

# **Suggested improvements to existing decanting station at Anna stadium Trichy**

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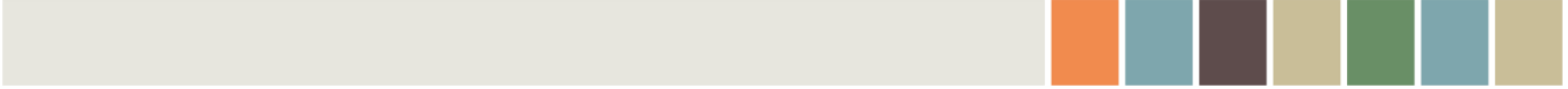
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## **ABBREVIATIONS**

FS	Fecal Sludge
GoTN	Government of Tamil Nadu
MLD	Million Liters per Day
O&M	Operations and Maintenance
PPE	Personal Protective Equipment
STP	Sewage Treatment Plant
TCC	Trichy City Corporation
TNUSSP	Tamil Nadu Urban Sanitation Support Programme
UGSS	Underground Sewer System

## 1 INTRODUCTION

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Fecal sludge (FS, also referred to as Septage) emptied from septic tanks or pits can be safely disposed and treated either at an independent fecal sludge treatment plant (FSTP) or co-treated with sewage at a Sewage Treatment Plant (STP). Co-treatment of FS in STPs depends on many factors, including the characteristics of FS and capacity and performance of STP. Co-treating FS at an STP requires a proper septage receiving facility, located either at the STP or at intermediate points in the city to connect to the sewer network so that FS is safely conveyed through the system and does not hinder, or overload the network or processes in the STP.

Septage receiving station or a decanting station (term used in this document) provide arrangements for discharge of septage into the Underground Sewer System (UGSS). It also functions as a pre-treatment facility for the FS

The Government of Tamil Nadu has issued the Operative Guidelines on Septage Management in 2014. As per the Guidelines, the urban local bodies, if does not have an independent fecal sludge treatment plant, can utilize the existing residual capacity of the STP to co treat the FS.

Trichy City Corporation (TCC), has started practicing co treatment even before the Operative Guidelines were issued. Three sewage pumping stations were designated as decanting stations in the year 2012, the most recent decanting station started functioning in the year 2017. Thus, four decanting stations cover the four administrative zones in TCC, one being in each zone.

An assessment of these decanting facilities was carried out to understand the infrastructure and operation and maintenance practices. This note summarizes the recommendations on layout, infrastructure, operation and maintenance practices and administration for the decanting station at Anna stadium, Trichy.

## 2 SUMMARY OF ISSUES

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- Field observations and status of the preliminary treatment units at each of the decanting facilities is summarised in Table 1.
- Decanting stations are provided with screens and grit removal units. However, removal of screenings and grit are not frequent.
- No measures to control or manage the spillage.
- No control or record of the origin of septage. For example, grease and industrial effluents can be discharged to the collection well with no control.
- Record of the number of trucks is maintained, but volume of trucks and septage discharged is not recorded, thereby making accurate assessments on the volume of septage received difficult.
- Health and hygiene. There are no proper hand wash facilities for drivers, no Personal Protective Equipment (PPE) for workers.
- No procedure for sampling and analysis of suspect loads

Table 1: Status of the preliminary treatment units in decanting station at Anna stadium

<b>Decanting station</b>	<b>Provision for disposing FS</b>	<b>Screen Chamber</b>	<b>Grit chamber</b>
Anna Stadium	A small inlet chamber was constructed, but at present it is not functional. FS is directly disposed into the collection well	The screen does not seem to be functioning. One of the reasons being, they are placed vertically. Vertical placing of screens will be difficult for manually cleaning the screenings	Grit Chamber works on simple gravity separation. Grit removal system is not functional. Grit pumps are not working.

