposed for Wai is Sludge drying bed (SDB). The simple technology is also recommended by the MoUD advisory in case land is available. Under this option septage is distributed over a filter media of sand and gravel and left for drying for a few weeks. The liquid portion seeps through the filter media and gets collected in an under drain pipe and is disposed or further treated if disposal standards are not met.

Many septage treatment plants use lime to provide both conditioning and stabilization before the septage is de-watered, and this de-watered sludge can be used as organic fertilizer after drying and composting. Additionally, lime stabilization also helps to reduce / minimize odour. The common practice is to add lime into effluent collection tank to raise the pH to 12 (2.4 – 3.0 kg/1000 liters of septage) and hold it for a period of 30 minutes.

Figure 6: Typical section and plan of SDB

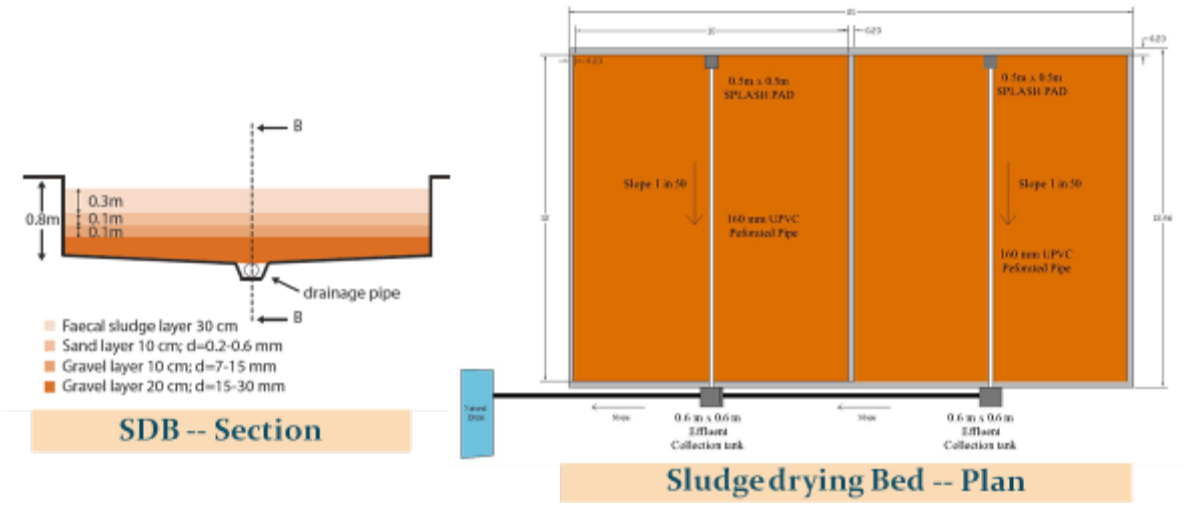


Table 4: Designing of Sludge Drying Bed

	Treatment Plant Option (Unplanted Sludge drying Beds)	
1	Quantum of septage to be treated (cum/day)	**27.18**
2	Single Drying Bed area (12m x 10 m)	120
3	Max. septage depth (m)	0.3
4	Capacity per bed (cum)	36
5	**Sludge drying cycle (days)**	**15**
6	**Total No. of sludge drying beds required (SDB)**	**11**
7	**Total site area (SD Bed area + 10% SD bed area + area of office and dried storage + area of ancillary units) (sqm)**	**1709**

Eleven numbers of such SDB's (Drawing is attached) would be required for the incoming daily septage load and this septage would be allowed to dry for 15 days to form sludge cakes. The size of one SDB would be 12 m x 10 m x 0.8 m; the typical sketch of the sludge drying bed is depicted in the figure. The total area that would be required for constructing the sludge drying bed treatment facility would be 1709 sq m. Detailed Drawing of Sludge drying bed along with site plan is attached.

Figure 7: Location of Septage treatment facility

Septage can be treated at the WMC solid waste dump site campus which is located around 3 km from the city as shown in figure. Existing vermi-composting plant can use this treated septage (mixed with vermi-compost after drying and can also be sold as a soil enricher). Operation and management of treatment facility can be outsourced to private sector.

PROJECT IMPLEMENTATION METHODOLOGY

The Construction contractor would be selected through transparent bidding e-tendering process. Open bidding process would be advisable as it increases competitiveness and awareness amongst the interested parties. For the selection process, WMC is required to get a detailed Bid Document Prepared. The Document should contain the following:

1) Detailed terms and conditions of the tender like qualification criteria, evaluation mechanism etc.
2) Draft agreement to be signed with the contractor.

Fixation of qualification criteria would be one of the important aspects for the selection process. This will ensure the quality and number of the participants in the bidding process. The pre qualification criteria for this project should be fixed up and disclosed in the Notice Inviting Tender (NIT). For adequate participation in the bidding process, it has been proposed that the advertisement of NIT should be published in 2-3 leading daily newspaper. The pre-qualification criteria would comprise of the following:

1) Technical qualification criteria including year of experience, volume of the business, available resources, etc.
2) Financial qualification criteria include turnover, Net worth, etc.

The evaluation of project proposal received from the interested parties would be carried out as per the terms stated in the Bid Document. A committee of WMC may be entrusted to evaluate the bid proposals based on the terms stated in the Bid Document. The evaluation mechanism would be structured as a two-stage evaluation process. In the technical stage, the bidder would be short-listed based on the experience and their financial health. The financial bid will be opened of these short listed bidders. The party quoting the lowest cost would be selected for signing the agreement for construction of the Sludge Drying Beds. It may also be possible that due weight age of technical evaluation would be given at the time of final selection.