### 3 RECOMMENDATIONS

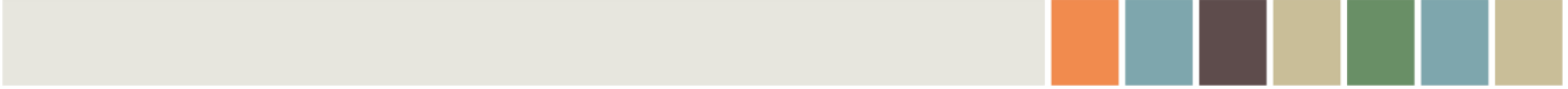
#### 3.1. LAYOUT AND INFRASTRUCTURAL RECOMMENDATIONS

1. Spillage Management
  - a. An unloading ramp for the septage trucks, sloped to drain to allow ready cleaning of any spillage and washing of the tank, connector hoses, and fittings. The ramp drainage must drain to the decanting station treatment units (collection well) and shall exclude excessive storm water. (Details are mentioned in Annexure 1)
  - b. A flexible hose with different sets of diameter depending the truck outlet, fitted with easy connect coupling to provide for direct connection from the septage truck outlet to minimize spillage and help control odours
  - c. Wash water with ample pressure, hose, and spray nozzle for convenient cleaning of the receiving station and trucks.
2. Sanitary requirements:
  - a. Provision of washing facility
  - b. Renovation of Toilet- 1 No.
  - c. Provision of drinking water fountain/dispenser- 1 no.
3. Renovation of existing screen and grit chamber

#### 3.2. OPERATION AND MAINTENANCE RECOMMENDATIONS

1. Laboratory and staffing capability to determine the septage strength and/or toxicity to the treatment processes: The manifest system will help to identify the origin of the load. If suspect, operators should follow the procedure
  - Fill a 2-liter container from the truck
  - Observe it for odour of hydrocarbons or other chemicals
  - Observe it for high concentrations of grease, check the pH using litmus paper, which should be between 6 - 9. If hydrocarbons, grease or high or low pH is found, the load should not be accepted. If none is found, the load can be discharged.

This procedure will require training to the operators to implement.
2. Always wash hands immediately with soap after contacting septage or tools and equipment that may have contacted septage, and always before eating or drinking.
3. Septage workers should be immunized for tetanus, hepatitis A, and hepatitis B.
4. Never smoke while operating septage equipment. Septic tanks may generate methane, an explosive gas. Smoking also promotes the hand to mouth route of infection.
5. Night hour monitoring and recording should be established.

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6. Personal protective equipment (PPE) – All employees are responsible for maintaining their personal protective equipment in good condition. Basic protective equipment include: gloves, boots, hard hat and face mask

### **3.3. ADMINISTRATIVE RECOMMENDATIONS**

Information for recordkeeping may include, but are not limited to, the following:

1. Pumping activity and volume
2. Filled out manifest forms.
3. Inventory of tools
4. Daily tallies of septage discharged at the decanting station