The time schedule of the above selection process would require around 1 month time. Details time chart of the selection process would be as under.

Stages	**Time**
Issuance of Notice Inviting e-Tender	T_o
Submission of Tender and opening of Technical Bid	$T_o + 14$
Opening of Financial Bid	$T_o + 16$
Issue of Letter of Intent	$T_o + 30$

METHODOLOGY AND MONITORING

WMC has in-house team comprises of city engineer, sanitary inspector and supervisors to monitor the construction project. WMC will be responsible for day to day supervision on physical progress of work with assure quality of construction work. This will be done through a system of internal audit and through physical verification of various activities.

The monthly progress reports will be submitted by WMC and will be presented in two parts:

- Physical progress reports showing details of work being done on each site, for each activity/component
- Financial progress reports that shows corresponding expenditure for each of the activity

A consolidated monthly physical and financial progress status report along with supported document will be submitted to the respected nodal officer.

OPERATION AND MAINTENANCE OF SLUDGE DRYING BEDS

As the city government, WMC has its own duty to operate and maintain the public utilities services like septage treatment facility. The operations of this facility can also be outsourced to a private sector.

Cost required for maintaining sludge drying beds will be arranged from the own fund sources of Wai Municipal Council.

BENEFITS ENVISAGED FROM THE PROJECT-TO TARGET GROUP

City population and population on the outer area depending on the ground water source will be the beneficiaries of the proposed project. The main benefits envisaged from the project are:

- Significant reduction in the pollution level of water bodies and rivers
- Health improvement of the people
- Prevention of various water borne diseases such as diarrhea, Dysentery, cholera, Jaundice, Typhoid, etc. saving huge amount of money which would have been spent for treatment of these diseases
- Clean and green environment

COST OF PROJECT AND MEANS OF FINANCE

All the rates considered here are based on PWD rates (for buildings) corrected for today's input costs. Detailed measurement sheet and abstract sheet is attached.

A. Land & Site Development

The total area required for constructing the 11 numbers of sludge drying bed treatment facility would be 1709 sq m. This treatment facility would be constructed at the WMC solid waste dump site campus which is located around 3 km from the city. As the land belongs to WMC, the land cost has not been considered in the project.

B. Buildings and Civil Works

Eleven number of sludge drying beds for treatment of septage is proposed.

Sl. No.	Description	Amount (Rs.)
1	Construction of the 11 number of sludge drying beds	71,11,569
2	Land Cost	To be provided by WMC free of Cost
	Total	**71,11,569**

Total Project Cost

Sl. No.	Description	Amount (Rs.)
1	Construction of the 11 number of sludge drying beds	71,11,569
3	A&S Cost (5% of estimated cost of item 1)	3,55,578
	Total	74,67,147

Pictures of the land proposed for the construction of Sludge Drying Beds

Cost estimates:

Name of work: Construction of sludge drying beds for septage treatment at city survey no 238 (old) / 259 (new), near solid waste dump site

Abstract Sheet:

Qty.	It. No	Description of Item	Rate	Per	Amount
1	2	3	4	5	6
1764.41	1	Excavation for foundation in earth,soil of all types, sand, gravel & soft murum, including removing the excavated material upto a distance of 50m. beyond the building area & stacking and spreading directed, dewatering,preparing the bed for foundation & necessary backfilling, ramming watering including shoring and strutting etc. complete (i) Lift upto 1.5 m (a) by manual means			
		DSR 2014-15, P-7, I- 1i a/1			
		Rate as per R.A	153.30	Cu.Mt.	270484.05
293.45	2	Providing dry/ trap/ granite/ quartzite/ gneiss rubble stone soiling 15 cm to 20 cm thick including hand packing and compacting complete.			
		DSR 2014-15, P-12, 1- 11/1			
		Rate as per R.A	1488.80	Cu.Mt.	436888.36
154.55	3	Providing and laying in situ, cement concrete in M-10 of trap/ granite/ quartzite/ gneiss metal for foundation and bedding including bailing out water, formwork, compacting and curing complete, with fully automatic micro			

Qty.	It. No	Description of Item	Rate	Per	Amount
1	2	3	4	5	6
		processor based PLC with SCADA enabled reversible Drum Type mixer,With natural sand. Spec. No.: Bd.E.1 Page No. 287			
		DSR 2014-15, P-21, I - 1 a /4			
		Rate as per R.A.	5119.15	Cu.Mt.	791164.63
31.48	4	Providing and laying in situ cement concrete M-20 of trap /granite /quartzite/gneiss metal for RCC.work in foundations like raft, strip foundations, grillage and footings of R.C.C columns and steel stanchions etc. including bailing out water, formwork,cover blocks compaction & curing roughening the surface if special finish is to be provided (Excluding reinforcement and structural steel) complete, With fully automatic micro processor based PLC with SCADA enabled reversible drum type concrete mixer With natural sand. Spec No.: Bd.F.3 Page No.298 and B.7,Page No.38			
		DSR 2014-15 , P - 25, I - 1 A a i /5			
		Rate as per R.A.	6219.65	Cu.Mt.	195794.58
11.66	5	Providing and casting in situ cement concrete M-20 of trap / granite /quartzite/ gneiss metal for R.C.C. columns as per detailed designs and drawing or as directed including centering, formwork, cover blocks compacting and roughening the surface if special finish is to be provided and curing complete. (Excluding reinforcement).With fully			

Qty.	It. No	Description of Item	Rate	Per	Amount
1	2	3	4	5	6
		automatic micro processor based PLC with SCADA enabled reversible drum type concrete mixer. With natural sand. Spec . No .: Bd. F5 Page No. 300 and B.7, Page.No. 38			
		DSR 2014-15, P-31,I - 2 A a i / 5			
		Rate as per R.A.	8879.40	Cu.Mt.	103533.80
18.05	6	Providing & casting in situ cement concrete M-20 of trap / granite /quartzite/ gneiss metal for R.C.C. beams and lintels as per detailed designs & drawings or as directed including centering ,formwork ,cover blocks compaction & roughening the surface if special finish is to be provided & curing complete.(Excluding reinforcement). With fully automatic micro processor based PLC with SCADA enabled reversible drum type concrete mixer With natural sand.SpecNo.Bd.F.6 Page No. 300 and B.7, Page No.38			
		DSR 2014-15 , P - 36, I - 3A a i /5			
		Rate as per R.A.	9064.95	Cu.Mt.	163622.35
59.08	7	Providing and casting in situ cement concrete in M-20 of trap/ granite/ quartzite/ gneiss metal for R.C.C. pardi 75mm thick fins including centering, formwork, cover blocks compacting and roughening them if special finish is to be provided and curing complete. (Excluding reinforcement).with reversible			

Qty.	It. No	Description of Item	Rate	Per	Amount
1	2	3	4	5	6
		Drum Type mixer with SCADA With natural sand. Spec. No.: Bd.F.11 Page No. 304 and B.7, Page No. 38			
		DSR 2014-15, P- 48, I - 6 A a i / 5			
		Rate as per R.A	10288.15	M.T	607823.90
13.269	8	Providing and fixing in position TMT-FE500reinforcement of various dimeters for R.C.C. pile caps, footings, foundations, slabs, beams, columns, conopies, staircase, newels, chajjas, lintels pardis, copings,fins, arches etc . as per detailed designs and drawing and schedules.including cutting, bending, hooking the bars, binding with wires or tack welding and supporting as required complete.			
		DSR 2014-15 , P - 51, I -8 /5			
		Rate as per R.A	65446.80	M.T	868413.59
159.84	9	Providing and casting in situ cement concrete M-15 of trap / granite /quartzite/ gneiss metal for bed blocks, foundation blocks and such other items including bailing out water formwork, compacting, roughening, them if special finish is to be provided and curing and finishing if required complete, with fully automatic micro processor based PLC with SCADA enabled reversible Drum Type mixer With natural sand. Spec. No.: Bd.E.4 Page No. 289 and B-7, Page No.38			
		DSR 2014-15, P-22, I - 3 i a /4			
		Rate as per R.A	6399.65	Cu.Mt.	1022920.06
14.26	10	Providing uncoursed rubble			

Qty.	It. No	Description of Item	Rate	Per	Amount
1	2	3	4	5	6
		masonry of trap / granite / quartzite / gneiss stones in cement mortar 1:6 in foundation and plinth of inner walls / in plinth of external walls including bailing out water, striking joints on un exposed faces and watering complete. Spec. No.: Bd.H.1 Page No. 329			
		DSR 2014-15, P- 75, I- 1 / 7			
		Rate as per R.A	4198.55	Cu.Mt.	59871.32
39.60	11	Providing internal cement plaster 12mm thick in single coat in cement mortar 1:3 with fine cement finish to concrete or brick surfaces, in all position including scaffolding and curing complete. Spec. No.: Bd.L.2 Page No. 368			
		DSR 2014-15, P-85, I-2 c/ 11			
		Rate as per R.A	242.75	Sq.Mt.	9612.90
31.68	12	Providing flush grooving pointing with cement mortar 1:3 for _ including scaffolding and curing complete.b)stone masonry work			
		DSR 2014-15,P - 87, I -9) b)			
		Rate as per R.A	101.90	Sq.Mt.	3228.19
202.98	13	Providing and applying two coats of water proof cement paint of approved manufacture and of including scaffolding if necessary, cleaning and preparing the surface, watering for two days complete.			
		DSR 2014-15, P-109, I-9/14			
		Rate as per R.A	42.20	Sq.Mt.	8565.76
264.00	14	Supplying and laying fine sand (Size 0.2 mm to 0.6 mm)at site of			

Qty.	It. No	Description of Item	Rate	Per	Amount
1	2	3	4	5	6
		work including loading, unloading and transporting lead 70 km etc.			
		DSR 2014-15, P- 402, I- 14 DSR Refference - 14 A/239			
		Rate as per R.A	2375.30	Cu.Mt.	627079.20
132.00	15	Supplying and laying Gravel (Size 7 mm to 15 mm) at site of work including loading, unloading and transporting lead 70 km etc.			
		DSR 2014-15, P- 402, I- 14 DSR Refference - 14 A/239			
		Rate as per R.A	2375.30	Cu.Mt.	313539.60
528.00	16	Supplying and laying Gravel (Size 15 mm to 30 mm)at site of work including loading, unloading and transporting lead 70 km etc.			
		DSR 2014-15, P- 402, I- 14 DSR Refference - 14 A/239			
		Rate as per R.A	2375.30	Cu.Mt.	1254158.40
132.00	17	Providing and Laying Slotted P.V.C.pipe 110mm dia. 4kg. pressure (class II)			
		DSR 2014-15, P- 390, I- 214 DSR Refference - 190/261			
		Rate as per R.A	200.00	RMT	26400.00
1764.41	18	Transport to excavated upto a lead of 1.0 km including loading, unloading etc. complete.			
		DSR 2014-15, P-426			
		Rate as per R.A	149.10	Cu.Mt.	263073.53
11.00	19	Providing R.C.C Chamber cover with frame 90cm*45cm medium duty 140kg			
		DSR 2014-15, P-396, i-Bd-v- 346 DSR reference 317a ii/266			
		Rate as per R.A	1362.10	NO	14983.10