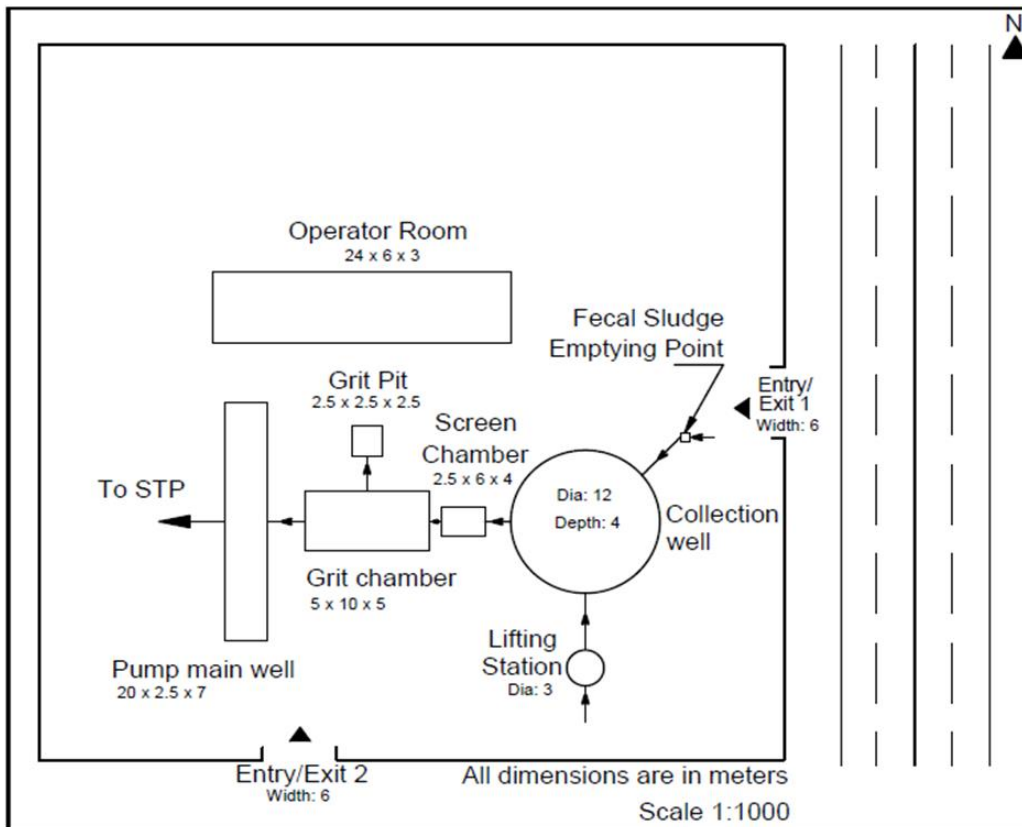
## ANNEXURE 1

### **Proposed Recommendation: A ramp to contain Spillage**

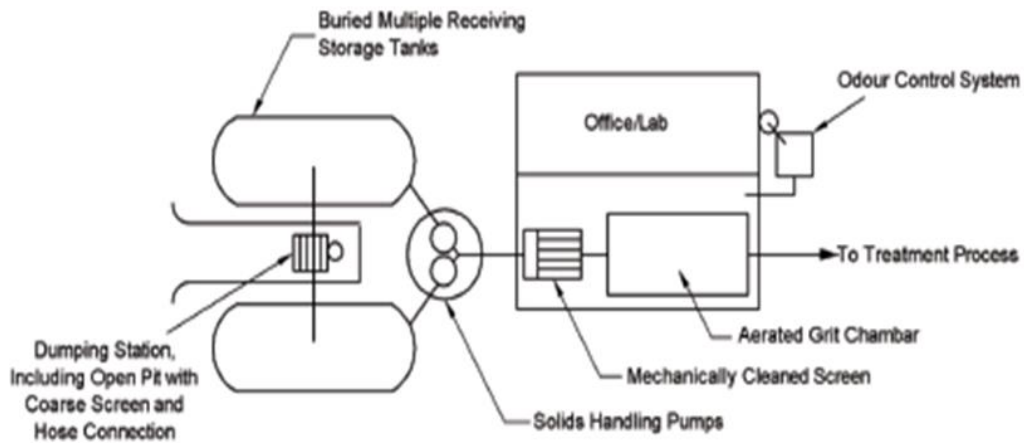
An unloading ramp/platform has been proposed for the trucks to empty their FS into the collection well, so that the spillage from the trucks can be managed and controlled. Construction activities shall be planned during night hours such that the routine operational activities of the pumping/decanting station does not get affected. The existing layout of the decanting station at Anna stadium Trichy is shown in figure 1. As compared with the CPHEEO manual layout of the decanting station (shown in figure 2, which summarises the key facilities required of decanting station: receiving tank, storage tank, screen chamber, aerated grit chamber), the decanting station at Anna stadium Trichy has the existing infrastructure of collection well, screening and grit removal system. Figure 3 shows the layout after the suggested improvement of installation of ramp

Proposed ramp consist of a platform, drainage and wash facilities. The area where ramp proposed requires excavation upto 0.35 m depth. As the ramp will have an average no. of 80 trucks, to sustain the moving loads, foundation shall be made with wet mix and PCC. Ramp platform shall be made with RCC since it will have longer life than PCC. Onto to the sides of the ramp, platform is built in inverse slope to the ground so that it is easy for the vehicles to move and turn. Ramp shall have expansion joint with appropriate sealant filled to avoid the development of cracks due to seasonal change in temperature. Ramp drainage shall have a slope of 1 in 100 so that the wash water can drain easily to the channel provided. The channel is built with manholes (0.3 x 0.3 x 0.6 m) connected by pipes of dia 0.15 m. A wash area shall be built for the truck operators to use after emptying with provision of hand shower. The platform will have a wash facility to clean out the spillage. The public tap (which has 24/7 water supply) at the front area can pump to a Syntex tank placed over the porch area, so that the water can be used as wash water. Detailed cost estimate is attached in Annexure 2.

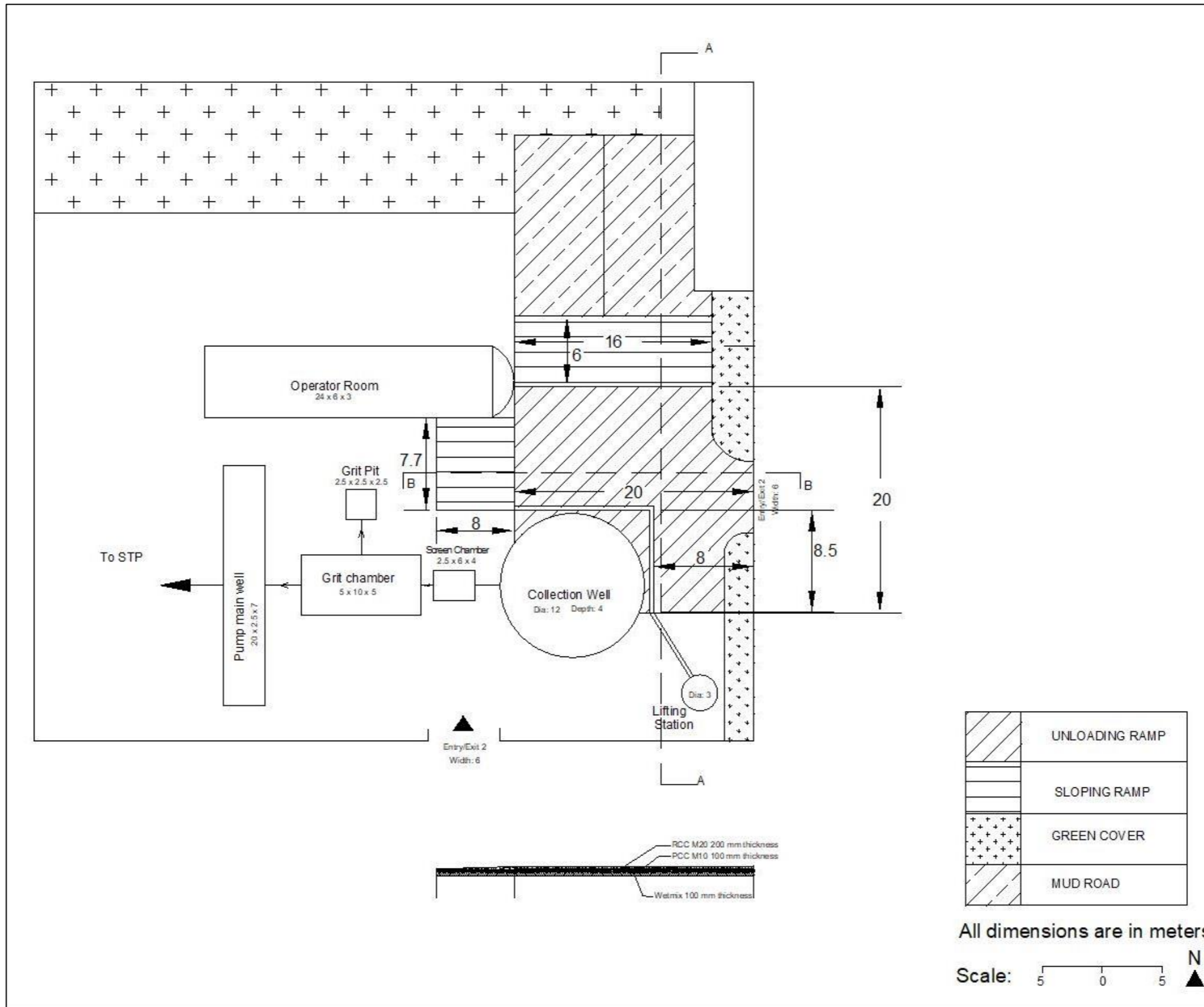
In addition to the above recommendation, toilet revamping shall be planned with additional new fixtures. The wastewater shall be connected to the collection well itself.