Qty.	It. No	Description of Item	Rate	Per	Amount
1	**2**	**3**	**4**	**5**	**6**
				Total	**70,41,157.33**
				1% Insurance	**70,411.57**
				Total Cost in Rs	**71,11,568.90**
				Say Total Cost in Rs	**71,11,569.00**

Chief Officer
Wai Municipal Council, Wai

Measurement Sheet: Construction of sludge drying beds for septage treatment at city survey no 238 (old) / 259 (new), near solid waste dump site

S. N.	Description of Item	No.	Length	Width	Depth	Quantity	Total
1	Excavation for foundation in earth,soil of all types, sand, gravel& soft murum, including removing the excavated material upto a distance of 50m. g complete (i) Lift upto 1.5 m (a) by manual means						
	DSR 2014-15, P-7, I- 1i a/1						
	A)For column	104	0.93	0.93	2.25	202.39	
	B)For flooring and beam	1	111.20	12.10	1.22	1641.53	
						1843.92	
	Deduction						
	Column	94	0.93	0.93	1.22	99.19	
		6	0.465	0.93	1.22	3.17	
		4	0.465	0.465	1.22	1.06	
						103.41	
	Total (A + B) - Deduction		1843.92 - 103.41 =			1740.51	
	C)For Gutter	11	12.00	0.50	0.20	13.20	
	D)For Steps						
	South side	22	0.90	0.90	0.30	5.35	
	North side	22	0.90	0.90	0.30	5.35	
						10.69	
		Total (A + B) - Deduction) + C + D					
		= 1740.51 + 13.20 + 10.69				1764.41	1764.41
							Cu.Mt.
2	Providing dry/ trap/ granite/ quartzite/ gneiss rubble stone soiling 15 cm to 20 cm thick including hand packing and compacting						

S. N.	Description of Item	No.	Length	Width	Depth	Quantity	Total
	complete.						
	DSR 2014-15, P-12, 1-11/1						
	For column footing	104	0.93	0.93	0.23	20.69	
	For Beds	11	10.00	12.00	0.20	264.00	
	For Steps						
	South side	22	0.90	0.90	0.20	3.56	
	North side	22	0.90	0.90	0.20	3.56	
	For Outlet Chamber						
	Bed	11	0.95	0.78	0.20	1.63	
						293.45	293.45
							Cu.Mt.
3	Providing and laying in situ, cement concrete in M-10 of trap/ granite/ quartzite/ gneiss metal for foundation and bedding including bailing out water, formwork, compacting and curing complete,						
	DSR 2014-15, P-21, I - 1 a /4						
	For column footing	104	0.93	0.93	0.15	13.49	
	For Beds	11	10.00	12.00	0.10	132.00	
	For Steps	22	0.90	0.90	0.10	1.78	
		22	0.90	0.90	0.10	1.78	
	Below plinth beam						
	B1	11 x 2 x 2	3.07	0.23	0.07	2.17	
	B2	11 x 1 x 2	3.27	0.23	0.07	1.16	
	B3	11 x 2	2.77	0.23	0.07	0.98	
		2	2.77	0.23	0.07	0.089	
	B4	11 x 2	2.82	0.23	0.07	1.00	

S. N.	Description of Item	No.	Length	Width	Depth	Quantity	Total
		2	2.82	0.23	0.07	0.091	
						154.55	154.55
							Cu.Mt.
4	Providing and laying in situ cement concrete M-20 of trap / granite /quartzite/ gneiss metal for R.C.C. work in foundations like raft, strip foundations, grillage and footings of R.C.C. columns and steel stanchions etc.						
	DSR 2014-15,P-25, I -1Aa i / 5						
	For column footing	104	0.93	0.93	0.35	31.48	31.48
							Cu.Mt.
5	Providing and casting in situ cement concrete M-20 of trap / granite /quartzite/ gneiss metal for R.C.C. columns as per detailed designs& drawing or as directed including centering, formwork, cover blocks compacting and roughening the surface if special finish is to be provided and curing complete.						
	DSR 2014-15,P-31,I -2 Aa i / 5						
	Up to Plinth Beam	104	0.23	0.23	0.30	1.65	
	Above Plinth Beam	104	0.23	0.23	1.82	10.01	
						11.66	11.66
							Cu.Mt.

S. N.	Description of Item	No.	Length	Width	Depth	Quantity	Total
6	Providing & casting in situ cement concrete M-20 of trap / granite /quartzite/ gneiss metal for R.C.C. beams and lintels as per detailed designs & drawings as directed including centering, cover blocks compaction & roughening the surface if special finish is to be provided & curing complete.						
	DSR2014-15,P-36, I -3 Aa i / 5						
	Plinth beam						
	B1	11 x 2 x 2	3.07	0.23	0.23	7.15	
	B2	11 x 1 x 2	3.27	0.23	0.23	3.81	
	B3	11 x 2	2.77	0.23	0.23	3.22	
		2	2.77	0.23	0.23	0.293	
	B4	11 x 2	2.82	0.23	0.23	3.28	
		2	2.82	0.23	0.23	0.298	
						18.05	18.05
							Cu.Mt.