**Figure 1: Anna stadium decanting station Layout**



**Figure 2: Layout of decanting station –CPHEEO**



**Figure 3: Layout of Anan stadium layout-with suggested improvements**

## ANNEXURE 2-COST ESTIMATE

Abstract sheet of Rigid Pavement					
Sl. no	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
<b>A</b>	<b>Earthwork- Excavation</b>				
	Ordinary soil earth work excavating and depositing on bank with an initial lead of and initial lift of 2m in Sand ,silt or other loose soil ,wet sand or silt not under water ,light black cotton soil sandy loam and ordinary soil including excavated earth. Requires braking, ramming and sectioning of soil bank for which separate rate will not paid.				
	Total earthwork excavation	cum	140.91	50	7,045.50
<b>B</b>	<b>WET MIX MACADAM</b>				
	Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the material with water at OMC in mechanical mix plant carriage of mixed material by tipper to site. Laying in uniform layers with paver in sub- base / base course on well prepared surface and compacting with vibratory roller (12 tonne) to achieve the desired density.				
	Total	Cum	40.26	1800	72,468.00
<b>C</b>	<b>Plain cement concrete</b>				
	Providing and laying plain cement concrete of grade M10 in binding layer under R.C Platform of ground level with coarse aggregate of 40mm including cost and conveyance of all materials at site, including all labour charges, batching, mixing, placing, vibrating, curing, formwork etc., complete complying with standard specification and as directed by the Engineer.				
		Cum	40.26	4500	181,170.00

Abstract sheet of Rigid Pavement					
Sl. no	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
<b>E</b>	<b>RCC Base Coarse M20</b>				
	Providing and laying Reinforced Cement Concrete M20 (1:1.5:3). All reinforced cement concrete slab works using 20mm ISS gauge hard broken granite stone metal including cost and conveyance of all materials at site, including all labour charges, batching, mixing, placing, vibrating, curing, formwork etc., complete complying with standard specification and as directed by the Engineer.	Cum	80.52	6000	483,120.00
	RCC Platform 200mm thick with RCC M20 Grade of 12mm dia steel road, spacing of 125mm C/C both ways. Supplying, fabricating and placing in position TMT bars (Fe 500) for all RCC works as per design given including cost of steel and G.I. binding wire for placing at all depths of excavation, complete complying with standard specification. (Contractor has to make his own arrangements for the supply of steel, binding wire and for bar bending)	MT	8.00	52000	416,000.00
<b>F</b>	<b>Manhole (0.3x0.3x0.6)</b>				
		Nos	10.00	1200	12,000.00
<b>G</b>	Supply of 160mm dia. PVC 6KSC pipe of approved quality as per IS:4985-2000, including all cost of materials, transportation charges and other conveyance etc. complete as per standard specification and as directed	Rmt	30	1200	36,000.00

<b>Abstract sheet of Rigid Pavement</b>					
<b>Sl. no</b>	<b>Description</b>	<b>Unit</b>	<b>Quantity</b>	<b>Rate (Rs.)</b>	<b>Amount (Rs.)</b>
	by the Engineer. (With Excise Duty)				
<b>H</b>	Syntex tank 1500 liters	Nos	1	14000	14,000.00
<b>I</b>	Domestic water pump 1 HP	Nos	1	6000	6,000.00
<b>J</b>	Plumping arrangement hose pipe,tap,etc.	LS		2500	2,500.00
<b>TOTAL (Rs.)</b>					<b>12,30,303.5</b>