S. N.	Description of Item	No.	Length	Width	Depth	Quantity	Total
7	Providing and casting in situ cement concrete in M-20 of trap/ granite/ quartzite/ gneiss metal for R.C.C. pardi 75mm thick fins including centering, formwork, cover blocks compacting&roughening them if special finish is to be provided and curing complete. (Excluding reinforcement).with reversible Drum Type mixer with SCADA With natural sand.						
	DSR 2014-15, P- 48, I - 6 A a i / 5						
	B1	11 x 2 x 2	3.07	0.10	1.59	21.48	
	B2	11 x1 x 2	3.27	0.10	1.59	11.44	
	B3	11 x 2	2.77	0.10	1.59	9.69	
		2	2.77	0.10	1.59	0.881	
	B4	11 x 2	2.82	0.10	1.59	9.86	
		2	2.82	0.10	1.59	0.897	
	For Outlet Chamber						
	Bed	11	0.95	0.78	0.10	0.815	
	Side walls	11 x 2	0.70	0.10	1.70	2.62	
		11 x 1	0.60	0.10	1.70	1.12	
	For Splash tray						
		11	0.50	0.50	0.10	0.28	
						59.08	59.08
							Cu.Mt.

S. N.	Description of Item	No.	Length	Width	Depth	Quantity	Total
8	Providing and fixing in position TMT-FE 500reinforcement of various dimeters for R.C.C. pile caps, footings, foundations, slabs, beams, columns, conopies, staircase, newels, chajjas, lintels pardis, copings,fins, arches etc . as per detailed designs and drawing and schedules.including cutting, bending, hooking the bars, binding required complete.						
	DSR 2014-15 , P - 51, I -8 /5						
			Qty	Weight			
	i) Footing		31.48	70.00	Kg/Cum	2203.77	
	ii) Column		11.66	120.00	Kg/Cum	1399.61	
	iii) Beam & Lintel		18.05	120.00	Kg/Cum	2165.81	
	iv) Pardi		59.08	60.00	Kg/Cum	3544.66	
	v) M15 for bedding		158.19	25.00	Kg/Cum	3954.76	
						13268.61	KG
						13.269	**13.269**
							M.T
9	Providing and casting in situ cement concrete M-15 of trap / granite /quartzite/ gneiss metal for bed blocks, foundation blocks and such other items including bailing out water formwork, curing						

S. N.	Description of Item	No.	Length	Width	Depth	Quantity	Total
	and finishing if required complete,						
	DSR2014-15 P -22,I -3 i a /4						
	A)For Bed	11	10.00	12.00	0.12	158.40	
	Deduction						
	Column	11x 2 x 2	0.230	0.07	0.12	0.08	
		10 x 2	0.065	0.065	0.12	0.01	
		3 x 2	0.065	0.23	0.12	0.01	
		10 x 3 x 2	0.065	0.23	0.12	0.11	
		4	0.065	0.065	0.12	0.00	
						0.21	
	Total (A) - Deduction		158.40 - 0.21 =			**158.19**	
	B)For Steps	22	0.90	0.30	0.07	0.42	
		22	0.90	0.30	0.07	0.42	
						0.83	
	C)For Outlet Chamber						
	Bed	11	0.95	0.78	0.10	**0.82**	
		Total (A - Deduction) + B + C					
		= 158.19 + 0.83 + 0.82				159.84	159.84
							Cu.Mt.
10	Providing uncoursed rubble masonry of trap / granite / quartzite / gneiss stones in cement mortar 1:6 in foundation and plinth of inner walls / in plinth watering						

S. N.	Description of Item	No.	Length	Width	Depth	Quantity	Total
	complete. Spec. No.: Bd.H.1 Page No. 329						
	DSR 2014-15, P- 75, I- 1 / 7						
	North	22	0.90	0.90	0.20	3.56	
		22	0.90	0.60	0.20	2.38	
		22	0.90	0.30	0.20	1.19	
	South	22	0.90	0.90	0.20	3.56	
		22	0.90	0.60	0.20	2.38	
		22	0.90	0.30	0.20	1.19	
						14.26	14.26
							Cu.Mt.
11	Providing internal cement plaster 12mm thick in single coat in cement mortar 1:3 with fine cement finish to concrete or brick surfaces, in all position including scaffolding and curing complete. Spec. No.: Bd.L.2 Page No. 368						
	DSR 2014-15, P-85, I-2 c/ 11						
	Top of Steps	22 x 3	0.90	0.30		17.82	
		22 x 3	0.90	0.30		17.82	
	For Outlet Chamber						
		11	0.60	0.60		3.96	
						39.60	39.60
							Sq.Mt.

S. N.	Description of Item	No.	Length	Width	Depth	Quantity	Total
12	Providing flush grooving pointing with cement mortar 1:3 for _ including scaffolding and curing complete.b)stone masonry work						
	DSR 2014-15,P - 87, I -9) b)						
	For Steps south	2	22.00	0.90	0.20	7.92	
		2	22.00	0.60	0.20	5.28	
		2	22.00	0.30	0.20	2.64	
	For Steps North	2	22.00	0.90	0.20	7.92	
		2	22.00	0.60	0.20	5.28	
		2	22.00	0.30	0.20	2.64	
						31.68	31.68
							Sq.Mt.
13	Providing and applying 2 coats of water proof cement paint of approved manufacture and of approved colour to the plastered surfaces including scaffolding if necessary, watering for 2 days complete.						
	DSR 2014-15, P-109, I-9/14						
		2	111.20	0.60		133.44	
		2	12.10	0.60		14.52	
		2	111.20	0.10		22.24	
		2	12.10	0.10		2.42	
	Side of Steps						
	North side	11 x 2	0.90		0.20	3.96	
		11 x 2	0.60		0.20	2.64	
		11 x 2	0.30		0.20	1.32	

S. N.	Description of Item	No.	Length	Width	Depth	Quantity	Total
	South side						
		11 x 2	0.90		0.20	3.96	
		11 x 2	0.60		0.20	2.64	
		11 x 2	0.30		0.20	1.32	
	For Outlet Chamber						
	South side	11 x 2	0.70		0.60	9.24	
		11 x 1	0.80		0.60	5.28	
						202.98	202.98
							Sq.Mt.
14	Supplying and laying fine sand (Size 0.2 mm to 0.6 mm)at site of work including loading, unloading and transporting lead 70 km etc.						
	DSR 2014-15, P- 402, I-14 DSR Refference - 14 A/239						
		22	10.00	12.00	0.10	264.00	264.00
							Cu.Mt.
15	Supplying and laying Gravel (Size 7 mm to 15 mm) at site of work including loading, unloading and transporting lead 70 km etc.						
	DSR 2014-15, P- 402, I-14 DSR Refference - 14 A/239						
		11	10.00	12.00	0.10	132.00	132.00
							Cu.Mt.

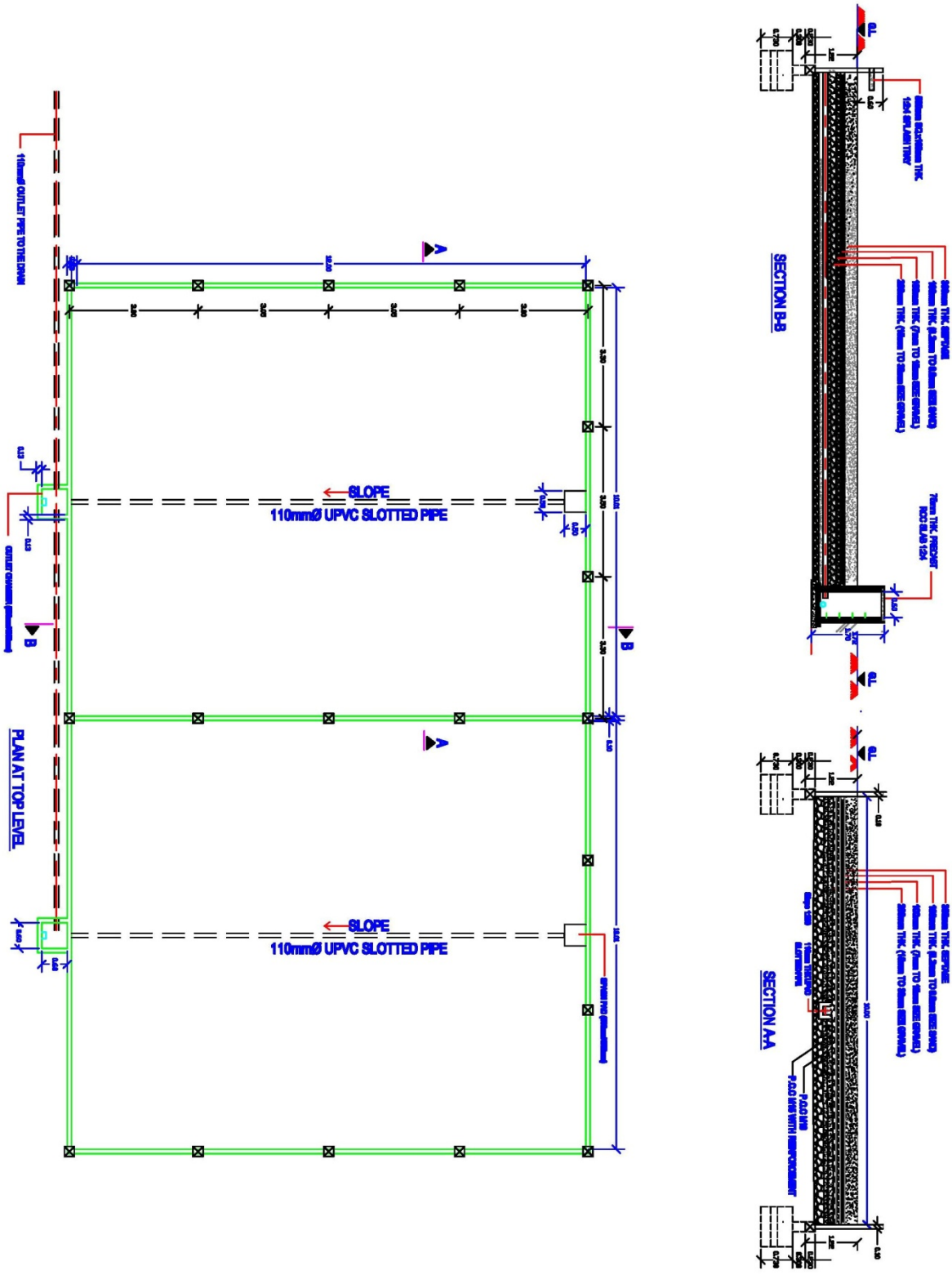
S. N.	Description of Item	No.	Length	Width	Depth	Quantity	Total
16	Supplying and laying Gravel (Size 15 mm to 30 mm)at site of work including loading, unloading and transporting lead 70 km etc.						
	DSR 2014-15, P- 402, I-14 DSR Refference - 14 A/239						
		22	10.00	12.00	0.20	528.00	528.00
							Cu.Mt.
17	Providing and Laying Slotted P.V.C.pipe 110mm dia. 4kg. pressure (class II)						
	DSR 2014-15, P- 390, I-214 DSR Refference - 190/261						
		11	12.00			132.00	132.00
							RMT
18	Transport to excavated upto a lead of 1.0 km including loading,unloading etc.complete.						
	DSR 2014-15, P-426						
		Qty as item no 1				1764.41	1764.41
							Cu.Mt.
19	Providing R.C.C Chamber cover with frame 90cm*45cm medium duty 140kg						
	DSR 2014-15, P-396, i-Bd-v- 346 DSR reference317a ii/266						
	For outlet chambers						
	South						

S. N.	Description of Item	No.	Length	Width	Depth	Quantity	Total
		11				11.00	11.00
							NO

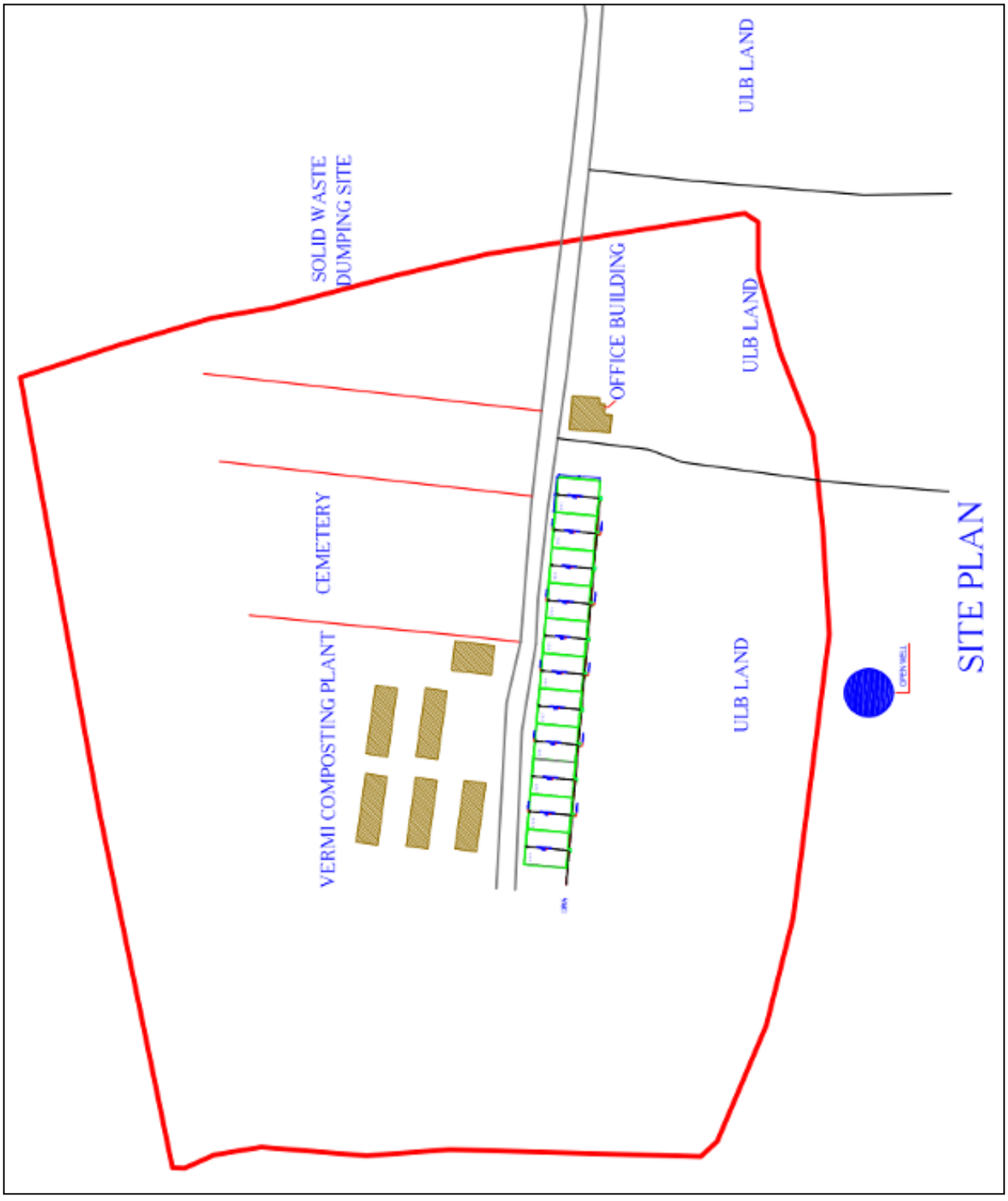
Chief Officer
Wai Municipal Council, Wai

DRAWING

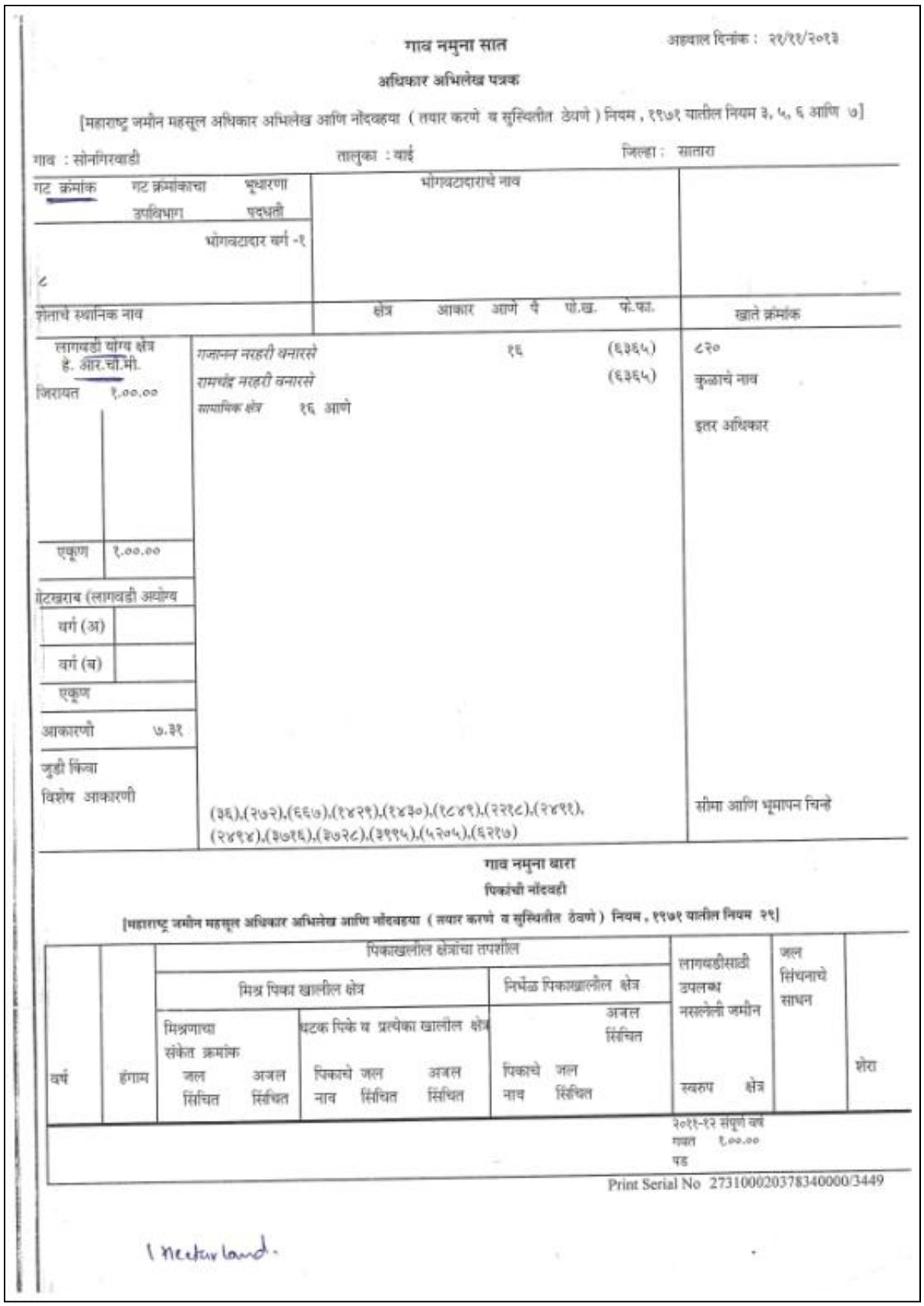
Drawing for Sludge drying bed:



Site Plan for Sludge Drying Bed



Details of land availability for Septage treatment Plant



गाव नमुना सात

अहवाल दिनांक : २१/११/२०१३

अधिकार अभिलेख पत्रक

[महाराष्ट्र जमीन महसूल अधिकार अभिलेख आणि नोंदवहया (तयार करणे व सुस्थितीत ठेवणे) नियम , १९७१ यातील नियम ३, ५, ६ आणि ७]

गाव : सोनगिरवाडी तालुका : वाई जिल्हा : सातारा

गट क्रमांक	गट क्रमांकाचा उपविभाग	भूधारणा पद्धती	भोगवटादाराचे नाव
८		भोगवटादार वर्ग -१	

क्षेत्राचे स्थानिक नाव	क्षेत्र आकार आणे पै	पो.ख.	पो.फा.	खाते क्रमांक
लागवडी योग्य क्षेत्र हे. आर.चौ.मी.	गजानन नरहरी वनारसे	१६	(६३६५)	८२०
जिरायत १.००.००	रामचंद्र नरहरी वनारसे		(६३६५)	कुळाचे नाव
	सामायिक क्षेत्र १६ आणे			इतर अधिकार
एकूण १.००.००				
पोटखराब (लागवडी अयोग्य				
वर्ग (अ)				
वर्ग (ब)				
एकूण				
आकारणी ७.३१				
जुडी किंवा विशेष आकारणी	(३६),(२७२),(६६७),(१४२९),(१४३०),(१८४९),(२२१८),(२४९१), (२४९४),(३७१६),(३७२८),(३९९५),(५२०५),(६२१७)			सीमा आणि भूमापन चिन्हे

गाव नमुना बारा

पिकांची नोंदवही

[महाराष्ट्र जमीन महसूल अधिकार अभिलेख आणि नोंदवहया (तयार करणे व सुस्थितीत ठेवणे) नियम , १९७१ यातील नियम २९]

वर्ष	हंगाम	पिकाखालील क्षेत्रांचा तपशील				लागवडीसाठी उपलब्ध नसलेली जमीन		जल सिंचनाचे साधन	शेरा
		मिश्र पिका खालील क्षेत्र		निर्भेळ पिकाखालील क्षेत्र					
		मिश्रणाचा संकेत क्रमांक	घटक पिके व प्रत्येका खालील क्षेत्र		अजल सिंचित	स्वरुप	क्षेत्र		
		जल सिंचित अजल सिंचित	पिकाचे नाव जल सिंचित अजल सिंचित	पिकाचे नाव	जल सिंचित				
						२०११-१२ संपूर्ण वर्ष गवत १.००.०० पड			

Print Serial No 27310002037834000O/3449

1 Neeta land.